

3.0 TRANSPORTATION ANALYSIS

This chapter of the SEIS/SEIR describes the existing transportation conditions in the Study Area and evaluates the potential environmental operational and cumulative impacts of each of the four Central Subway alternatives as described in Chapter 2.0. Mitigation measures that would reduce or avoid operational environmental impacts are also described. See Chapters 4.0 and 5.0 for a description of existing conditions and impacts associated with all other environmental categories. All construction impacts and mitigation measures are summarized in Chapter 6.0, Construction. See Chapter 7.0 for the CEQA determinations of significance for all environmental categories.

Consistent with CEQA, the San Francisco Planning Department considers mitigation measures when necessary and feasible in order to reduce or eliminate potentially significant environmental effects. Improvement measures may be recommended to further minimize the affects of impacts that are less-than-significant. Under NEPA and FTA procedures, mitigation measures may be recommended to address project-related adverse effects even if impacts would not necessarily be considered significant.¹ This section identifies mitigation measures intended to reduce Project impacts to comply with both CEQA and NEPA requirements. For CEQA purposes, Chapter 7.0 provides further distinction between mitigation and improvement measures.

3.1 AFFECTED ENVIRONMENT

This section describes existing transit, traffic, freight, parking, non-motorized transportation, and emergency access conditions in the Central Subway Corridor (Corridor). For the purposes of transportation data collection and analysis, the Study Area is identified as the area generally within a two block radius of the Corridor, unless otherwise defined below. The Study Area would be bounded by the Mission Creek Channel to the south, Second and Montgomery Streets to the east, Columbus Avenue to the north, and Sixth and Taylor Streets to the west.

3.1.1 TRANSIT

This section provides a discussion of the existing local and regional transit systems serving the Central Subway.

¹ Council on Environmental Quality, Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Federal Register, 18026, 1981.

Existing Muni Transit System

UTransit System

Muni provides 20-hour a day (5 a.m. to 1 a.m.), daily access to most locations within San Francisco with 24-hour a day daily service on 10 key trunk corridors. All of the 79 transit lines, except one which operates only weekends, operate seven days a week. Muni operates four modes of vehicles: diesel bus, trolley bus, rail (light rail vehicles/historic streetcars), and cable cars. Equipment demand by mode is shown in Table 3-1. In addition, Muni provides paratransit service by contract. The system carries approximately 216 million riders annually.

TABLE 3-1
2007 MUNI EQUIPMENT DEMAND BY MODE

	AM Peak Vehicle Demand	Revenue Vehicle Fleet ²
Diesel Bus	377	495
Trolley Bus	225	333
Light Rail Vehicles (LRVs)	118	151
Historic Street Cars	17	26
Cable Cars ¹	26	40
Total	763	1,045

¹ Midday peak.

² Plus an addition 45 diesel buses that compose a reserve fleet.

Although the Muni route network is a modified grid that allows multi-destinational travel, approximately two-thirds of the 79 Muni routes are radial lines that travel from the neighborhoods to Downtown San Francisco. This includes 36 local and 16 express lines. In addition there are 13 cross-town lines that run north-south, east-west, or circumferential and 12 community service lines that fill in the gaps or serve areas of steep topography within the City. Also included are two special owl service routes (90, 91) that operate between the hours of 1 a.m. and 5 a.m. Late night service is also provided by eight regular routes on the L, N, 5, 14, 22, 24, 38, and 108 lines.

Transit service from the southern end of the Third Street Corridor to Downtown is provided by the new T-Third line. Including late night (Owl) bus service, transit along Third Street operates 24 hours a day. See Table 3-2 for a guide to hours of operation and frequency of transit service along the Third Street Light Rail Corridor. The new T-Third light rail line is an extension of the K-Ingleside line, which transitions from the K-Ingleside line to the T-Third line at the West Portal Station for inbound trains and

TABLE 3-2
GUIDE TO FREQUENCY OF SERVICE (AVERAGE TIME IN MINUTES)

ROUTE NAME ¹	WEEK-DAY First	WEEK-DAY 7-9 a.m.	WEEK-DAY 9 a.m. - 4 p.m.	WEEK-DAY 4-6 p.m.	WEEK-DAY Eve	WEEK-DAY Last	SAT UR-DAY First	SATUR -DAY 7-10 a.m.	SATUR-DAY 10 a.m. - 6 p.m.	SAT UR-DAY Eve	SAT UR-DAY Last	SUN-DAY First	SUN-DAY 7-10 a.m.	SUNDAY 10 a.m. – 6 p.m.	SUNDAY Eve	SUNDAY Last
T-Third ⁴ (LRT)	5:28	9	10	9	12-20	11:54 p.m.	5:28	10	10	12-20	11:54 p.m.	5:28	10	10	12-20	11:54 p.m.
J-Church (LRT)	5:09	8	10	12	20	12:30 a.m.	5:36 a.m.	12	12	15-20	12:16 a.m.	5:36 a.m.	15	15	20	12:16 a.m.
K-Ingleside (LRT)	5:09	10	12	10	12-20	12:30 a.m.	4:47 a.m.	12	12	15-20	12:16 a.m.	4:47 a.m.	15	15	20	12:16 a.m.
L-Taraval (LRT)	Owl	7	10	7	12-20	Owl	Owl	10	10	15-20	Owl	Owl	12	12	15-20	Owl
M-Oceanview (LRT)	5:42	9	12	9	12-20	12:30 a.m.	5:35 a.m.	12	12	15-20	12:11 a.m.	5:35 a.m.	15	15	20	12:11 a.m.
N-Judah (LRT)	Owl	7	10	7	12-20	Owl	Owl	10	10	15-20	Owl	Owl	10	10	15-20	Owl
1-California (trolley bus)	5:22	3	6	3	15	1:25 a.m.	5:25 a.m.	15	6	30	1:20 a.m.	5:25 a.m.	15	6	30	1:20 a.m.
2-Clement (diesel bus)	5:17	10	20	10	--	7:18 p.m.	5:07 a.m.	15	15	--	7:18 p.m.	5:07 a.m.	15	15	--	7:18 p.m.
3-Jackson (trolley bus)	7:06	10	20	10	20	1:05 a.m.	5:22 a.m.	15	15	20	1:22 a.m.	5:22 a.m.	15	15	20	1:22 a.m.
4-Sutter (trolley bus)	4:59	15	--	25	--	--	--	--	--	--	--	--	--	--	--	--
9-San Bruno (diesel bus)	5:35	10	10	8	15	12:18 a.m.	6:10 a.m.	12	12	20	11:55 a.m.	6:10 a.m.	12	12	20	11:55 a.m.
9X-Third Express ² (diesel bus)	7:07 a.m.	5	10	5	15	5:55 p.m.	9:31 a.m.	--	15	--	6:15 a.m.	9:31 a.m.	--	10	15-20	6:15 a.m.
9AX Third 'A' Express ³ (diesel bus)	6:43 a.m.	10	--	10	--	--	--	--	--	--	--	--	--	--	--	--
9BX Third 'B' Express ⁴ (diesel bus)	6:41 a.m.	10	--	10	--	--	--	--	--	--	--	--	--	--	--	--
10-Townsend (diesel bus)	5:47	10	20	10	30	7:02 p.m.	--	--	--	--	--	--	--	--	--	--
12-Folsom/Pacific	5:54	10	10	10	30	12:30 a.m.	6:00 a.m.	20	20	30	12:19 a.m.	6:00 a.m.	20	20	30	12:19 a.m.
20-Columbus	7:05	10-12	15	--	--	4:07 p.m.	--	--	--	--	--	--	--	--	--	--
30-Stockton long line ⁴ (trolley bus)	5:30 a.m.	9	9	9	12	1:06 a.m.	6:00 a.m.	10	6	12	1:06 a.m.	6:00 a.m.	10	6	12	1:06
30-Stockton short line ⁴	Owl	9	4-5	4-5	12	Owl	Owl	10	3-6	12	Owl	Owl	20	4-8	12	Owl

3.0 TRANSPORTATION ANALYSIS – AFFECTED ENVIRONMENT

ROUTE NAME ¹	WEEK-DAY First	WEEK-DAY 7-9 a.m.	WEEK-DAY 9 a.m. - 4 p.m.	WEEK-DAY 4-6 p.m.	WEEK-DAY Eve	WEEK-DAY Last	SAT UR-DAY First	SATUR-DAY 7-10 a.m.	SATUR-DAY 10 a.m. - 6 p.m.	SAT UR-DAY Eve	SAT UR-DAY Last	SUN-DAY First	SUN-DAY 7-10 a.m.	SUNDAY 10 a.m. – 6 p.m.	SUNDAY Eve	SUNDAY Last
(trolley bus)																
38-Geary (diesel bus)	5:14 a.m.	15	15	15	20	12:07 a.m.	5:14 a.m.	15	14	15	12:44 a.m.	5:14 a.m.	15	14	15	12:44 a.m.
38L-Geary Limited (diesel bus)	6:00 a.m.	7	7	7	--	5:52 p.m.	8:40 a.m.	7	7	--	5:39 p.m.	--	--	--	--	--
45 Union/Stockton (trolley bus)	6:10 a.m.	9	9	9	15	1:02 a.m.	6:10 a.m.	15	12	15	1:30 a.m.	6:10	20	12	12	1:30
47-Van Ness (trolley bus)	6:00 a.m.	8	9	8	20	1:06 a.m.	6:14 a.m.	9	9	20	1:19 a.m.	6:14 a.m.	9	9	20	1:19 a.m.
91-Owl ⁴ (diesel bus)	12:15 a.m.	--	--	--	30	4:15 a.m.	12:15 a.m.	--	--	30	4:15 a.m.	--	--	--	--	

¹ All bus lines operate fully accessible vehicles. All light rail vehicles (LRVs) are fully accessible; but the T-Third is the only fully accessible rail line because it has high level platforms on the surface. The other light rail lines are fully accessible in the Market Street Subway but are accessible only at key stops on the surface.

² Reverse-peak direction service.

³ Service operates peak-hour, peak-direction only.

⁴ Late night service provided by the 91-Owl.

Source: San Francisco Municipal Railway

transitions from the T-Third line to the K-Ingleside line at Ferry Plaza for outbound trains. It has been extended to operate as the T-Third via The Embarcadero, King, Fourth, Owens, and Third Streets and Bayshore Boulevard to a temporary terminal in the middle of Bayshore Boulevard, just south of Sunnydale Avenue. It will eventually connect directly to the Caltrain Bayshore Station that straddles the county line between the cities of San Francisco and Brisbane. Most of the operation is in semi-exclusive right-of-way. The exception is the nine-block section in the Bayview Commercial Core, which operates in a mixed-flow configuration to retain parking in support of business revitalization. There are 18 light rail surface stations, with 8 center and 10 side platforms. All platforms are high level and most extend the length of a block between two intersections. The T-Third line operates between 5 a.m. and 1 a.m. with daytime service frequencies of 9 minutes during peak periods.

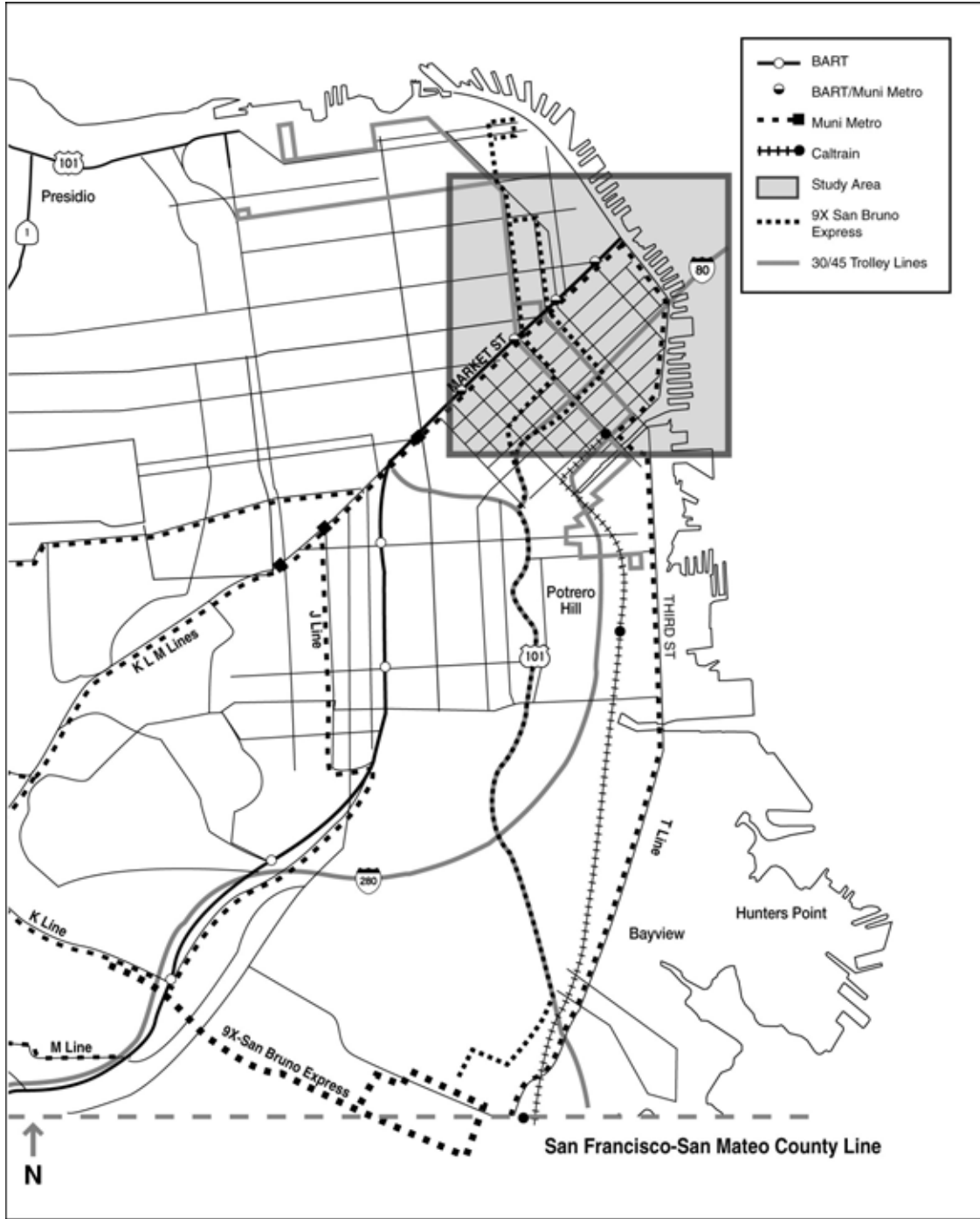
Bus System

A detailed description of the Corridor's six primary bus routes and their current available capacity is provided below (see Figure 3-1). Vehicle design capacities are derived from the size of the vehicle and include the number of sitting and standing passengers. According to Muni, for both standard electric trolley coaches and diesel motor coaches, the design capacity for planning purposes is 63 passengers per vehicle; for articulated buses, the design capacity is 94 passengers per vehicle; and for light rail vehicles, the design capacity is 119 passengers. In order to determine the amount of bus capacity used at the maximum load point (the point where passenger demand is the highest) for each line, the number of peak hour passengers at the maximum load point was divided by the bus capacity (the number of vehicles x the design capacity per vehicle) during the peak hours.²

9X-San Bruno Express. This line operates 20-hours per day on weekday and weekends. It connects Fisherman's Wharf, North Beach and Chinatown districts (Broadway and Kearny/Stockton Streets) to Visitacion Valley, the Excelsior district, and City College (Phelan Loop) via North Point and Powell Streets, Columbus Avenue, Stockton and Kearny Streets, Third and Fourth Streets, Highway 101, San Bruno Avenue, Bayshore Boulevard, Geneva Avenue, and Ocean Avenue to Phelan Avenue. This line provides service to the Powell and Montgomery BART/Muni Metro stations. During the a.m. peak hour, the maximum load point occurs at Stockton and Sutter Streets in the southbound (outbound) direction, with about 55 percent of the available capacity used. During the p.m. peak hour, the maximum load point occurs at the same location in the southbound (outbound) direction, with the bus line operating at over 58 percent of capacity. About 63 percent of the route's 8,100 daily boardings occur north of Highway 101.

² Passenger and number of vehicle information were based on Muni bus monitoring data for FY 05/06. Ridership data has not yet been collected for the service changes implemented in April 2007.

FIGURE 3-1
EXISTING MUNI ROUTES SERVING THE STUDY AREA



Source: PB Wong
 Not to scale

9AX-San Bruno 'A' Express. This line operates 20-hours per day weekdays and weekends. It connects the North Beach and Chinatown districts (Broadway and Stockton Street) to the Excelsior district (Geneva/Mission Streets) and City College (Phelan Loop) via Stockton and Kearny Streets, Third and Fourth Streets, Highway 101, San Bruno Avenue, Bayshore Boulevard, Geneva Avenue, and Ocean Avenue to Phelan Avenue. Like the 9X-San Bruno, this line provides service to the Powell and Montgomery BART/Muni Metro stations. During the a.m. peak hour, the maximum load point occurs at Bayshore Boulevard and Carroll Avenue, with the bus line operating at almost 117 percent of capacity. During the p.m. peak hour, the maximum load point occurs at Stockton and Sutter Streets, with the bus line operating at about 108 percent of capacity. About 57 percent of the route's 2,800 daily boardings occur north of Highway 101.

9BX-San Bruno 'B' Express. This line operates on the same weekday schedule (no weekend service) as the 9X and 9AX and operates along the same route as the 9X. During the a.m. peak hour, the maximum load point occurs at Bayshore Boulevard and Arleta Avenue, with the bus line operating at about 83 percent of capacity. It also operates at about 98 percent of capacity during the p.m. peak hour, when the maximum load point occurs at Stockton and Sutter Streets. About 62 percent of the route's 2,100 daily boardings occur north of Highway 101.

30-Stockton. This line connects the Marina district (Beach/Broderick Streets) to the Caltrain Terminal (Fourth/Townsend Streets) via Chestnut Street, North Point Street, Columbus Avenue, Stockton Street, and Fourth Street to Townsend Street. It provides service to the Montgomery and Powell BART/Muni Metro stations. During the a.m. peak hour, the maximum load point occurs at Stockton and Sutter Streets in the northbound (inbound) direction, with approximately 83 percent of the available capacity used. During the p.m. peak hour, the maximum load point occurs at the same location in the southbound (outbound) direction, with about 71 percent of the available capacity used. Daily boardings average about 27,100.

45-Union/Stockton. This line connects the Presidio (Lyon/Greenwich Streets) to the Caltrain Terminal (Fourth/Townsend Streets) via Union Street, Stockton Street, Fourth Street to Townsend Street. It provides service to the Montgomery and Powell BART/Muni Metro stations. During the a.m. peak hour, the maximum load point occurs at Stockton and Sutter Streets in the southbound (outbound) direction, with about 91 percent of the available capacity used. During the p.m. peak hour, the maximum load point also occurs at this location in the southbound (outbound) direction, with about 73 percent of the available capacity used. Daily boardings average about 12,700.

Other Muni routes serving the Study Area are summarized below. At the Caltrain Terminal, the 10-Townsend diesel bus line provides service east along Townsend Street to the Transbay Terminal and then north through the Financial District on Battery and Sansome Streets, continuing along The Embarcadero and North Point Street to a terminus at Van Ness Avenue. The 47-Van Ness trolley bus line connects the Caltrain Terminal to the west of Downtown along the Van Ness Avenue corridor, terminating at Van Ness Avenue and North Point Street near the 10-Townsend bus line terminus. The 12-Folsom/Pacific diesel bus line operates inbound on Folsom Street and outbound on Harrison Street to The Embarcadero, and then west to Pacific Heights via Broadway and Pacific and Jackson Streets. The 9-San Bruno operates on lower Market Street. The Market Street lines generally serve all of the BART/Muni Metro stations.

There are extensive Downtown connections to Muni surface bus operations and Muni Metro, and BART rail service. The 14-Mission and 14L–Mission Limited trolley bus lines and 14X–Mission Express diesel bus line operate along Mission Street. At Market Street there are nearly a dozen Muni bus lines that operate past Third and Fourth Streets, including the 2, 3, 4, 5, 6, 7, 16AX, 16BX, 21, 38, 71, and 71L lines. The F-Market provides surface rail connections between the Castro district and Downtown along Market Street. The BART/Muni Metro Montgomery and Powell Street Stations serve riders on the Market Street Subway near Third and Fourth Streets.

Union Square is served by the 38-Geary and 38L-Geary Limited diesel bus lines crossing Stockton Street inbound on O’Farrell to the Transbay Terminal and outbound on Geary Boulevard to the Richmond district. The 3-Jackson and 4-Sutter trolley bus lines and the 2-Clement diesel bus line cross Stockton Street inbound on Post Street and outbound on Sutter Street. The 2-Clement line continues to the Ferry Building. The 3-Jackson and 4-Sutter lines terminate near Market and Sansome Streets.

In Chinatown, the 1-California trolley bus line operates inbound to Market Street via Clay Street, and outbound to the Richmond district via Sacramento Street. As mentioned above, the 12-Folsom/Pacific line operates between South of Market, The Embarcadero and Chinatown via Broadway (inbound) and Pacific Street (outbound).

Light Rail System

Muni also operates the Muni Metro light rail system (refer to Figure 3-1). The light rail service has various types of operations: on-street in mixed traffic conditions, surface operations in semi-exclusive right-of-way, and exclusive subway. Most of the system operates on-street in mixed-flow conditions. The Metro system currently has five operating lines, all serving downtown San Francisco: the J-Church (from Balboa Park via Church Street), K-Ingleside (from Balboa Park via Ocean Avenue and West Portal

Avenue), L-Taraval (from San Francisco Zoo via Taraval Street), M-Ocean View (from Ocean View via 19th Avenue and West Portal Avenue), and N-Judah (from Great Highway via Judah Street). In addition, the Castro Shuttle operates in the subway between The Embarcadero and Castro stations during peak hours on 10-minute headways.

Muni started operation of an historic trolley line on Market Street in September 1995 and extended it in 1998. The F-Market historic streetcar line runs on the surface of Market Street, between Castro Street and Fisherman's Wharf, and operates using rehabilitated vintage PCC (President's Conference Committee) cars designed in the 1930s and historic street cars from systems around the world.

Muni Metro light rail lines provide weekday service generally between 5 a.m. and 1 a.m., 6 a.m. and 1 a.m. on Saturday and 8 a.m. and 1 a.m. on Sunday. Metro owl service (late-night surface bus operation) is offered for the L-Taraval and N-Judah lines. The J-Church route area is generally served by the 24-Divisadero and the surface portion of the K-Ingleside line is covered by the 91-Owl bus during the late-night hours when Muni Metro is not in operation.

The weekday Muni Metro and street car daily ridership for the 6 lines is about 128,100 boardings, including 16,100 for the F-Market, 18,700 for the J-Church, 15,300 for the K-Ingleside, 23,300 for the L-Taraval, 23,300 for the M-Ocean View, 31,400 for the N-Judah, and 24,000 for the T-Third line.³

Future Bus Service Changes

Muni's SRTP 2006-2025 lists three transit-related improvements that are planned for implementation in and near the Study Area. These include:

- Bus Rapid Transit (BRT) - The Geary Corridor is one of the identified areas for BRT implementation and initial planning work is underway.
- Transit Preferential Streets (TPS) Improvements - Areas identified for TPS are Stockton Street/Columbus Avenue and Market Street.
- Islais Creek Bus Maintenance and Storage Facility - the new bus maintenance facility at Indiana and Tulare Streets will replace the Kirkland Division.

³ Muni Draft Short Range Transit Plan, 2008-2027, Ridership for Fiscal Year 2006 and Muni estimates from July 2007 for the T-Third line.

Mission Bay

Muni is planning to extend trolley coach service to accommodate new ridership in Mission Bay as employment and residential development increase in that area (see Figure 3-2). The expected changes include:

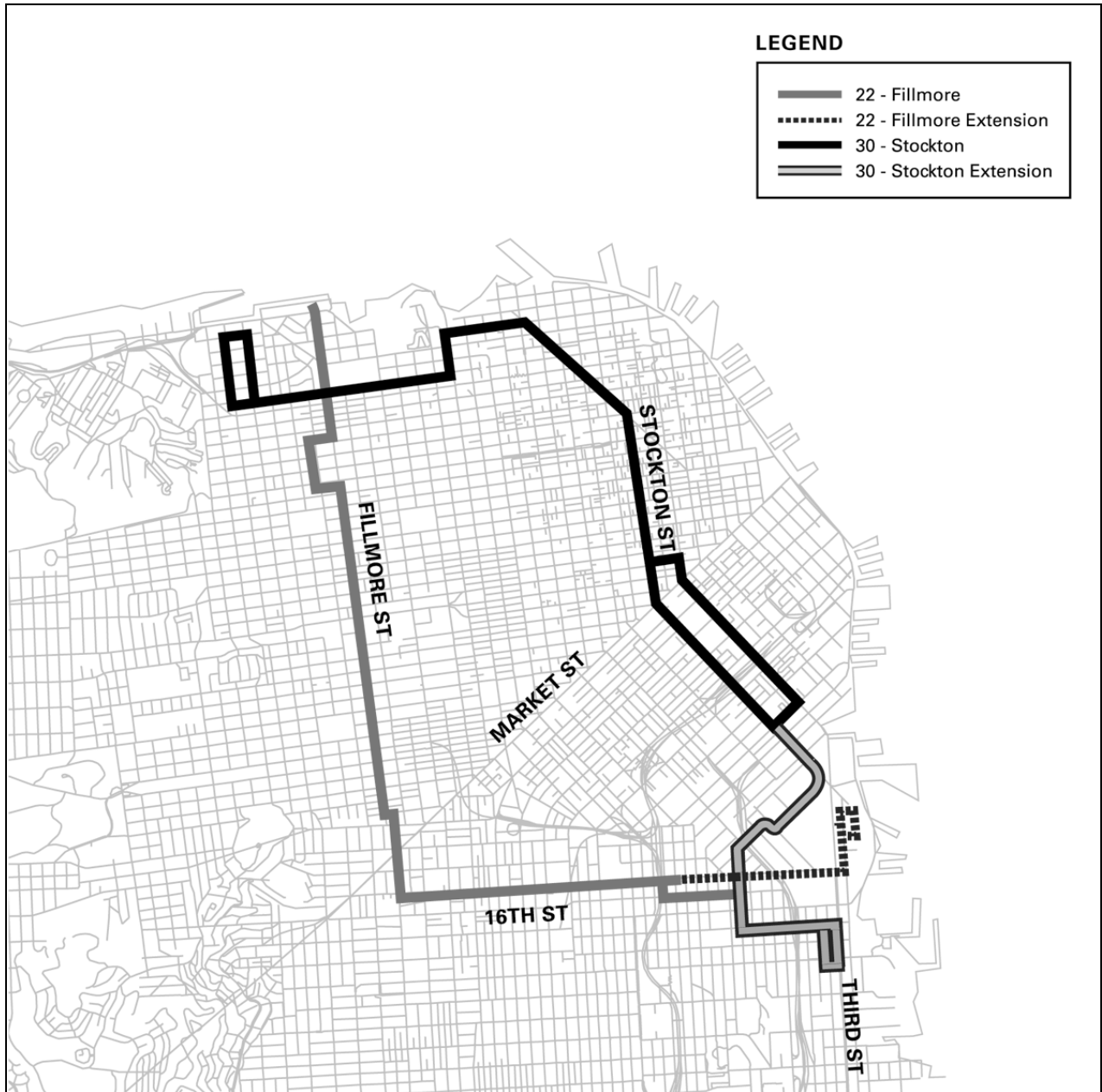
- Reroute the 22-Fillmore, which currently serves the Potrero Hill and Dogpatch neighborhoods, onto 16th Street, east of Kansas Street, to a terminal on Third Street in Mission Bay. As an interim measure, this extension to Third Street may be served by the 33-Stanyan. This service change requires overhead wires to be constructed on 16th Street between Kansas and Third Streets, and a terminal loop at Third Street. There are a number of safety concerns about the Caltrain grade crossing at 16th and Seventh Streets that must be resolved, before construction proceeds.
- Extend either the 30-Stockton or 45-Union/Stockton trolley coach line from its existing terminal at Fourth and Townsend Streets, through Mission Bay, and over a portion of the current 22-line on Potrero Hill to the existing 22-line terminal at Third and 20th Street. This service requires new street construction and identification of funding for overhead wires relocation and acquisition of additional vehicles in Mission Bay before it can be implemented.

Origin-Destination Analysis

In February and March of 2004, a transit on-board survey was performed to support the transit planning efforts of Muni and the San Francisco County Transportation Authority. Prior to the development of this survey, a 1976 citywide survey of Muni passenger characteristics and travel patterns and a 1996 survey of transit riders in the Third Street Corridor were used to support the initial estimates of Third Street Light Rail ridership. A primary goal of the survey was to more precisely understand the origins and destinations of Muni passengers systemwide.

The origins and destinations of riders of the 15-Third bus line were primarily located in the Bayview-Hunters Point neighborhood (23 percent), Chinatown/North Beach (18 percent), Crocker-Amazon/Visitacion Valley (15 percent), and South of Market (14 percent) (see Figure 3-3). The combined origins and destinations of riders all corridor routes, including the former 15-Third, 9AX/9BX-San Bruno Expresses, 30-Stockton, and 45-Union/Stockton indicate the greatest travel shares in Chinatown (26 percent), South of Market (16 percent), the Geary corridor (15 percent), and Crocker-Amazon/Visitacion Valley (12 percent). Only 11 percent of the origins and destinations were in the Financial District/Civic Center areas

FIGURE 3-2
PROPOSED MISSION BAY ROUTE CHANGES

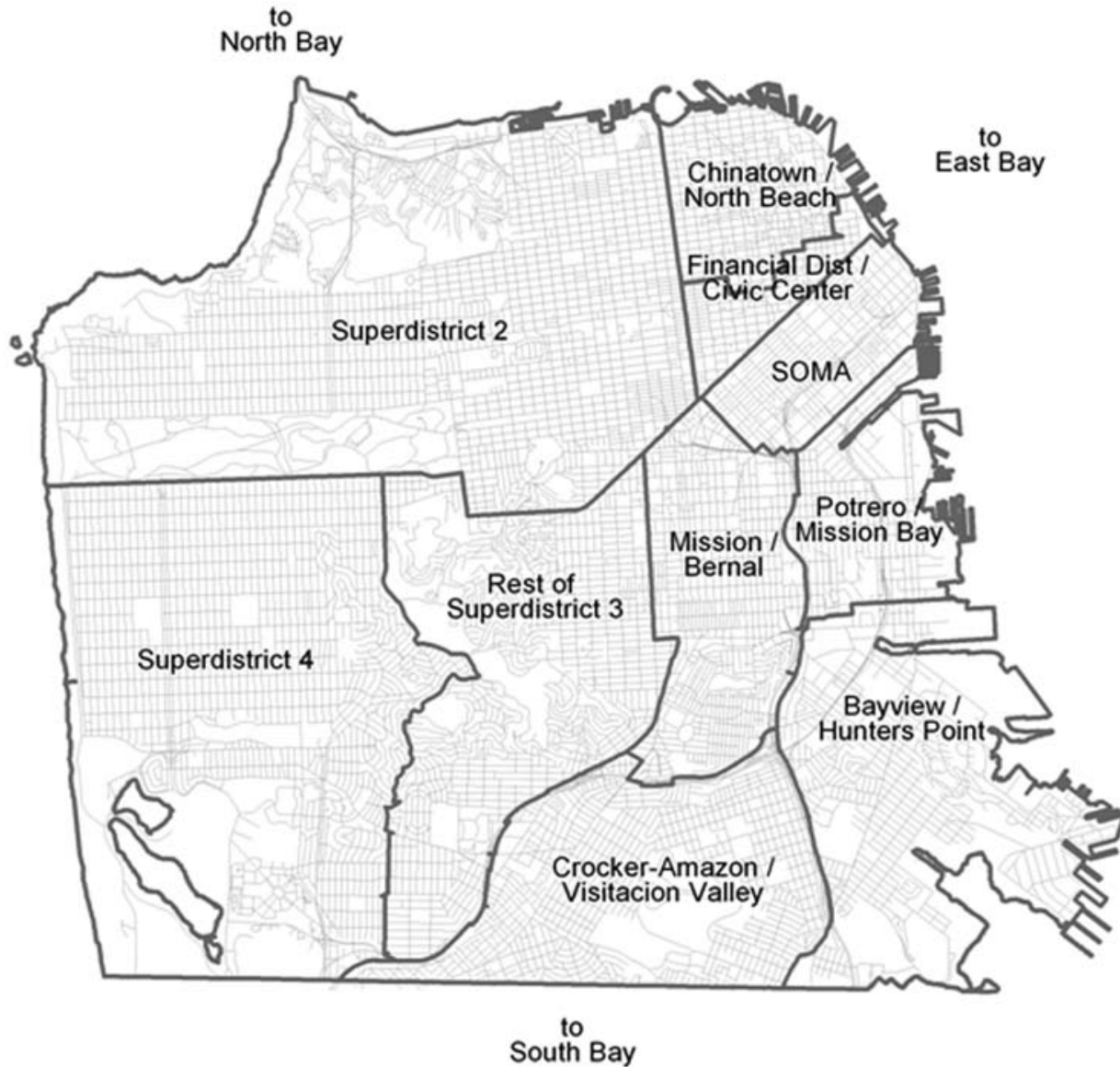


Source: MTA
 Not to Scale

Transit Travel Times

Travel times are a significant influence on the attractiveness of transit for any given trip. Transit travel times relative to walking and driving are key inputs and outputs of the travel demand forecast model used

FIGURE 3-3
ORIGIN - DESTINATION DISTRICTS



Source: PB/Wong
 Not to Scale
 Revised 1/08

to estimate the future transit ridership of the Central Subway. In addition to other factors such as service frequency and stop location, the transit travel times are used in the model to predict the origins, destinations, timing, and purposes of transit trips. Average travel times by transit for select corridor origins and destinations illustrate transit service currently experienced by Third Street Corridor riders.

For the T-Third line, the travel time between the endpoints of the line is approximately 47 minutes during the a.m. peak period. Between Sunnydale Avenue/Bayshore Boulevard and Fourth/King Streets the in-vehicle travel time is 24 minutes.

For the existing 9X/9AX/9BX-San Bruno Express buses, the in-vehicle travel time between Arleta Avenue/Bayshore Boulevard and Kearny/Pacific Streets is approximately 34 minutes. In addition, the in-vehicle travel time between Arleta Avenue/Bayshore Boulevard and Kearny/Sutter Streets is 28 minutes. For both the 15-Third bus line and the 9X/9AX/9BX-San Bruno Expresses, p.m. peak service would be slightly longer due to generally more congested roadway conditions.⁴

Regional Transit Services

Several regional transit providers serve the Study Area. These include Caltrain, BART, AC Transit, Golden Gate Transit, and SamTrans.

Caltrain

Caltrain provides commuter rail service between Santa Clara and San Francisco Counties. A total of 86 trains, including 10 express trains, run along the San Francisco Bay Peninsula each weekday and almost 32,000 people take Caltrain each day.⁵ Caltrain's San Francisco Terminal is located at Fourth and Townsend Streets, approximately one and one-half mile from the core of Downtown. Several Muni local and express buses and one Metro line serve this station. Caltrain passengers who purchase a Peninsula Pass are able to transfer to any Muni bus or the light rail train at no charge. Approximately 7,150 daily passengers currently board at this station.⁶

Bay Area Rapid Transit (BART)

BART provides regional transit services, connecting San Francisco with Millbrae in the Peninsula and Pittsburg, Richmond, Fremont, and Dublin in the East Bay. In FY 06, the average weekday ridership was approximately 323,000 throughout the entire system.⁷ Connections to the Corridor and Chinatown can be made via the Embarcadero, Montgomery, and Powell BART/Muni Metro Stations along Market Street.

⁴ Travel times derived from the June 2006, Muni rotation sheets.

⁵ Caltrain Short Range Transit Plan, FY 2004/2013.

⁶ Caltrain Station Rank (Average Weekday 2006)

⁷ BART Fourth Quarter FY2006, Summary Chart, Performance Indicators, BART Website, June 2007.

Alameda-Contra Costa Transit District (AC Transit)

AC Transit is the primary bus transit operator for the East Bay counties of Alameda and Contra Costa. AC Transit operates 27 routes from the East Bay into the San Francisco Transbay Terminal. The Transbay Terminal is located two blocks east of Third Street between First and Fremont Streets and south of Mission Street. Most of the transbay service is designed for commuters and operates during peak periods only. In FY 06, the total average weekday ridership on the transbay routes was approximately 11,300 passengers.⁸

Golden Gate Transit

Serving riders from Marin and Sonoma Counties, Golden Gate Transit brings nearly 5,000 riders to San Francisco each weekday over a system of 18 commute express and 3 all-day basic bus routes. Most routes serve either the Civic Center area via the Van Ness Corridor or the Financial District via Battery/Sansome Streets. Transfers to other regional operators can be made along Mission Street and at the Transbay Terminal (two blocks east of the Corridor). Basic routes provide evening and late night service to San Francisco.

San Mateo County Transit District (SamTrans)

SamTrans is the primary public transit operator for San Mateo County, with 57 public transit routes. The service area stretches from northern Santa Clara County to Downtown San Francisco, with many routes terminating at the Transbay Terminal (two blocks east of the Corridor). SamTrans operates 11 routes that serve Downtown. Total average weekday ridership on the 11 routes serving downtown San Francisco is approximately 11,300 passengers.⁹

Bay Area Ferries

Ferry service is provided between San Francisco and Vallejo, Alameda, Oakland, and Tiburon by the Blue and Gold Fleet. Golden Gate Transit operates ferry service between San Francisco and Larkspur and Sausalito. All ferries serve the Ferry Terminal, located on The Embarcadero at the foot of Market Street.

⁸ Alameda-Contra Costa Transit District (AC Transit) GM Memo No. 7-036, Annual Transbay Service Performance Analysis.

⁹ San Mateo Transit District (SamTrans) Short Range Transit Plan, Interim-2004-2013.

Planned Regional Improvements

There are three major regional transit improvements that are identified in the current Regional Transportation Plan (RTP) and that have been included in the San Francisco travel demand model assumptions.¹⁰

- BART System – This project would improve station access, expand station capacity, and introduce new vehicles to the BART core system to reduce existing system constraints.
- Ferry Terminal – The RTP calls for improvements to the Downtown Ferry Terminal and to increasing the number of spare ferry vessels.
- Transbay Terminal – Phase 1 improvements including replacement of the existing Transbay Terminal with an upgraded facility with additional transit capacity are included in the financially constrained element of the RTP. The extension of Caltrain service from the Terminal at Fourth and Townsend Streets to the Transbay Terminal is not included in the financially constrained element of the RTP and therefore for modeling purposes is not assumed to be in place by 2030.

3.1.2 TRAFFIC

Existing Roadway Network

The Study Area contains major north-south roadways that link the southeastern quadrant of San Francisco with Downtown and provide regional connections to the Peninsula, East Bay, and Marin County. It also contains principal thoroughfares that distribute traffic in the South of Market, Union Square, Downtown, Chinatown and North Beach districts (refer to Figure 3-3). The major roadways in the Study Area are described below, including the average daily traffic volumes of 2005.¹¹

Highway 101

This principal north-south highway links San Francisco with the Peninsula to the south and with Marin County to the north. Between Interstate 80 and Interstate 280, the limited access highway 101 has ten traffic lanes. Between I-80 and the Golden Gate Bridge, Highway 101 is a six-lane surface street along South Van Ness Avenue, Van Ness Avenue, Lombard Street, Richardson Avenue, and Doyle Drive. Highway 101 at Cesar Chavez Street carries over 246,000 vehicles per day.

¹⁰ Metropolitan Transportation Commission, *Transportation 2030 Plan for the San Francisco Bay Area*, Final February 2005.

¹¹ Caltrans 2005 Traffic Counts.

Interstate 280

Interstate 280 (I-280) is a ten-lane freeway connecting the Peninsula with the southwestern quadrant of the City. For southbound traffic, I-280 provides a direct connection around the east side of Potrero Hill to Highway 101. Northbound traffic can use I-280 to access Potrero Hill and Mission Bay neighborhoods. I-280's northern terminus consists of a pair of on and off-ramps in the South of Market area, at Sixth and Brannan Streets and at Fifth and King Streets. I-280 at Mariposa Street (south of the on and off-ramps) carries over 106,000 vehicles per day.

Interstate 80

Interstate 80 (I-80) provides the primary access to and from the San Francisco Oakland Bay Bridge (Bay Bridge) which connects to the East Bay and it also connects directly with Highway 101, west of Ninth Street. In the vicinity of Third and Fourth Streets, I-80 has three through lanes in each direction. I-80 provides access to the Bay Bridge, which carries up to 294,000 vehicles a day. A set of on-and-off ramps is located at Fifth Street and Fourth Street for eastbound and westbound I-80 traffic, respectively.

Third Street

Third Street serves as a principal north-south arterial, extending north from its interchange with Highway 101 and Bayshore Boulevard to Market Street in the Financial District. Third Street serves as a through street and as a connection between the commercial and industrial areas located along the length of Third Street and the Highway 101 and I-80/Bay Bridge regional freeway facilities. The San Francisco *General Plan* identifies Third Street as a Major Arterial and a Transit Important Street. It is also part of the Congestion Management Plan (CMP) network and Metropolitan Transportation System (MTS).

In the SOMA area, Third Street serves as the principal northbound arterial into the Financial District from Mission Bay and the City's growing eastern waterfront. Third Street is a one-way, northbound arterial (with one-way southbound Fourth Street) between King Street and Market Street. Third Street is typically 62.5 feet wide with 10-foot wide sidewalks on both sides. In this section of Third Street, there are three 10-foot northbound through lanes. The configuration of the outside lanes varies by time of day and block. There is a dedicated northbound bus lane on the east side of the street that starts 200 feet south of Brannan Street and continues north to Market Street. Peak hour parking restrictions allow the use of the curb lane as a dedicated turn lane for Brannan, Bryant, and Mission Streets. Metered parking on both sides of Third Street exists between Market and King Streets, with the exception of the block between Howard and Folsom Streets, where parking is restricted all day long.

Fourth Street

Fourth Street, between King and Market Streets, is designated as a Major Arterial in the *General Plan*. With a 62.5 feet curb-to-curb width and two 10-foot wide sidewalks, Fourth Street is a key roadway connection between the Financial District and southbound I-80 and I-280. Fourth Street also provides the most direct pedestrian connection between the Financial District and Union Square and the new commercial and residential developments in the vicinity of the Caltrain Terminal at Townsend Street.

From its northern terminus at Market Street, Fourth Street draws traffic from southbound Stockton Street and eastbound O'Farrell Street. The number of traffic lanes on Fourth Street between Market and Townsend Streets varies between two and four through lanes. The configuration of the parking lanes varies by time of day and block. Multiple left-turn and right turn lanes exist at Mission, Folsom, and Harrison Streets. Between Harrison and Townsend Streets, a dedicated bus-only lane with a raised boarding island at Townsend Street, is located on the east side of the roadway. At Townsend Street, a dedicated left-turn lane separates the bus lane from the curb. Fourth Street, south of Townsend Street where it fronts the Caltrain Terminal, becomes a two-way street with two lanes in each direction. At Fourth and King Streets, the T-Third line intersects with the Muni Metro Extension (MMX) line from Market Street to Fourth Street, then continues south crossing over Mission Creek to Mission Bay via the Fourth Street Bridge. Existing metered parking can be found on both sides of Fourth Street between Market and Townsend Streets, except for the block between Mission and Howard Street, where a 24-hour parking restriction is in effect. As with other streets in the South of Market Area, Fourth Street has a combination of full-time and part-time tow-away restrictions of several block faces to increase traffic capacity during the peak travel hours.

Fifth Street

Fifth Street runs north and south between Market Street to the north and Townsend Street to the south, where it ends at the Caltrain Rail Yard. Fifth Street is a two-way street with two traffic lanes in each direction. The curb-to-curb width is generally 62.5 feet throughout the Study Area. There are 10-foot wide sidewalks and on-street parking along both sides of the street. The San Francisco *General Plan* identifies Fifth Street as a Major Arterial between Market and Bryant Streets and a Citywide Bicycle Route between Market and Townsend Streets. Metered parking is established on both sides of Fifth Street from Market to Bluxome Streets, except the block between Harrison and Bryant Streets, where there are tow-away restrictions in place, and the block between Bryant and Brannan Streets, where there is an existing one-hour parking regulation from 7 a.m. to 6 p.m., Monday through Saturday.

Sixth Street

Sixth Street provides a direct connection to the I-280 freeway in the South of Market Area at Townsend Street. Sixth Street is a two-way, north-south arterial with four traffic lanes and a curb-to-curb width of 62.5 feet throughout the Study Area. There are 10-foot wide sidewalks on both sides of the street. An additional traffic lane is provided in the southbound direction on Sixth Street between Howard and Harrison Streets during the p.m. peak period, due to on-street parking restrictions. Metered parking is provided along both sides of the street between Market and Folsom Streets.

King Street

King Street is a wide, landscaped boulevard providing a direct east-west connection between The Embarcadero and the I-280 on and off-ramps at Fifth Street. With a 126-foot curb-to-curb width and 20-foot wide sidewalks in the vicinity of Third and Fourth Streets, King Street has unique and varied geometries designed to safely accommodate high pedestrian, light rail, and vehicle flows. It is a four-lane, two-way street with Muni Metro tracks in a center median. In general, parking is not permitted on King Street, except on the north side between The Embarcadero and Third Street. King Street has an average daily traffic volume (ADT) of 21,580 east of Third Street.¹² It is designated as a Major Arterial, Primary Transit Street, a Neighborhood Network Connection Street, and Bicycle Route east of Third Street in the *General Plan*.

The Embarcadero

The Embarcadero, along the eastern edge of the Study Area, has three traffic lanes in each direction between Howard and Broadway Streets, and two traffic lanes in each direction south of Howard Street. An ADT of 47,700 was recorded at Washington Street, north of the Study Area. With a curb-to-curb width exceeding 120 feet in many locations, The Embarcadero readily accommodates Muni's semi-exclusive median rail right-of-way between South Beach Park and Fisherman's Wharf. The F-Line's Fisherman's Wharf extension operates in a semi-exclusive median right-of-way from Broadway Street to Kearny Street.

The *General Plan* designates The Embarcadero as a Major Arterial, a Primary Transit Street, a Neighborhood Commercial Street, a Citywide Bicycle Route with marked bike lanes, as well as a freight traffic route. Metered parking along The Embarcadero is managed by the Port of San Francisco. The walkway or promenade on the east side of The Embarcadero also serves as a key recreational trail for tourists, walkers, joggers and skaters.

Market Street

¹² DPT count, 10/7/2004

Market Street is the central spine of San Francisco's Downtown and South of Market districts, serving as the axis from which the two street grid systems diverge. It is a two-way, four-lane street with a 120-foot right-of-way and sidewalks that range from 26 feet to 35 feet wide, with restricted transit lanes, boarding islands and marked bicycle lanes in the vicinity of the Project. Market Street primarily serves the City as a transit corridor, providing rail and bus transit service on the surface and two underground levels of rail service, Muni Metro and BART. Market Street is designated as a Primary Transit Street, a Neighborhood Commercial Street, and a Citywide Bicycle Route. Parking on Market Street is restricted to commercial loading and unloading use.

Geary Street

Geary Street is an east-west street providing a connection from the Union Square area to the Richmond District. In the vicinity of Union Square, the street is typically 38 feet wide with 15-foot sidewalks. In the Union Square area, it is one-way in the westbound direction and has two-mixed traffic lanes and a transit lane. Geary Street is designated in the *General Plan* as a Major Arterial, a Primary Transit Street, and a Neighborhood Commercial Street. Metered parking is available on both sides of Geary Street, except for the north side between Stockton and Powell Streets, which directly fronts the Union Square garage entrance.

Stockton Street

Stockton Street is a three-lane street that extends north from Market Street, past Union Square, Chinatown, and North Beach to Beach Street in the vicinity of Fisherman's Wharf. It is one-way in the southbound direction between Market and Sutter Streets, with two travel lanes and a transit lane. North of Sutter Street, it is two-way with one northbound lane and two southbound lanes. It traverses through a tunnel under Nob Hill between Sutter and Sacramento Streets. Within the tunnel, there is a single northbound bicycle climbing lane. Stockton Street is designated as a Primary Transit Street, a Neighborhood Commercial Street, and a Citywide Bicycle Route. In the Union Square area, Stockton Street has full-time tow-away restrictions on several blocks to increase capacity during the peak travel hours, with metered parking allowed in spot locations. In Chinatown, most of the metered parking spaces are established for commercial loading and unloading for the various businesses along Stockton Street.

Kearny Street

Kearny Street has a 46-foot wide curb-to-curb width and two 14-foot wide sidewalks. Kearny Street is designated as a major arterial in the San Francisco *General Plan*. It is also a designated Primary Transit Street between Broadway and Market Street and a Neighborhood Commercial Street between Market Street and Columbus Avenue. Typically four lanes wide, Kearny Street has peak hour parking

restrictions that allow a second left-turn lane at Sutter and Pine Streets and a second right turn lane at Post, Bush and California Streets. Metered parking is established on the west side of Kearny Street between Geary and Bush Streets and a daytime tow-away restriction (7 a.m. to 6 p.m.) on the east side of the street.

Columbus Avenue

Columbus Avenue, designated as a Major Arterial in the *General Plan*, provides a direct connection between the Financial District and Fisherman's Wharf. It is also a designated Primary Transit Important Street and Neighborhood Commercial Street between Kearny and North Point Streets. Columbus Avenue has a curb-to-curb width of 60 feet with 10-foot sidewalks. This width allows for two traffic lanes in each direction, and includes painted medians and turn pockets where required. Metered parking exists on both sides of Columbus Avenue, except where the bus zones serve the 15-Third, 30-Stockton, 41-Union, and the 45-Union-Stockton lines. A tree-planted median in the middle of Columbus Avenue exists between Union and Filbert Streets.

Planned Roadway Improvements

Roadway improvements planned for implementation in the Study Area or in the immediate vicinity include: the Bay Bridge approach and Terminal Separator ramps and roadway changes related to improvements at the Transbay Terminal. These roadway improvement projects are discussed in Section 2.1.1.

Traffic Volumes

Table 3-3 lists existing average weekday and peak hour traffic volumes on several roadways in the Corridor. The total two-way volume of a.m. and p.m. peak period traffic along most of the Corridor is generally similar. However, during the morning peak period, almost two-thirds of the traffic on Third Street's two-way segments is northbound toward the Downtown. During the p.m. peak period, traffic flows are closely balanced in the northbound and southbound directions.

Traffic counts conducted along Corridor area roadways indicate that the heaviest traffic volume periods occur on weekdays between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. Therefore, this study assesses the potential impacts the proposed project alternatives could cause to the transportation network during these typical weekday periods.

TABLE 3-3
EXISTING WEEKDAY TRAFFIC VOLUMES IN THE CORRIDOR

Roadway	Location	Daily (Approx.)	A.M. Peak Hour	P.M. Peak Hour
Count Location		Traffic Volumes		
Interstate 280	Between 18th & Sixth Streets	95,000	11,440	11,340
	Between Sixth & Fifth Streets	52,000	2,490	2,470
Interstate 80	Between Fourth & Second Streets	201,000	13,740	11,560
Third Street	NB Between King & Townsend Streets	23,800	1,050	1,720
	NB Between Harrison & Folsom Streets	28,500	2,060	1,770
Fourth Street	SB Between King & Townsend Streets	11,300	780	1,160
	SB Between Harrison & Folsom Streets	29,000	1,450	1,770
King Street	Between Fourth & Third Streets	24,900	2,730	3,370
	Between Third & Second Streets	18,500	2,590	3,380
Geary Street	WB Between Powell & Stockton Streets	11,500	1,190	1,640
Stockton Street	SB Between Market & O'Farrell Streets	18,200	980	1,120
	SB Between Geary & Post Streets	18,000	1,410	1,750

Notes: All volumes are two-way volumes unless otherwise noted.

NA – Not Available

Source: San Francisco Department of Parking and Traffic and San Francisco Model, 2007.

Intersection Levels of Service

This SEIS/SEIR evaluates the weekday peak hour operations of five key signalized intersections along the Third, Fourth, and Sixth Street corridors that could be affected by the proposed alternatives. Other intersections along these street corridors may also be effected by Project alternatives, therefore the five intersections designated for analysis are representative of traffic conditions in the vicinity. In 2006, traffic conditions were assessed by DPT based on a.m. and p.m. peak hour turning movement counts at each of the Study Area intersections to assist in determining current traffic levels.

LOS is used to describe how efficiently an intersection operates. The method used for signalized intersection analysis generally defines LOS in terms of delay, which is the average amount of time a vehicle must wait before being able to pass through the intersection. The delay is expressed by letter designation from LOS A, which signifies very low delays (under 10.0 seconds per vehicle), to LOS F, which signifies substantial delays (over 80 seconds per vehicle) and congestion. In urban settings, LOS E (over 55 seconds to 80 seconds of delay per vehicle) and LOS F (80 seconds or greater delay) are

considered unacceptable levels of service. (LOS criteria for signalized intersections are defined in detail in Table E-5 in Appendix E.)

Existing peak hour service levels at each of the signalized intersections are presented in Table 3-4. During the a.m. peak hour the Third Street/King Street intersection performs at LOS D and the Fourth Street/Harrison Street and Fourth Street/Bryant Street intersections operate at LOS B. The other two Study Area intersections (Fourth/King and Sixth/Brannan) perform at LOS E and F, respectively, in the a.m. peak hour, when the traffic flows from the I-280 off-ramps are the heaviest. During the p.m. peak hour, two of the Study Area intersections operate at LOS ~~SSC~~, or better B, with the other three operating at LOS E or F conditions as outbound traffic peaks towards the I-280 freeway on-ramps. During the afternoon peak, traffic may queue back several blocks on City streets on approaches to the freeway ramps in the South of Market area. Congestion occurs not only at the intersections noted in Table 3-4, but also at other intersections along these streets.

TABLE 3-4
EXISTING INTERSECTIONS
LEVEL OF SERVICE CONDITIONS

INTERSECTION	A.M. PEAK HOUR (LOS/ave. sec. delay)	P.M. PEAK HOUR (LOS/ave. sec. delay)
Third Street / King Street	D/ 36.1 <u>D/ 35.8</u>	F/ >80.0
Fourth Street / King Street	E/ 55.9	F/ >80.0
Fourth Street / Harrison Street	B/ 13.2 <u>B/ 13.5</u>	B/ 19.5 <u>B/ 18.5</u>
Sixth Street / Brannan Street	F/ >80.0	F/ >80.0
Fourth Street / Bryant Street	B/ 11.8 <u>B/ 18.9</u>	C/ 20.7 <u>B/ 19.6</u>

Source: San Francisco Department of Parking and Traffic, November 2006 and February 2007. Revised February 2008

Traffic Travel Speeds

Average vehicle travel speeds were determined along the Fourth Street Corridor. Existing average travel speeds, which account for delays at intersections and congested conditions, are summarized in Table 3-5. On Fourth Street, peak period speeds average between 7 and 23 miles per hour.

**TABLE 3-5
EXISTING TRAFFIC TRAVEL SPEEDS**

ROUTE	PEAK PERIOD	AVG. SPEED LOS/(mph)
<i>Fourth Street:</i>		
King to Brannan Streets	P.M.	E/ 7.2
Brannan to Bryant Streets	P.M.	D/12.1
Bryant to Harrison Streets	P.M.	B/22.6

Source: Department of Parking and Traffic, February 2007, and Transportation Research Board, Highway Capacity Manual 2000, Exhibit 15-2, 2000.

The San Francisco County Transportation Authority, as Congestion Management Agency for San Francisco, periodically monitors average travel speeds along key segments of the designated Congestion Management Program (CMP) network in the City, including arterials and freeways. The CMP network includes all of the principal arterials within the City, including Fourth Street. Travel speeds have been monitored since 1991 and were last measured for CMP purposes in 2004. On Fourth Street, the CMP p.m. speeds were about seven miles per hour slower when compared to the current speeds. The speed increases are primarily due to recent adjustments to the cycle lengths, offsets, and splits in regards to the signal timing sequences to improve traffic progression. The performance of the CMP roadway network is measured against LOS standards for arterial roadways. If roadway performance falls below the standard (i.e., congestion worsens), actions must be undertaken to restore or improve the service level. The San Francisco CMP sets a standard of LOS E for the designated CMP network (LOS criteria for arterial roadways are defined in detail in Table E-6 in Appendix E). Currently, average travel speeds on Fourth Street are in the LOS B to E range during the p.m. peak period.

3.1.3 FREIGHT AND LOADING

While not officially designated as truck routes, Third Street and Fourth Street are called out in the San Francisco *General Plan* as routes with significant levels of truck traffic. Because of recurring peak hour congestion levels and relatively narrow lanes, Third and Fourth Streets are not preferred truck routes for non-local through trips. Truck drivers with large vehicles and a familiarity with the City would likely opt to avoid the Financial District and select a longer route along The Embarcadero or along other City arterials like Van Ness Avenue.

In order to adequately serve the many commercial businesses on Third and Fourth Streets and accommodate the occasional service needs of residents, the City has designated yellow metered loading areas along the corridor. On Fourth Street between Folsom and Townsend Streets there are ten metered yellow loading zones. On Third Street between Bryant and King Streets, there are 18 metered yellow

loading zones during the daytime non-peak hour times. Currently, the yellow zones are located on both sides of these streets and can only be accessed from one direction since Third and Fourth Streets are one-way streets. A review of the existing commercial businesses on Third and Fourth Streets between Harrison and Townsend Streets revealed that most, if not all, of the commercial loading/unloading activities occur on-street at the yellow zones since there are very few off-street truck loading facilities or docks available.

Because Third and Fourth Streets are currently both multi-lane, one-way streets, the accommodation for truck turning movements is adequate since trucks can straddle more than one traffic lane, when necessary, on approaches to intersections in preparation for making wide turns. In addition, side streets are generally wide enough to accept the truck turn movements from Third and from Fourth Streets; except on Perry and Stillman Streets.

Stockton Street is a mix of on-street metered parking, on-street loading zones, and bus zones. In some blocks, between Market and Sutter Street, on-street parking and loading has been removed completely to accommodate the flow of traffic, access to the public parking garages, and bus stops. The on-street loading spaces in both Union Square and Chinatown are important to servicing the adjacent retailers as off-street loading docks are limited.

On Columbus Avenue, between Union and Powell Streets, there are no off-street loading spaces.

3.1.4 PARKING

On-Street Parking

Parking conditions along the Central Subway Corridor were surveyed during a mid-morning and two mid-afternoon weekday afternoon periods in September, 2006, south of Market Street and mid-afternoon weekday north of Market Street in May 2007. In each survey, block-by-block on-street parking occupancy counts and parking capacity measurements (excluding driveways and illegal parking zones, e.g., red zones for bus stops and fire hydrants, etc., but including yellow and white loading zones) were conducted. To conservatively assess potential parking impacts resulting from the Project alternatives, the following discussion presents the average parking occupancy counts, by block, of the surveys. Existing parking conditions are summarized in Table 3-6.

Parallel parking is allowed on both sides of Third Street between King and Bryant Streets and along both sides of Fourth Street between Bluxome and Harrison Streets. Many of these on-street parking spaces

are regulated with 15-minute, 30-minute, 1-hour, or 2-hour parking meters or time limits. In this area, metered parking spaces, many with short time limits, have been established to discourage long-term parking and encourage parking turnover. The abutting land uses consist of industrial, commercial and residential developments. On those segments of Third and Fourth Streets that will be impacted by the Project, there are currently ~~172~~192 on-street parking spaces (~~201~~221 including the spaces removed for construction on Fourth Street between Bryant and Harrison Streets).

TABLE 3-6
EXISTING ON-STREET PARKING CONDITIONS IN CORRIDOR

SEGMENT	WEST	EAST	TOTAL	NO.	Percent
	APPROXIMATE NUMBER OF ON-STREET PARKING SPACES			NUMBER AND PERCENTAGE OF SPACES OCCUPIED	
<i>Third Street</i>					
King to Townsend Streets	13 (All metered)	10 (All metered)	23	20	87%
Townsend to Brannan Streets	19 (All metered)	16 (Tow-away east side 7-9 a.m. & 4-7 p.m.)	35	20	57%
Brannan to Bryant Streets	21 (All metered)	13 (Tow-away east side 7-9 a.m. & 4-7 p.m.)	34	25	74%
Subtotal	53	39	92	65	71%
<i>Fourth Street</i>					
Townsend to King Streets	0	0	0	0	0%
Townsend to Brannan Streets	5 (All metered)	15 (All metered)	20	14	70%
Brannan to Bryant Streets	20 (All metered)	16 (10 metered, Tow-away east side 7 am-7 pm between Freelon and Brannan – affects 6 sp)	36	30	83%
Bryant to Harrison Streets ¹	17 (all metered)	12 (all metered)	29	N/A	N/A
Subtotal²	25+	31+	56	44	79%
<i>Stockton Street</i>					
Gearly to Post Streets	0	10	10	4	40%
Clay to Washington Streets	11 (All metered)	3 (All metered)	14	11	79%
<u>Washington to Jackson Streets</u>	<u>8</u> (All metered)	<u>12</u> (All metered)	<u>20</u>	<u>18</u>	<u>90%</u>
Subtotal³	11 <u>19</u>	13 <u>25</u>	24 <u>44</u>	15 <u>33</u>	63% <u>75%</u>
TOTAL	89<u>97+</u>	83<u>95+</u>	172+<u>192+</u>	124<u>142</u>	72%<u>74%</u>

¹ This segment of Fourth Street was under construction during the recent counts. Therefore, no parking occupancy data was available.

² Occupancy counts do not include the segment between Bryant and Harrison, so the 29 parking spaces between Bryant and Harrison Streets numbers are not included in the subtotal.

³ Average occupancy was not calculated for the Stockton Street blocks because the two blocks are located in different districts and an average occupancy would not give an accurate assessment of occupancies in each area.

Source: San Francisco Department of Parking and Traffic, Sept. 27 and 28, 2006, ~~and~~ May 7 and 8, 2007, and January 2008.

Parking occupancy surveys were not conducted north of Bryant Street on Fourth Street and north of Bryant Street on Third Street because Caltrans' construction staging activities for the Bay Bridge West Approach Retrofit Project have temporarily removed parking in the area. In general, on-street parking is usually fully occupied on Third and Fourth Streets north of Bryant Street.

On Stockton Street, parking counts were conducted on the blocks potentially affected by the proposed stations and/or vent shafts where parking removal was anticipated. There are 10 parking spaces on the block between Geary and Post Streets, ~~and~~ 14 spaces on the block between Clay and Washington Streets, ~~and~~ 20 spaces on the block between Washington and Jackson Streets (including truck and passenger loading zones). The average occupancy is ~~63~~75 percent for these ~~two~~three blocks of Stockton Street.

On the block between Geary and Post Streets, all of the parking is located on the east side of the street and consists of 10 metered yellow loading zones. Observed mid-day weekday occupancy was only 40 percent, but occupancy would be expected to vary throughout the day as deliveries are made. On the blocks between Clay and ~~Washington~~Jackson Streets, there are a total of ~~44~~34 metered spaces, composed of a mix of standard parking spaces and white and yellow zones. The average weekday occupancy in ~~this~~ these two blocks is ~~79~~85 percent.

Parking Summary

Table 3-6 also summarizes the current corridor-wide parking occupancies. On Third Street between King Street and Bryant Street, there are 92 spaces. On Fourth Street between King Street and Bryant Street, 56 on-street parking spaces exist and on the ~~two~~three blocks of Stockton Street evaluated, there are ~~24~~44 parking spaces. Existing parking occupancy is approximately ~~72~~74 percent on a combined corridor-wide basis.¹³

3.1.5 PEDESTRIANS

Pedestrian Streets

Third Street, between King and Market Streets, is designated as a Neighborhood Commercial Street in the *General Plan*.¹⁴ Other streets in the Study Area with the same designation include Berry Street (from

¹³ Because of Caltrans construction on the Bay Bridge West Approach, the portion of Fourth Street between Harrison and Bryant has been excluded from this occupancy survey

¹⁴ San Francisco Planning Department, San Francisco *General Plan*, Transportation Element, adopted June 1978, amended in February 2005. A Neighborhood Commercial Street is a street in a Neighborhood Commercial District as identified in the *General Plan* with predominantly commercial use and parking and loading conflicts. Design goals are to maintain at least four feet of unobstructed width for pedestrian passage, encourage pedestrian-oriented uses, maintain a buffer (trees and parking) between pedestrian and vehicular circulation, meet minimum crosswalk requirements, and restrict turning movements and curb cuts. Pedestrian improvements which reflect the neighborhood character should be a priority.

Fourth Street to The Embarcadero), The Embarcadero, Market Street, Stockton Street, and Geary Street.

This designation indicates that the street is locally significant for pedestrian circulation. Third and Fourth Streets, between Folsom and Market Streets, and Market Street from Steuart Street westward, are designated as Citywide Pedestrian Network Streets in the *General Plan*.¹⁵ This designation is reserved for streets of citywide significance, used for walking between neighborhoods and connecting major institutions and transit facilities.

The sidewalk on the east side of Third Street, between Clementina and Howard Streets, in the vicinity of the proposed Moscone Station entrance, is just over 10 feet wide. Building columns supporting upper floors are situated east of the sidewalk, and between the columns and the first floor building facade an 8- to 13.5-foot wide private sidewalk arcade exists. On the west side of the street, the sidewalk is situated behind the driveway entrance to the Moscone Center garage. On both sides of Third Street between Mission and Market Streets, the sidewalks are about 14 feet wide.

The sidewalks on Fourth Street in the Study Area are generally 10 feet wide. On the block between Howard and Folsom Street, the sidewalk on the west side is 16 feet wide. Moscone Center South fronts the east side of this block. On the east side, the pedestrian walkway is located within the Moscone Center property rather than on the public sidewalk to accommodate the entrance to the Moscone Center underground loading docks. All intersections of Fourth Street are signalized with pedestrian crosswalks. The land uses in this section are a mix of commercial, industrial, and public. The greatest concentration of pedestrian activity occurs adjacent to the Caltrain Terminal (at Fourth and Townsend Streets) as passengers walk to and from the station or transfer between Muni LRVs, buses, and the commuter trains. The pedestrian LOS near the Caltrain Terminal is LOS D.¹⁶ The City plans to install an audible pedestrian signal at this location to facilitate pedestrian movement.

On the east side of Stockton Street, both north and south of Post Street, the sidewalks are 15 feet wide. On the west side of Stockton Street, south of Post Street, the sidewalk abutting Union Square Park is 10 feet wide. On the north side of Post Street, the sidewalk is 15 feet wide within the public right-of-way. Near Clay Street, Stockton Street's eastside sidewalks are about 11 feet wide. North of Clay Street, Stockton's western sidewalk is 10.5 feet wide, and to the south of Clay Street, the sidewalk is 29.5 feet wide. Stockton Street has some of the heaviest pedestrian volumes in the City, with people frequently walking in the street to avoid sidewalk queues. Physical pedestrian improvements, such as corner bulb-outs, delineated pedestrian walkway with colored concrete, standardized diagonal crossing striping, and

¹⁵ Ibid. Citywide Pedestrian Network Streets are of "citywide significance," providing inter-neighborhood connection and including both exclusive pedestrian and pedestrian-oriented vehicular streets. These streets are intended to connect major institutions and transit facilities and to be used by commuters, tourists, general public, and recreational users.

bi-lingual pedestrian crossing signs are proposed as part of the Stockton Street Enhancement Project, but are not yet funded.¹⁷

Bay Trail

A portion of the regional Bay Trail runs through the Study Area (see Figure 3-4 for the route along the eastern waterfront). The Bay Trail is intended to provide continuous access to the San Francisco Bay's waters edge. It connects in the north from the recently completed pedestrian promenade along The Embarcadero to Fourth Street via King Street. It crosses the Fourth Street bridge and swings eastward into the China Basin Park around McCovey cove and connects with bike lanes on Terry A. Francois Boulevard and an existing bike route on Illinois Street to access the City's southeastern waterfront.

Pedestrian Levels of Service

Table 3-7 summarizes the existing pedestrian level of service at the proposed station entrances in the Project Corridor. Pedestrian counts were collected at specific locations along the Corridor at each of the proposed stations that could potentially be impacted by the placement of station entrances as part of the Central Subway Project. The Highway Capacity Manual (HCM) methodology (Chapter 18) was used to calculate the pedestrian level of service on sidewalks at these locations. According to the results from the pedestrian counts, the existing pedestrian levels of service at all proposed station entrances operate at LOS A.

3.1.6 BICYCLES

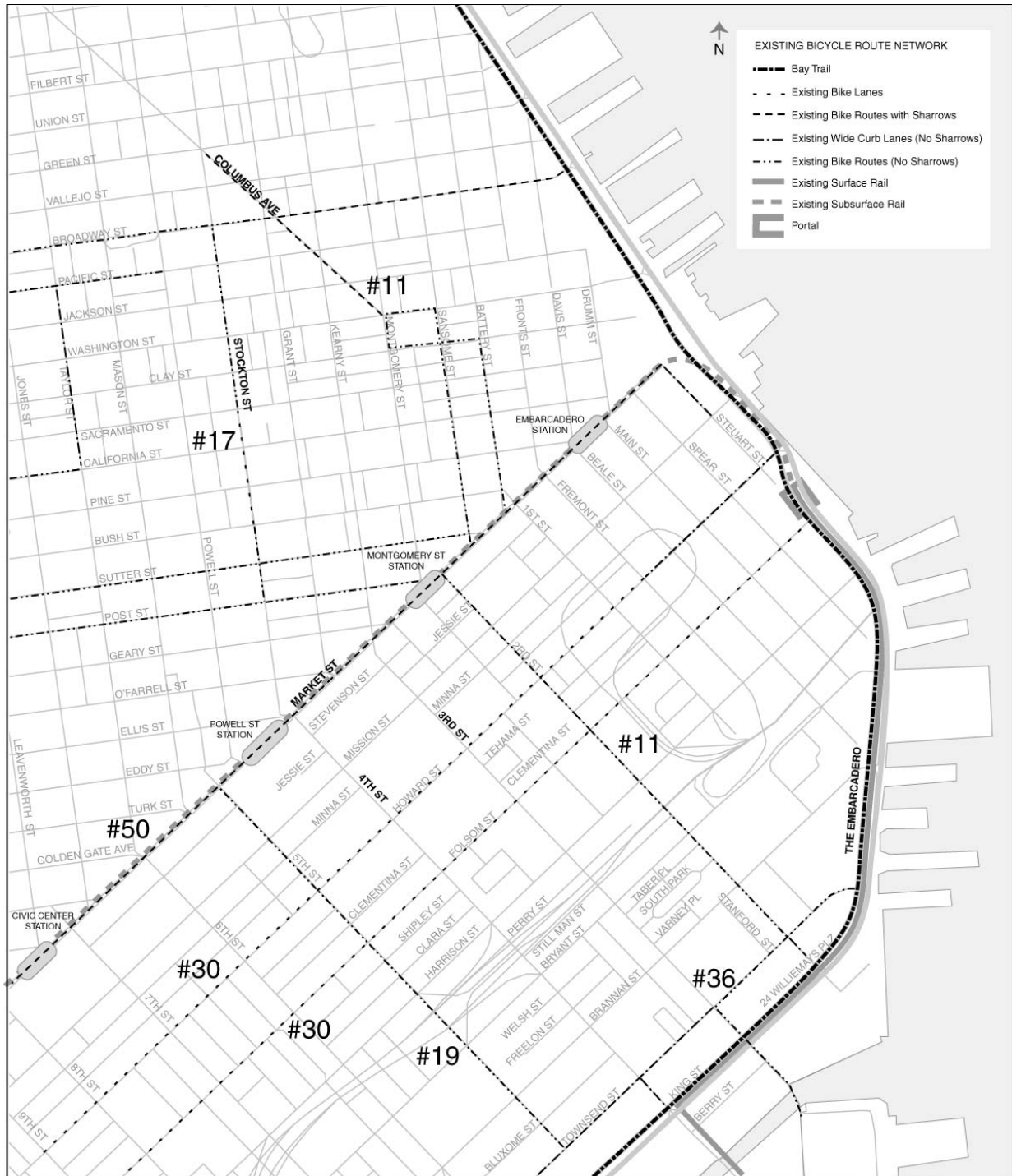
The San Francisco General Plan designates an Official Bicycle Route Network (refer to Figure 3-4). The Official Bicycle Route Network does not include designated bicycle routes on Third or Fourth Streets in the South of Market Area, except for a three block segment on Third Street between Townsend Street and Terry A. Francois Boulevard (Route #536 traverses Third Street between Townsend Street and King Street, and Route #5 traverses Third Street between King Street and Terry Francois Boulevard).

¹⁶ U.S. Department of Transportation Federal Transit Administration and the City and County of San Francisco, Peninsula Joint Powers Board, and San Francisco Redevelopment Agency, Transbay Terminal Downtown Extension/Redevelopment Project FEIS/FEIR/Section 4(f) Evaluation, March 18, 2004.

¹⁷ City and County of San Francisco, Department of Parking and Traffic in cooperation with the Chinatown Development Center, Stockton Street Enhancement Project, June 30, 2003.

FIGURE 3-4

BICYCLE ROUTES AND BAY TRAIL IN THE THIRD STREET CORRIDOR



Source: PB/Wong
Not to scale

TABLE 3-7
EXISTING PEDESTRIAN LEVEL OF SERVICE
AT PROPOSED STATION ENTRANCES

Intersection	Corner	Street	15-minute count ¹	Effective Walkway Width (ft)	Ped Unit Flow Rate (ped/min/ft)	LOS
Market Street Station						
Third/Market	SW	Market	431	27.5	1.04	A
Third/Market	SE	Market	523	25.0	1.39	A
Moscone Station						
Fourth/Howard ²	NE	Fourth	121	11.0	0.73	A
Fourth/Howard	NW	Fourth	96	12.0	0.38	A
Fourth/Howard	NW	Howard	72	18.0	0.27	A
Union Square and Union Square/Market Street Station						
Stockton/Geary	NE	Geary	238	19.5	0.84	A
Stockton/Maiden Lane	NE	Stockton	262	7.00	2.49	A
Stockton/Maiden Lane	SE	Stockton	261	9.00	1.93	A
Chinatown Station						
Stockton Between Sacramento and Clay	Mid	Stockton	179	7.0	1.70	A
Stockton/Washington	SW	Stockton	193	6.5	1.98	A
Hang Ah Alley (South of Clay)	Mid	Hang Ah	27	11.0	0.16	A

¹ Counts conducted April and June 2007 p.m. peak period.

² Proposed station elevator location.

However, there are two bicycle routes that run parallel to the Third and Fourth Street corridors in the South of Market Area. Route #11 is a designated bicycle route on Second Street between Market and King Streets to the east of the Project Corridor, and Route #19 is a designated bicycle route on Fifth Street between Market and Townsend Streets to the west of the Project Corridor. Additionally, Route #36 is a designated bicycle route on Townsend Street between Eighth Street and The Embarcadero. Second Street, Fifth Street, and Townsend Street were all identified as “Priority Projects” for bicycle improvements in the San Francisco Bicycle Program’s May 2005 Proposition K 5-Year Prioritization

Program.¹⁸ North of Market Street, Route #17 traverses Stockton Street between Broadway and Post Street.

Bicycle Routes

Route #5 (The Embarcadero/Third Street Corridor)

Route #5 follows Third Street, King Street, and The Embarcadero near the Project Corridor, with existing bicycle lanes provided in both directions on King Street and The Embarcadero. The Third Street portion connects with the Mission Bay development via a bridge that crosses the China Basin channel.

Route #11 (Second Street)

Route #11 follows Second Street between Market and King Streets. The San Francisco Bicycle Program's May 2005 Proposition K 5-Year Prioritization Program identified the portion of Route #11 on Second Street, between Market and King Streets, as a "Priority Project" and several conceptual improvement options were developed and received public input and feedback.

Route #17 (Stockton Street)

Route #17 follows Stockton Street between Broadway and Post Street. A northbound bicycle lane exists on Stockton Street between Bush and Sacramento Streets, which provides cyclists a dedicated lane as they climb upgrade towards Chinatown. The San Francisco Bicycle Program's May 2005 Proposition K 5-Year Prioritization Program recommends exploring adding bicycle lanes along the entire length of Stockton Street between Broadway and Market Street by removing one of the two southbound travel lanes in the Stockton tunnel to enable striping a southbound bicycle lane and by creation of a contraflow bicycle lane on the one-way southbound portion of Stockton Street between Sutter and Post Streets.

Route #19 (Fifth Street and Fourth Street)

Route #19 follows Fourth Street between Third Street (Route #5) and Townsend Street (Route #36), Townsend Street to Fifth Street, and Fifth Street to Market Street. The San Francisco Bicycle Program's May 2005 Proposition K 5-Year Prioritization Program identified the portion of Route #19 on Fifth Street between Market and Townsend Streets as a "Priority Project" and several conceptual improvement options were developed and received public input and feedback – the document notes that the Central Subway's proposed alignment on Fourth Street could adversely increase traffic volumes on Fifth Street

¹⁸ San Francisco County Transportation Authority, San Francisco Bicycle Program, Proposition K 5-Year Prioritization Program, May 2005. The Bicycle Improvement Program is currently undergoing separate environmental review.

and that Muni's associated environmental documents for the Central Subway should address this impact to Fifth Street.^{19,20}

Route #36 (Townsend Street)

Route #36 follows Townsend Street between Eighth Street (Route #23) and The Embarcadero (Route #5). The San Francisco Bicycle Program's May 2005 Proposition K 5-Year Prioritization Program identified portions of Townsend Street as a "Priority Project" and several conceptual improvement options were developed and received public input and feedback.

3.1.7 EMERGENCY VEHICLE ACCESS

Arterial Street Access

The San Francisco Fire Department's Fire Station #8 is located at 36 Bluxome Street, just west of Fourth Street. This station is one of the City's five busiest stations. Emergency vehicles responding from this station are often challenged by traffic congestion and interference on Fourth and Fifth Streets. The major streets commonly used by emergency vehicles from this fire station are: Fourth Street, Fifth Street, Brannan Street, Townsend Street, and Bluxome Street.

Fire Station #1 is located at 676 Howard Street, just east of Third Street. As with Fire Station #8, Fire Station #1 is located in the South of Market Area, where traffic congestion creates difficulties for emergency vehicles to navigate. The major streets commonly used by emergency vehicles from this fire station are: Third Street, Fourth Street, Howard Street, Mission Street, Geary Street and Kearny Street.

Fourth Street Emergency Vehicle Contraflow

Depending on their destination, emergency vehicles from Fire Station #85 may exit Bluxome Street from Fourth or Fifth Streets. When Fourth Street is congested, emergency vehicles exiting Bluxome Street make a left turn and travel "contraflow" north on Fourth Street to Brannan Street. This kind of contraflow maneuver for emergency vehicle access is typical at other fire stations located near one-way streets.

¹⁹ Ibid, Category: C.iv.b Bicycle Circulation/Safety, May 2005.

²⁰ City and County of San Francisco, San Francisco County Transportation Authority, San Francisco Bicycle Plan: Policy Framework, May 2005.

Emergency Vehicle Staging Requirements

In addition to the Bluxome Street access issue at Fire Station #8, the San Francisco Fire Department has insisted that if any portal structure is located in a roadway, consideration should strongly be given to the needs of the Fire Department vehicles to safely stage rescue vehicles on the east side of Fourth Street.

Proposed Fire Station Signal Pre-Emption System

Because existing traffic flows on Fourth Street are currently a problem, the City has been investigating the potential application of a special pre-empt signal phase to clear the vehicle queues on Fourth Street between Brannan and Townsend Streets and give the emergency vehicles greater flexibility in selecting the quickest response route. Other signalized intersections in the South of Market area near the Corridor have also been identified to be upgraded with emergency pre-emption capabilities.

3.2 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

This section identifies and evaluates the potential environmental consequences for the operation and cumulative conditions of each of the Central Subway alternatives in the areas of transit, traffic, freight, parking, non-motorized transportation, and emergency vehicle access. Mitigation measures that would reduce or avoid significant impacts are described. Construction impacts and mitigations of the transportation areas are detailed in Chapter 6.0 with all other construction impacts and mitigations. See Chapter 7.0 for CEQA determinations of significance.

3.2.1 TRANSIT

A project would have a significant effect on the environment if it would 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.²¹

Future Transit Conditions

The purpose of this section is to describe the methodology used to forecast future year (2030) transit ridership for the No Project/TSM, Enhanced EIS/EIR Alignment, Fourth/Stockton Alignment Option A (LPA), and Fourth/Stockton Alignment Option B (Modified LPA) Alternatives. The forecasts were based on outputs from the San Francisco Travel Demand Forecast Model. The analysis was conducted using the San Francisco Tour-Based Microsimulation Model (San Francisco Model), a state-of-the-art travel demand forecasting model developed for the San Francisco County Transportation Authority (SFCTA) in

the late 1990's to support transportation planning and coordination activities in San Francisco. This model has been used in long-range county-wide planning, development impact analysis, and to support the analysis of transportation impacts of major investments. The San Francisco Model is a multi-modal tool, addressing all modes of travel, including transit, auto, bike, and walk. The model can provide estimates of a wide range of travel-related measures. For transit, these measures include estimates of system ridership, route ridership, station ridership, and user benefits.

Relationship to 1998 EIS/EIR Analysis

The travel demand analysis conducted for each of the alternative Central Subway segments of the Third Street Light Rail Project is significantly different than that conducted for the 1998 EIS/EIR. In the earlier study, a growth-factor method was used to produce ridership estimates. The Draft EIS/EIR relied on data from the regional travel demand forecast model maintained by MTC (including land-use projections and transportation networks), observed transit boarding data, and an assumed relationship between travel time and demand (elasticity) to produce demand forecasts for the Third Street Light Rail Project. The ridership forecasts for the 1998 EIS/EIR were not based on runs of a travel demand forecast model for each alternative. At the time of the earlier analysis, the San Francisco Model had not yet been developed.

In contrast, travel demand forecasts for the Central Subway Project SEIS/SEIR are based on outputs from the San Francisco Model. The model was run separately for each alternative described. Differences in model outputs are the result of the different methodologies employed and the internalization of critical travel demand assumptions in the model that would potentially impact ridership. Such differences are noted where appropriate in this document.

The San Francisco Model

The San Francisco Model uses the "full day pattern" activity modeling approach. This approach simultaneously predicts the main components of all of a person's travel across the entire day. A simulation of San Francisco resident population is created, and input to the component models of vehicle availability, day pattern choice (tour and trip generation), tour and trip time of day choice, destination choice and mode choice. Destination and mode choice are also predicted at both the tour and the trip level. Simulated tours and trips are aggregated to represent flows between traffic analysis zones before traffic assignment. The model system predicts the choices for a full, representative sample of residents of San Francisco County, almost 800,000 simulated individual person-days of travel. It was created based on the observed behavior of San Francisco residents as revealed in 1990 and 1996 travel surveys conducted by the MTC. The San Francisco Model predicts demand for San Francisco County residents

²¹ Transit/Service levels are unacceptable if the demand exceeds the capacity (seats plus standees) as defined by the transit provider.

only. This San Francisco-specific travel demand is then integrated with estimates of regional travel demand produced by Baycast, the regional travel demand model developed and maintained by the MTC.

In order to estimate future travel demand, the model requires information on the location of future year employment, population, and configuration and performance of transportation networks. In addition to considering where people live, work, and shop, the model also considers the socioeconomic characteristics of Bay Area residents, and is sensitive to levels of congestion, fares, and other monetary costs. Many of these future year assumptions are based on information developed by the MTC, in order to ensure consistency with regional transportation planning efforts. An important aspect of the San Francisco Model is that it captures the effects of transit and other service quality improvements, not only in terms of new passengers attracted, but also in terms of how these improvements affect the choices of existing transit users.

The forecasts prepared as part of this effort were developed for the horizon year of 2030, consistent with the most recent Regional Transportation Plan (RTP). This forecasting effort assumed the same employment, population, and transportation network assumptions used in the RTP, with additional spatial detail added within San Francisco. Finally, the forecasting methodology used is consistent with the guidelines established for the Federal Transit Administration's (FTA's) evaluation of federal New Starts projects.

Analysis of all of the alternatives, including the No Project/TSM Alternative, assume a fixed trip distribution. This constraint is imposed by FTA to facilitate the comparison of alternatives. Some distribution models may be unreasonably sensitive to travel times and other measures of impedance, which makes alternative-to-alternative comparisons within a project difficult, and also makes comparing projects from one region to another difficult. As a result of this constraint, the assumed origin-destination patterns of travelers is assumed to be the same across all alternatives, though the transit network is different for each alternative, resulting in different estimates of transit ridership.

Base Year Validation

Prior to using the San Francisco Model for developing travel demand forecasts, the model was calibrated and validated against a base year of 2000 (before the implementation of T-Third service and the associated bus route changes). The ability of the model to match, within a reasonable tolerance, observed base-year transit ridership in the corridor is critical. Base year estimated ridership is compared to observed ridership estimates provided by Muni for selected bus and LRV routes in the Third Street/Central Subway Corridor. This analysis indicated a reasonable match to observed boardings, within two percent of observed total ridership across all routes.

Ridership Projections

Table 3-8 presents the estimated typical weekday daily ridership projections for the Project alternatives (weekday a.m. peak hour and p.m. peak hour ridership projections are provided in Tables E-1 and E-2 in Appendix E). Projections are provided for the Third Street Corridor's primary bus lines, including the 9X/AX/BX-San Bruno Expresses, 30-Stockton, and 45-Union/Stockton (the projected ridership shown for the 30-Stockton and 45-Union/Stockton lines represent only those trips on the portion of the routes between Filbert and Townsend Streets as this segment would be most directly affected by the Central Subway Project). Projections are also provided for the proposed light rail line, where applicable. All of the projections account for existing transit trips and trips generated by expected growth along the Corridor, including the development of the proposed Mission Bay project.

The daily trips projected at each of the proposed Central Subway stations or stops for each alternative are summarized in Table 3-9.

Under all Build Alternatives, the greatest amount of passenger activity would occur at the Central Subway Market Street Station (or Union Square/Market Street Station); ~~45-47~~ percent of system boardings for Alternative 2 and ~~50-49~~ and ~~48~~ percent of system boardings for Alternatives 3A and 3B, respectively. At the Powell Street Station on Market Street, the passenger activity is associated with the high level of transfers that would occur between the BART system and the Muni Metro system. It is estimated that approximately ~~38-49~~ percent of the passengers boarding the Central Subway system at Powell Street would be transfers from BART. Much of this transfer activity is presently occurring as passengers use Powell Street as a point of transfer to other Muni routes and services, some of which would be replaced by the Central Subway light rail line. By 2030, it is projected that 4,200 additional daily riders would exit and 13,000 would enter BART at the Powell Street Station.²² Additional passengers would use the concourse level of the station, however, passengers entries/exists from/to the street level is expected to decline. The 2008 study also shows fewer patrons using the station stairways and escalators between the street and concourse levels, because transfers to and from BART/Muni Metro

²² SFMTA analysis of SFCTA's 11/07 ridership projections as cited in Arup Americas, Inc. Powell Station Central subway Impacts Study, May 2008.

and the Central Subway on the concourse would replace transfers to and from the systems at the street surface level.

The Fourth and King Station, serving the T-Third Line also has a high level of passenger activity ranging from ~~25-29~~ percent (Alternative 3B) to 32 percent (Alternative 3A) of system ridership. The passenger activity at the King Street station relates to the high level of passenger transfers between Caltrain and the Muni system at this point. Caltrain boardings are projected to be about ~~89-67~~ percent of total ridership at this station in 2030. This transfer activity currently exists as passengers from the Caltrain terminal board Muni buses or the T-Third rail line to get to their destinations throughout the downtown and other parts

**TABLE 3-8
ESTIMATED WEEKDAY TRANSIT RIDERSHIP
EXISTING AND 2030 CONDITIONS**

LRT/BUS LINE	2000	2030 NO PROJECT/TSM	2030 ENHANCED EIS/EIR ALIGNMENT	2030 FOURTH / STOCKTON ALIGNMENT OPTION A (LPA)	2030 FOURTH / STOCKTON ALIGNMENT OPTION B (MODIFIED LPA)
CORRIDOR BOARDINGS					
RAIL					
T-Third Long Line ¹	N/A	60,030 <u>24,600</u> ⁴	59,710 <u>44,500</u>	60,670 <u>45,800</u>	65,830 <u>44,900</u>
T-Third Short Line	N/A	N/A	30,080 <u>18,900</u>	28,170 <u>19,000</u>	33,400 <u>18,900</u>
T-Third Very Short Line	N/A	N/A	<u>12,900</u>	<u>12,800</u>	<u>12,800</u>
Subtotal		60,030 <u>24,600</u>	89,790 <u>76,300</u>	88,840 <u>77,600</u>	99,230 <u>76,600</u>
BUS					
Line 15 ²	31,130 <u>28,300</u>	n/a <u>N/A</u>	n/a <u>N/A</u>	n/a <u>N/A</u>	n/a <u>N/A</u>
Lines 9X, 9AX, 9BX	9,320 <u>10,600</u>	29,560 <u>23,000</u>	30,790 <u>22,300</u>	30,760 <u>20,800</u>	24,770 <u>21,200</u>
Lines 30, 45 ³	52,420 <u>54,400</u>	57,860 <u>76,600</u>	42,030 <u>46,600</u>	42,510 <u>44,800</u>	38,290 <u>44,800</u>
Subtotal	92,870 <u>93,300</u>	87,420 <u>99,600</u>	72,820 <u>68,900</u>	73,270 <u>65,600</u>	63,060 <u>66,000</u>
TOTAL IN CORRIDOR:	92,870 <u>93,300</u>	147,450 <u>124,200</u>	162,610 <u>145,200</u>	162,110 <u>143,200</u>	162,290 <u>142,600</u>
Increase Over Existing:	0	54,580 <u>30,900</u>	69,740 <u>51,900</u>	69,240 <u>49,900</u>	69,420 <u>49,300</u>
Increase Over No Project/TSM:	0	0	15,160 <u>21,000</u>	14,660 <u>19,000</u>	14,840 <u>18,400</u>
SYSTEM BOARDINGS					
RAIL	209,510 <u>185,700</u>	280,550 <u>238,900</u>	303,190 <u>287,900</u>	311,730 <u>300,700</u>	320,630 <u>299,500</u>
BUS	543,240 <u>547,000</u>	585,470 <u>609,000</u>	590,450 <u>567,800</u>	575,760 <u>566,700</u>	566,290 <u>566,800</u>
TOTAL SYSTEM:	752,750 <u>732,800</u>	866,020 <u>848,800</u>	893,640 <u>855,700</u>	887,490 <u>867,400</u>	886,910 <u>866,300</u>
Increase Over Existing:	0	113,270 <u>116,050</u>	140,890 <u>122,900</u>	134,740 <u>134,600</u>	134,160 <u>133,500</u>
Increase Over No Project/TSM:	0	0	27,620 <u>6,900</u>	21,470 <u>18,600</u>	20,890 <u>17,500</u>

Notes: ¹ Central Subways T-Third long-line to Visitacion Valley, and T-Third short-line to 18th and Third Streets, and T-Third very short line to the Caltrain Station at Fourth and King Streets.
² 15-Third Line shifts to 9X-San Bruno or to the T-Third line.
³ 45 Union/Stockton extended into Mission Bay
⁴ Rail ridership on the K between The Embarcadero and the county line and on the N to The Embarcadero.
N/A Not Applicable
Ridership is defined as the number of passengers boarding.

Source: San Francisco Model, January 2007. Revised January 2008.

TABLE 3-9
ESTIMATED WEEKDAY RIDERSHIP
BY CENTRAL SUBWAY STATION
2030 CONDITIONS

STATION	2030 NO PROJECT /TSM	2030 ENHANCED EIS/EIR ALIGNMENT	2030 FOURTH / STOCKTON ALIGNMENT OPTION A (LPA)	2030 FOURTH / STOCKTON ALIGNMENT OPTION B (MODIFIED LPA)
Fourth and King	---	<u>20,250-15,700</u>	<u>20,670-19,100</u>	<u>19,520-17,400</u>
Fourth and Brannan	---	---	---	<u>6,670-3,000</u>
Third (between King and Townsend)	---	<u>2,990-4,000</u>	---	---
Moscone	---	<u>4,290-3,800</u>	<u>3,860-3,500</u>	<u>3,520-2,800</u>
Market Street	---	<u>30,540-28,300</u>	<u>32,620-29,400</u>	<u>38,510-28,600</u>
Union Square	---	<u>2,640-1,600</u>		
Chinatown	---	<u>6,570-6,200</u>	<u>8,190-8,300</u>	<u>8,050-8,000</u>
TOTAL IN CORRIDOR:	---	<u>67,280-59,600</u>	<u>65,340-60,300</u>	<u>76,270-59,800</u>
TOTAL IN CENTRAL SUBWAY	---	<u>43,900</u>	<u>41,200</u>	<u>42,400</u>

Note: An estimated ~~89~~67 percent of passenger activity at the Fourth and King Station is related to transfers from Caltrain and about ~~25 to 32~~49 percent of passenger activity at the Market Street or Union Square/Market Street Stations is related to transfers from BART to Muni at Powell Street Station.

Ridership is defined as the number of passengers boarding.

Central Subway total excludes the Fourth and King Station which is part of the T-third line.

Source: San Francisco Model, January 2007. Revised January 2008.

of San Francisco. If in the future, the Caltrain line is extended to the Transbay Terminal as proposed in Phase 2 (Downtown Extension) of the Transbay Terminal Improvements, ridership on the Central Subway line would likely be reduced by some portion of the ~~89~~67 percent. However, because the Downtown Extension is not included as part of the Regional Transportation Plan and currently has an estimated \$2 billion shortfall for implementation, the extension of Caltrain has not been assumed to be part of the transportation network by 2030 and a detailed analysis of the ridership impacts was not conducted (refer to Section 3.1.1 for the transportation improvements that are projected to be in place by 2030). The p.m. peak period ridership at each of the Central Subway stations on the key transit routes in the T-Third corridor is presented in Table 3-10.

Transit Travel Times

Table 3-11 presents TTin-vehicle travel time comparisons for selected trips using the 15-Third bus service (from 2000 before operation of the T-Third began) and travel times for selected trips under each of the alternatives. The total travel times include walk, wait, and ride (in-vehicle and out-of-vehicle) times.

Out-of-vehicle travel times are influenced by such factors as service headways, location of station access points, and depth of station. These out-of-vehicle travel times are accounted for in the model and the projected transit ridership.”

TABLE 3-10
2030 ESTIMATED P.M. PEAK PERIOD RIDERSHIP
FOR SELECTED ROUTES IN CORRIDOR

VOLUME	2000 BASE	2030 NO PROJECT / TSM ALIGNMENT	2030 ENHANCED EIS/EIR ALIGNMENT	2030 FOURTH / STOCKTON ALIGNMENT OPTION A (LPA)	2030 FOURTH / STOCKTON ALIGNMENT OPTION B (MODIFIED LPA)
T-Third Lines Central Subway/30	4,260 ---	1,950 11,590	19,020 26,990	16,710 27,110	19,720 26,820
9AX	1,680 1,490	710 1,810	610 1,670	610 1,610	610 1,620
9BX	720 940	1,080 1,900	1,000 1,570	970 1,550	970 1,570
9X	570 750	5,120 1,630	6,210 1,690	5,270 1,520	2,730 1,580
30	8,370	13,900	4,150	4,140	4,120
45	4,600	8,530	5,620	5,510	5,480

Note: The p.m. peak period is three-hour ridership.
 Ridership is defined as the number of passengers boarding.
 Source: San Francisco Model, January 2007. Revised January 2008.

TABLE 3-11
IN-VEHICLE TRAVEL TIMES FOR SELECTED TRANSIT TRIPS
EXISTING AND 2030 CONDITIONS
TRANSIT TRAVEL TIME (MINUTES)

ORIGIN-DESTINATION	2000	2030 NO PROJECT / TSM ALIGNMENT	2030 ENHANCED EIS/EIR ALIGNMENT	2030 FOURTH / STOCKTON ALIGNMENT OPTION A (LPA)	2030 FOURTH / STOCKTON ALIGNMENT OPTION B (MODIFIED LPA)
Fourth/King – Market Street	8.1	10.5	4.4 4.7	3.2 3.5	4.5 4.9
Market Street to Chinatown Station ²	3.7	6.5	2.3	1.1	1.4
Fourth/King – Chinatown Station ¹	11.8	17.0	7.0	4.6	6.3

Notes: ¹ The Chinatown Station is at Stockton/Clay for the Enhanced EIS/EIR and Fourth/Stockton Alignment Option A (LPA) Alternatives, and at Stockton/Washington for the Fourth/Stockton Option B (Modified LPA) Alternative.
² Market Street is the Market Street Station under Alternative 2 and the Union Square/Market Street Station under Alternatives 3A and 3B
 Source: PB/Wong, April 2007. Revised October 2007.

Alternative 1 – No Project/TSM

Operations and Cumulative Impacts

By 2030, the No Project/TSM Alternative transit ridership demand in the Corridor is expected to grow by nearly ~~60~~ 33 percent over existing conditions, due to employment and population growth in the South of

Market, Mission Bay, Bayview-Hunters Point, and the Financial districts (refer to Table 3-8). In the base year 2000, the San Francisco Model inputs indicate an estimated population of ~~58,000~~ 52,120 and estimated employment of ~~142,000~~ 280,700 jobs ~~within ¼ mile of~~ in the Central Subway Corridor (refer to Table 1-1). According to the San Francisco

Planning Department, SFCTA, and Association of Bay Area Government (ABAG) forecasts, the population is expected to grow to by approximately ~~83,000~~96,040 persons (plus ~~41~~84 percent) and the employment is expected to grow to ~~177,000~~335,030 jobs (plus ~~24~~19 percent) in the Central Subway Corridor. This growth can be compared to a county-wide projected population growth of approximately ~~18~~20 percent and employment growth of about ~~29~~28 percent, ~~demonstrating that the~~The rate of population growth in the project corridor exceeds the rate of growth citywide, though the employment growth is lower. This growth could increase travel demand and result in increased congestion on surface streets. The travel time of a transit trip between Fourth and King Streets and Chinatown would increase by 5.2 minutes when compared to existing conditions.

Corridor transit ridership demand would increase by about ~~54,580~~30,900 daily trips between 2000 and 2030 under the No Project/TSM Alternative. The daily rail ridership would increase by approximately ~~60,030~~24,600 trips over existing conditions, ~~but this would be offset by a reduction of~~and the daily bus ridership would increase by approximately ~~5,450~~6,300 trips (refer to Table 3-8). This reduction in bus increase in transit ridership would occur as a result of service changes that were implemented for the T-Third line, as well as growth in population and employment. Changes to transit services in the Corridor between the base year 2000 and the year 2030 TSM included:

- Implementation of Phase 1 of Third Street Light Rail Project. The Initial Operating Segment, which has been accepted by FTA as the TSM alternative for Central Subway analyses, provides at-grade rail transit service from the terminus at Sunnydale and Bayshore Boulevards at the San Francisco County line north to Fourth and Townsend Streets along Third Street. The T-Third line operates as an extension of the Castro shuttle with 7-minute frequencies in the a.m. and p.m. peak periods, 10-minute frequencies in the midday, and 12-minute frequencies in the evening.
- Elimination of the 15-Third line. The 15-Third line was replaced by the T-Third light rail line and expanded service on the 9X-San Bruno Express, the 30-Stockton, and the 45-Union/Stockton.
- Extension of the 9X/9AX/9BX-San Bruno Expresses: These routes were extended from Broadway north to the Kearny/North Point intersection and extended to the south from Mission Street to the Phelan Loop, to cover the portion of the 15-Third line that was eliminated and not replaced by T-Third service. The 9AX-San Bruno A Express and 9BX-San Bruno B Express provide peak hour, peak direction service only, operating at 10-minute headways. During the peak, the 9X-San Bruno Express provides reverse peak direction service with 12-minute headways and bi-directional service during the midday and evening at 12 and 15-minute headways, respectively.

- Extension of the 45-Union/Stockton: This route was extended from the 2006 (pre-T-Third) route to provide service to Mission Bay. It has 8-minute frequencies during the peak periods, 6-minute frequencies in the midday, and 20-minute frequencies in the evening.

In the No Project/TSM Alternative, service between the Caltrain station at Fourth and Townsend and Chinatown is provided by the 30-Stockton and 30-Stockton short line buses. This service is replaced by the Central Subway operations in the Build Alternative. An analysis of expected volumes and capacities on the 30-Stockton and 30-Stockton short line indicates that capacities would not be exceeded on this segment. However, capacities of the light rail vehicles operating along the Muni Metro Extension, which connects service between the Market Street subway and the T-Third line, may experience capacity issues for limited durations during the peak period due to capacity constraints on the segment between the Embarcadero Station and the Folsom/Embarcadero stop. The Muni 9AX/9BX-San Bruno Expresses are not expected to experience capacity issues, but capacity issues would arise on the 9AX-San Bruno Express, ~~with ridership on this the 9X-San Bruno Express routes~~ is forecast to increase from approximately ~~9,320-10,600~~ daily boardings to approximately ~~29,560-23,000~~ daily boardings between 2000 and 2030. Table 3-10 indicates a peak period demand of about ~~5,120-4,930~~ passengers ~~(at Fourth and Mission Streets)~~ on the 9X-San Bruno Express lines, which is a substantial increase over the 2000 ridership demand of approximately ~~570-3,180~~ passengers.

Mitigation Measures

To accommodate this projected demand for transit service, additional buses and increases in service levels for the 9X may be required. The 2030-ridership projections from the San Francisco model are “unconstrained” assuming full build out of Mission Bay and termination of Caltrain at Fourth and Townsend Streets. Actual ridership may vary from these projections if growth does not materialize or if the Caltrain is extended to the Transbay Terminal at some point in the future. Ridership patterns on the light rail and bus lines will be monitored following the implementation of the T-Third service and associated bus changes. When warranted by passenger demand, Muni will modify their service plans to allow an increase in transit capacity.

Alternative 2 – Enhanced EIS/EIR Alignment

Operations and Cumulative Impacts

Travel times between Fourth and King Streets and the Market Street Station would be ~~6-1-5.8~~ minutes faster and travel times between Fourth and King Streets and the Chinatown Station would be 10.0

faster in the Enhanced EIS/EIR Alternative than in the No Project/TSM Alternative due to the replacement of buses traveling in mixed-flow with trains traveling in a semi-exclusive or dedicated right-

of-way (refer to Table 3-11). When compared to the existing conditions the travel time between Fourth and King Streets and the Market Street Station would be ~~4.1~~ 3.4 minutes faster and ~~3.7~~ 4.8 minutes faster for the trip between Fourth and King Streets and the Chinatown Station.

As shown in Table 3-8, the proposed light rail line is expected to serve approximately ~~89,790~~ 76,300 trips per weekday in 2030, or ~~29,760~~ 51,700 more daily riders than served by the T-Third line in the No Project/TSM Alternative, primarily due to the more direct alignment providing connections to the Union Square and Market Street Stations and also due to travel time savings gained in the proposed tunnel. A large share of these travelers are persons with origins likely outside San Francisco who board the Central Subway at Fourth and King near the Caltrain Terminal ~~and alight along or board at~~ Market Street connecting from the BART system, as shown in Table 3-9. Overall boardings on routes serving the Third Street Corridor are expected to increase by approximately ~~15,160~~ 21,000 over the No Project/TSM Alternative or ~~69,740~~ 51,900 over existing conditions. The increase of ~~29,760~~ 51,700 rail boardings over the No Project/TSM Alternative would be offset ~~somewhat~~ by a decline in bus boardings in the corridor of approximately ~~14,600~~ 30,700.

The large numbers of travelers using the Enhanced EIS/EIR Alignment could exceed the capacity at some point in the future. The combined peak load on the T-Third long, ~~T-Third short~~, and T-Third very short lines is predicted to be ~~19,020~~ 26,990 riders by 2030, assuming ~~56~~-minute headways (refer to Table 3-11). The service provided by two-car trains on the T-Third very short line and one-car trains on the T-Third long ~~and short~~ lines may need to be supplemented in the future as growth occurs to meet Muni planning capacity standards. These capacity issues may be substantially alleviated if the Caltrain Downtown Extension were implemented (the Caltrain Extension was not included in the networks because it was not part of the fiscally constrained RTP). As was the case with the No Project/TSM Alternative, demand projected for ~~9~~AX-San Bruno Express line may exceed capacity by 2030. Ridership on ~~this the 9X-San Bruno Express routes~~ is forecast to increase to ~~6,210~~ 4,930 passengers ~~(at Fourth and Mission Streets)~~.

Mitigation Measures

In 2030, passenger demand could slightly exceed the capacity of proposed light rail vehicle and bus services during certain peak hours. The 2030-ridership projections from the San Francisco model are “unconstrained” assuming full build-out of Mission Bay and termination of Caltrain at Fourth and Townsend Streets. As noted in the Mitigation Measures for the No Project/TSM Alternative, actual ridership may vary from these projections if growth does not materialize or if the Caltrain is extended to

the Transbay Terminal at some point in the future. Ridership patterns on the light rail line will be monitored following the implementation of the service. When warranted by passenger demand, Muni

will increase the number, frequency, and/or size of trains and buses through modification of the operating plan to allow an increase in capacity.

Alternative 3 – Fourth/Stockton Alignment Option A (LPA)

Operations and Cumulative Impacts

Travel times between Fourth and King Street Station and the Union Square/Market Street Station are assumed to be 1.2 minutes faster in Fourth/Stockton Alignment Option A than in the Enhanced EIS/EIR Alignment and 2.4 minutes faster between Fourth and King Streets and the Chinatown station due to the straightening out of the route and a reduction in the number of stops. ~~and~~ The travel time between the Fourth and King Street Station and the Chinatown Station would be 12.4 minutes faster than under the No Project/TSM Alternative (refer to Table 3-11). When compared to existing conditions, travel times from Fourth and King Streets would be ~~4.9~~ 4.6 minutes faster to Market Street and 7.2 minutes faster to Chinatown Station.

As shown in Table 3-8, when compared to the No Project/TSM Alternative, the Fourth/Stockton Alignment Option A is projected to serve about ~~88,840~~ 77,600 trips per weekday in 2030, or ~~28,810~~ 53,000 more daily riders than served by the T-Third line operating along The Embarcadero. This is primarily due to the more direct alignment providing connections to the Union Square/Market Street Station and also due to the travel time savings gained in the proposed tunnel. ~~This is slightly fewer passengers than served~~ 1,300 more passengers than by the Enhanced EIS/EIR Alternative, as Though Option A provides slightly faster travel times, ~~with~~ the reduction in the number of stops increases the walk time to stations and a more direct alignment. ~~This out-of-vehicle time is often perceived by travelers to be more onerous than time spent riding in vehicles.~~ As was the case with the Enhanced EIS/EIR Alternative, a large share of the users of the Central Subway ~~are likely~~ have trip origins outside San Francisco; boarding the Central Subway at the Fourth and King Station after getting off Caltrain and ~~alighting at or~~ Market Street transferring from the BART system (refer to Table 3-9). When compared to the No Project/TSM Alternative, overall boardings on routes serving the Third Street Corridor are expected to increase by approximately ~~14,660~~ 19,000 over the No Project/TSM Alternative or ~~69,240~~ 49,700 over the existing conditions. The increase of ~~28,810~~ 53,000 rail boardings over the No Project/TSM Alternative would be offset by a decline in bus boardings of approximately ~~14,150~~ 34,000.

As observed in the Enhanced ~~EIS/EIR~~ EIS/EIR Alternative, the large numbers of travelers using the Fourth/Stockton Alignment Option A could exceed the capacity by 2030. The combined peak load on

the T-Third long, T-Third short, and T-Third very short lines is predicted to be ~~16,710~~27,110 riders (refer to Table 3-10). To meet the Muni planning capacity standards, additional service may be required as development occurs. As previously noted, these capacity issues would be substantially alleviated if the Caltrain Downtown

Extension were implemented. Once again, capacity issues may arise on the 9AX-San Bruno Express. Table 3-10 indicates a peak load of about ~~5,270~~ 4,680 passengers on the 9X-San Bruno Express lines (at Fourth and Mission Streets). The Powell Street Station may also experience capacity issues at the concourse level due to increased passenger activity at the northeast end of the station.

Mitigation Measures

Mitigation measures would be the same as those outlined under Alternative 2, except as noted below.

SFMTA and BART will prepare and enter into a Station Improvement Coordination Plan for the Powell Street Station that will provide for, at a minimum, implementation of and allocation of cost for any station infrastructure improvements necessary to maintain pedestrian safety and a pedestrian level of service of D or better at the Powell Street Station as a result of the Central Subway Project.

Alternative 3 – Fourth/Stockton Alignment Option B (Modified LPA)

Operations and Cumulative Impacts

For the Fourth/Stockton Alignment Option B, travel time between the Fourth and King Station and the Union Square/Market Street Station is estimated to be ~~1.3~~ 1.4 minutes slower and travel time between Fourth and King Streets and the Chinatown Station would be 1.7 minutes slower than in Fourth/Stockton Alignment Option A due to the presence of an additional stop in SOMA, but travel times between Fourth and King Streets and Chinatown 10.7 minutes faster than under the No Project/TSM Alternative (refer to Table 3-11). When compared to existing conditions, travel times from Fourth and King Streets would be ~~3.6~~ 3.2 minutes faster to Market Street and 5.5 minutes faster to Chinatown Station.

The light rail line in the Fourth/Stockton Alignment Option B is expected to serve approximately ~~99,230~~ 76,600 trips per weekday in 2030, or ~~39,200~~ 52,000 more daily riders when compared to the No Project/TSM Alternative (refer to Table 3-8). It serves ~~10,390~~ more ~~1,000~~ fewer passengers or one percent less than served by the light rail train in the Fourth/Stockton Alignment, Option A Alternative, primarily due to the ~~additional access provided by~~ slightly slower travel times resulting from the proposed surface station on Fourth Street. The bus ridership is projected to decline on lines serving the Corridor, such as the 9X/9AX/9BX- San Bruno Expresses, 30-Stockton, and 45-Union/Stockton, as well as other lines serving Downtown San Francisco and SOMA as a result of the Central Subway Project implementation. As was the case with the Enhanced EIS/EIR Alternative and Fourth/Stockton Alignment Option A, a large share of the users of the Central Subway are expected to have trip origins

outside San Francisco, transferring to the Central Subway at Fourth and King Station (from Caltrain) ~~and alighting or~~ at Market Street transferring from the BART system (refer to Table 3-9). When compared to the No Project/TSM Alternative, overall transit boardings on routes serving the Third Street Corridor are expected to increase by approximately ~~14,840~~ 18,400 over the No Project/TSM Alternative or ~~69,420~~ 49,300 over existing conditions. The increase of ~~39,200~~ 52,000 rail boardings over the No Project/TSM Alternative would be offset by a decline of ~~24,360~~ 33,600 bus boardings.

~~The Fourth/Stockton Alignment Option B has the highest Central Subway ridership of the four alternatives evaluated and b~~By 2030 the large numbers of travelers using the Central Subway could exceed the capacity during the peak hours under the Fourth/Stockton Alignment Option B (refer to Tables 3-9 and 3-10). Table 3-10 indicates that the peak load

on the combined T-Third light rail lines, is projected to be ~~19,720~~ 26,820 by 2030. Assuming the use of Muni planning capacity standards, additional rail service may be required to meet demand as development along the Corridor and to the south of San Francisco occurs. For the Fourth/Stockton Alignment Option B, the 9X-San Bruno Express demand would be less than under ~~all other a~~ Alternatives 2. This is due to a shift in passengers disembarking at the Fourth and Harrison Streets and Fifth and Harrison Street stops, from the 9X-San Bruno Express and other lines, to the T-Third light rail line stop at Fourth and Brannan Streets. The 9AX-San Bruno Express line could experience capacity issues. The Powell Street Station may also experience capacity issues at the concourse level due to increased passenger activity at the northeast end of the station.

Mitigation Measures

Mitigation measures would be the same as those outlined under ~~Alternative-2~~ 3A.

3.2.2 TRAFFIC

A project is considered to have a significant traffic impact when project-related traffic causes the intersection level of service to deteriorate from LOS D or better to LOS E or F, or from LOS E to LOS F or if the project substantially contributes to increased delays at intersections already operating at LOS E or F. A project would also have a significant impact if it would cause major traffic hazards or contribute considerably to cumulative traffic increase that would cause deterioration in levels of service to unacceptable levels.

Future Traffic Conditions

This section discusses the methodology used to develop future year (2030) traffic projections and vehicle travel times for the Central Subway Alternatives.

Growth in Vehicular Traffic Trips

The development of 2030 background traffic conditions was based on the San Francisco County Transportation Authority's (SFCTA's) travel demand model (San Francisco Model). The San Francisco Model is typically used to obtain estimates of travel volumes and patterns within San Francisco. The activity-based model simulating trip tours is able to quantify shifts in travel patterns and modal splits due to changes in conditions such as: roadway configurations, land uses, travel times, transit accessibility, traffic congestion, and parking costs.

The San Francisco Model forecasts traffic volumes for street segments or links, but not for intersections. The forecasted traffic growth for each street segment in the Study Area (based on 2000 and 2030 model

runs) was added to existing traffic volumes to obtain 2030 No Project /TSM traffic projections. Then,

based on existing travel patterns and proposed development access points, manual adjustments were made to develop 2030 peak hour turning movement projections for the Study Area’s five intersections.

Table 3-12 summarizes the expected 2030 traffic volumes along the I-80 and I-280 Freeway Corridors, Geary and Stockton Streets, and Third and Fourth Streets, between Mission Creek and Market Street. Traffic volumes are expected to increase on all key street segments in the Study Area in the future with the exception of Third Street between King and Townsend Streets in the a.m. peak hour. This reduction is expected to result from increased use of the Sixth and Brannan Streets off-ramp from I-280 by northbound traffic.

**TABLE 3-12
PROJECTED 2030 WEEKDAY TRAFFIC INCREASES
UNDER THE NO PROJECT/TSM ALTERNATIVE**

LOCATION	A.M. PEAK HOUR EXISTING	A.M. PEAK HOUR 2030	A.M. PEAK HOUR INCREASE	P.M. PEAK HOUR EXISTING	P.M. PEAK HOUR 2030	P.M. PEAK HOUR INCREASE
Interstate 280:						
Between 18 th & Sixth Streets	11,440	12,500	+1,060	11,340	12,150	+810
Between Sixth & Fifth Streets	2,490	3,280	+790	2,470	4,510	+2,040
Interstate 80:						
Between Fourth & Second Streets	13,740	18,660	+4,920	11,560	14,860	+3,300
Third Street:						
Between King & Townsend Streets	1,050	850	-200	1,720	2,830	+1,110
Between Harrison & Folsom Streets	2,060	N/A	N/A	1,770	2,120	+350
Fourth Street:						
Between King & Townsend Streets	780	1,780	+1,000	1,160	1,640	+480
Between Harrison & Folsom Streets	1,450	1,770	+320	1,770	2,390	+620
King Street:						
Between Fourth & Third Streets	2,730	3,210	+480	3,510	3,830	+460
Between Third & Second Streets	2,410	3,380	+970	2,590	3,410	+820
Geary Street:						
Between Powell & Stockton Streets	1,190	1,570	+380	1,640	2,340	+710
Stockton Street:						
Between Market/Ellis & O’Farrell Streets	980	2,030	+1,050	1,120	2,240	+1,120
Between Geary & Post Streets (Union Square)	1,410	1,710	+300	1,750	2,020	+270

N/A = Not Available

Source: San Francisco, Department of Parking and Traffic and San Francisco Model, 2007.

Intersection Levels of Service and Traffic Travel Speeds

The future peak hour service levels were estimated for each study intersection. The service level calculations considered each alternative's future turning volumes; number, type and width of approaching lanes; travel speeds; and signal phasing, including consideration of special phases used for light rail vehicles. Tables 3-13 and 3-14 summarize the projected levels of service for each alternative for key intersections in the Study Area. The projected levels of service were generated from the TRAFFIX model using input for traffic volumes, signal timing, and lane configurations at each intersection. A significant impact would occur if a project or cumulative development to which the project contributes causes an intersection operating at LOS A, B, C or D to deteriorate to LOS E or F conditions. Intersection delays associated with LOS F are represented in the tables as greater than 80 seconds. Tables E-12 and E-13 in Appendix E include the percent contributions of the No Project/TSM and the Build Alternatives' Project-related traffic as a percent of total 2030 Cumulative traffic volumes, and the project-related traffic as a percent of only the increase in traffic volumes between Existing and 2030 Cumulative conditions. This calculation is presented only for the intersections that would operate at LOS E or LOS F under 2030 Cumulative conditions.

TABLE 3-13**2030 A.M. INTERSECTION LOS / AVERAGE SECONDS OF DELAY**

INTERSECTION	EXISTING	NO PROJECT / TSM ALTERNATIVE	ENHANCED EIS/EIR ALTERNATIVE	FOURTH / STOCKTON ALTERNATIVE OPTION A (LPA)	FOURTH / STOCKTON ALTERNATIVE OPTION B (MODIFIED LPA)
Third Street / King Street	D/ 36.1 <u>D/ 35.8</u>	D/ 47.1 <u>E/61.0</u>	F/>80.0	F/>80.0	F/>80.0
Fourth Street / King Street	E/ 55.9	E/ 69.5	D/ 40.0 <u>E/ 62.6</u>	E/ 64.6 <u>E/64.1</u>	E/ 58.6¹ <u>E/64.1¹</u>
Fourth Street / Harrison Street	B/ 13.2 <u>B/ 13.5</u>	E/ 66.5 <u>C/28.0</u>	C/ 31.5 <u>C/34.8</u>	C/ 31.2 <u>C/34.8</u>	F/ 75.7 <u>C/34.1</u>
Sixth Street / Brannan Street	F/>80.0	F/>80.0	F/>80.0	F/>80.0	F/>80.0
Fourth Street / Bryant Street	B/ 11.8 <u>B/ 18.9</u>	B/ 11.8 <u>B/ 19.0</u>	C/ 23.8 <u>C/ 23.4</u>	C/ 28.2 <u>C/ 27.7</u>	D/ 52.5 <u>D/51.7</u>

Bold shows Project related impact.

¹ The level of service presented here is for the semi-exclusive flow option. The level of service under the mixed-flow option would be LOS D.

Source: San Francisco Department of Parking and Traffic, November 2006, February 2007, and March 2007. Revised February 2008.

TABLE 3-14
2030 P.M. INTERSECTION LOS

INTERSECTION	EXISTING	NO PROJECT / TSM ALTERNATIVE	ENHANCED EIS/EIR ALTERNATIVE	FOURTH / STOCKTON ALTERNATIVE OPTION A (LPA)	FOURTH / STOCKTON ALTERNATIVE OPTION B (MODIFIED LPA)
Third Street / King Street	F/>80.0	F/>80.0	F/>80.0	F/>80.0	F/>80.0
Fourth Street / King Street	F/>80.0	F/>80.0	F/>80.0	F/>80.0	F/>80.0 ¹
Fourth Street / Harrison Street	<u>B/ 19.5</u> <u>B/ 18.5</u>	<u>C/ 27.6</u> <u>C/ 27.0</u>	<u>D/ 35.8</u> <u>D/35.3</u>	<u>E/ 65.2</u> <u>E/64.6</u>	F/>80.0²
Sixth Street / Brannan Street	F/>80.0	F/>80.0	F/>80.0	F/>80.0	F/>80.0
Fourth Street / Bryant Street	<u>C/ 20.7</u> <u>B/19.6</u>	<u>C/ 30.9</u> <u>C/30.4</u>	<u>B/ 18.5</u> <u>B/ 18.2</u>	<u>D/ 39.5</u> <u>C/ 24.4</u>	<u>D/ 37.3</u> <u>D/ 36.9</u>

Bold shows Project related impact.

1 The level of service presented here is for the mixed-flow and semi-exclusive option.

2 The level of service presented here is for the semi-exclusive option. The level of service for the mixed-flow option would be LOS E.

Source: San Francisco Department of Parking and Traffic, November 2006, February 2007, and March 2007. Revised February 2008.

Table 3-15 summarizes existing average travel speeds and 2030 travel speeds for the Project Alternatives. The travel speeds for existing conditions were collected using the average car method as recommended in the Manual of Transportation Engineering Studies, a publication of the Institute of Transportation Engineers (ITE). Each arterial segment was surveyed three times per segment in both the a.m. and p.m. peak periods. Upon completion of the three surveys for each segment, the average speed of each run conducted was calculated. To conform to recommended procedures established by ITE, the calculated average speed data was used to verify that the minimum sample size was satisfied. If these surveys were found to be insufficient, additional travel time runs on specific segments were completed to conform to the ITE procedure. Travel speeds for the build alternatives were generated from the TRAFFIX model using the urban streets methodology from the HCM (Chapter 15, HCM 2000).

Alternative 1 – No Project/TSM

Operations and Cumulative Impacts

Under the No Project/TSM Alternative, the roadway network in 2030 would be similar to existing conditions, with the exception of the roadway changes within the proposed Mission Bay development.

Two of the intersections, Third/King and Fourth/Harrison and Fourth/Bryant, intersections would operate at

TABLE 3-15**TRAFFIC P.M. PEAK PERIOD TRAVEL SPEED COMPARISON**

LOS / AVERAGE SPEED (MPH)

ROUTE	EXISTING	2030 NO PROJECT / TSM ALTERNATIVE	2030 ENHANCED EIS/EIR ALTERNATIVE	2030 FOURTH/ STOCKTON ALTERNATIVE OPTION A (LPA)	2030 FOURTH/ STOCKTON ALTERNATIVE OPTION B (MODIFIED LPA)
<i>Fourth Street:</i>					
King to Brannan Streets	E/ 7.2	F/ 5.8	F/ 3.1	F/ 4.5	F/ 7.0
Brannan to Bryant Streets	D/ 12.1	D/ 9.1	E/ 9.0	F/ 6.0	D/ 9.3
Bryant to Harrison Streets	B/ 22.6	E/ 8.2	D/ 10.0	F/ 6.9	F/ 4.8

Source: Department of Parking and Traffic, February 2007, and Transportation Research Board, *Highway Capacity Manual 2000*, Exhibit 15-2, 2000.

acceptable levels of service, LOS ~~D-C~~ and B, respectively, in the a.m. peak hour and both the Bryant and Harrison Street intersections with Fourth Street would operate at LOS C during the p.m. peak hour. As ~~under existing conditions, many Three~~ of the Study Area intersections would operate at LOS E, or worse, conditions during the a.m. and p.m. peak period. LOS E or F conditions would occur at the following intersections under the No Project/TSM Alternative (refer to Tables 3-13 and 3-14):

- Third Street/King Street would degrade from LOS D to LOS E during the a.m. peak hour and continue to operate at LOS F during the p.m. peak hour with increased delays due to increases in traffic volumes on all approaches,
- Fourth Street/King Street would remain at LOS E during the a.m. peak hour and LOS F during the p.m. peak hour with increases in traffic volumes on all approaches, except on the eastbound through movement in the a.m. peak hour, where congestion would limit the traffic flows, and
- ~~Fourth Street/Harrison Street would degrade from LOS B to LOS E during the a.m. peak hour with significant increase in traffic volume to the I-80 on-ramp, and~~
- Sixth Street/Brannan Street would continue to operate at LOS F during a.m. and p.m. peak hours but would experience increased delays in the p.m. peak hour.

Mitigation Measures

Given the constrained roadway space available and limited opportunities for roadway restriping or signal enhancements, none of the LOS E and F intersections, ~~except for the Fourth and Harrison Streets~~

~~intersection Third/King, Fourth/King and Sixth Brannan Streets, could be reasonably mitigated and are therefore considered cumulative, unavoidable adverse impacts.—At the Fourth/Harrison Streets intersection, the following mitigation measure is recommended:~~

- ~~• Fourth Street/Harrison Street: In 2030, the Fourth/Harrison Street intersection would degrade to LOS E conditions during the a.m. peak hour; however, the intersection’s performance could be improved to LOS B conditions by adding, via striping changes, a shared through and right turn lane from Fourth Street to Harrison Street. This improvement would require parking removal on the east side of Fourth Street, from Harrison Street to a point about 200 feet to the north for lane transition purposes. Signal timing changes would also help improve the operating conditions by allocating the appropriate amount of green time to all approaches.”~~

Alternative 2 – Enhanced EIS/EIR Alignment

Operations and Cumulative Impacts

For the Enhanced EIS/EIR Alignment, Third and Fourth Streets between King and Bryant Streets would be reconfigured to accommodate the light rail tracks, station platforms, and subway portals.

On Third Street, between King and Townsend Streets, three through (one-way northbound) and one right-turn only traffic lanes on the approach to Townsend Street would be situated on the east side of the street and the exclusive lane for the light rail tracks and a curbside station would be located on the west side. Between Townsend and Brannan Streets, the light rail tracks transition toward the middle of the street en route to the subway portal as part of a mixed-flow vehicle and track lane, and the western most through traffic lane would transition further west, crossing the light rail tracks, so that from just south of Brannan Street to the portal, two traffic lanes would exist on the east side of the tracks and one traffic lane on the west side. The middle through traffic lane would transition into the mixed-flow vehicle and track lane. No existing turning movements would be prohibited. With the inclusion of light rail, this segment of Third Street would provide three traffic lanes at all times (note that it currently provides a fourth lane during the a.m. peak hour for the right-turn only lane). Northbound traffic on this block of Third Street can access either side of the street by crossing the mixed-flow vehicle and track lane. On Third Street between Brannan and Bryant Street, the mixed-flow vehicle and track lane would transition into a portal in the middle of the street, with two northbound traffic lanes on the east side of the portal and two northbound traffic lanes on the west side of the portal. On this block of Third Street, the properties on the east side of Third Street would be accessed from the two northbound traffic lanes on the

east side of the portal, and the properties on the west side of Third Street would be accessed from the two northbound traffic lanes on the west side of the tracks.

Under this alternative, Fourth Street would remain one-way southbound between Bryant and Townsend Streets, with a portal in the center of the street between Bryant and Brannan Streets. Between Bryant and Brannan Streets, the buildings on the east side of Fourth Street would be accessed from the two southbound traffic lanes on the east side of the portal, and the buildings on the west side of Fourth Street would be accessed from the two southbound traffic lanes on the west side of the portal. On Fourth Street between Brannan and Townsend Streets, two southbound traffic lanes would exist on both sides of the light rail tracks with the track from the portal transitioning into a mixed-flow vehicle and track lane. In addition, southbound traffic can access either side of the street by crossing the mixed-flow vehicle and track lane. At Townsend Street, the eastern two lanes would be diverted onto Townsend to establish an eastbound one-way bus lane and loading zone on the west side of Fourth Street in front of the Caltrain Terminal. On Fourth Street between Townsend and King Streets, there would be three traffic lanes in the southbound direction, including a left turn only lane shared with the tracks, and one northbound traffic lane with a right-turn only regulation at Townsend Street.

Properties along Fourth Street between Bryant and Townsend Streets would have direct access from the eastbound Interstate 80 off-ramp at Fourth and Bryant Streets and access to the Interstate 280 on-ramp via the intersection at Fifth Street/King Street.

On Fourth Streets, the light rail would travel in a mixed-flow traffic lane, except along the track lane on the west side of Third Street between Townsend and King Streets, where the platform stop is located. All intersections would be re-graded to conform to the trackway.

Under Alternative 2, the Third and King Streets intersection would degrade from LOS ~~D-E~~ to LOS F and the Fourth and Bryant Streets intersection would degrade from LOS B to LOS C in the a.m. peak hour with the implementation of the Project. This would result in a significant project impact for the Third/King Streets intersection. The LOS operating conditions for the other three intersections would remain the same, with the Fourth/King Streets intersection experiencing slightly fewer delays than under the No Project/TSM Alternative and the Fourth/Harrison and Sixth/Brannan Streets intersections experiencing slightly higher delays. Cumulative unavoidable adverse impacts are expected to occur at Third Street/King Street intersection in the a.m. peak hour., ~~Fourth Street/King Street (p.m. peak hour only), and Sixth Street/Brannan Street under the No Project/TSM Alternative as these intersections are expected to perform at LOS E or F conditions during the a.m. and/or p.m. peak hours.~~

Implementation of the Enhanced EIS/EIR Alignment would result in a degradation of level of service from LOS C to LOS D at the Fourth Street/Harrison Street intersection and exacerbate the congested

LOS F operations during the p.m. peak hours at Third Street/King Street, ~~Fourth Street/King Street~~, and Sixth Street/Brannan Street intersections, ~~but~~ At the Fourth/Bryant Streets intersection, the level of service would improve from LOS C to LOS B with Alternative 2. Alternative 2 would make a considerable contribution to the cumulative congestion only at the Sixth/Brannan Streets intersection. At the Sixth Street/Brannan Street intersection, Alternative 2 would increase delays for vehicles accessing the I-280 on- and off-ramps. The Project would not make a considerable contribution to the cumulative adverse impacts at the other two intersections. At the Third Street/King Street intersection, the increase in the northbound left turns ~~that~~ would cause greater delays than under the No Project/TSM Alternative. At Fourth Street/King Street, the overall traffic volume and delays are ~~is~~ slightly less than the

No Project/TSM Alternative, ~~but the increase in eastbound left turns could cause delays to increase. During the a.m. peak hours, the LOS operating conditions for two of the intersections remain the same, but would experience slightly fewer delays than under the No Project/TSM Alternative.~~ The Fourth Street/King Street intersection would operate as a constraint to traffic traveling southbound on Fourth Street.

No long-term traffic impacts would be anticipated north of the subway portals since the project would not change traffic lane configurations or increase traffic levels north of Bryant Street.

Mitigation Measures

Project-related unavoidable adverse impacts are expected to occur at the Third/King Streets intersection. Cumulative unavoidable adverse impacts, which cannot be reasonably mitigated are expected to occur by 2030, with or without the Project, at Third Street/King Street, Fourth Street/King Street, and Sixth Street/Brannan Street intersections. Alternative 2 would make a considerable contribution to the cumulative impacts at the Sixth/Brannan Streets intersection in the p.m. peak hour.

Alternative 3 – Fourth/Stockton Alignment Option A (LPA)

Operations and Cumulative Impacts

For the Fourth/Stockton Alignment Option A (LPA), Fourth Street between King and Brannan Streets would be reconfigured to accommodate the light rail tracks and subway portal.

Under this alternative, Fourth Street would remain one-way southbound between Bryant and Townsend Streets. On Fourth Street between Brannan and Townsend Streets, two southbound traffic lanes would exist on the west side of the light rail tracks and one southbound traffic lane on the east side. At Townsend Street, the eastern southbound lane would be diverted onto Townsend Street to establish a northbound one-way bus lane and loading zone on the east side of Fourth Street in front of the Caltrain Terminal, between Townsend and King Streets.

On Fourth Street, the light rail would travel in a semi-exclusive four- to six-inch raised right-of-way between Townsend and King Streets for both northbound and southbound directions, It would then transition to a portal between Townsend and Brannan Streets. All intersections would be re-graded to conform to the raised trackway.

Access to the Interstate 280 on-ramp from the properties on the east side of Fourth Street between Brannan and Townsend Streets would be restricted. Southbound traffic originating from these properties

would have to turn left onto eastbound Townsend Street, right onto southbound Second Street, right onto westbound King Street, then to the on-ramp at Fifth and King Streets.

Under Alternative 3A, the Third Street/King Street intersection would degrade from LOS ~~D-E~~ to LOS F in the a.m. peak hour and the Fourth Street/Harrison Street intersection would degrade from LOS C to LOS E in the p.m. peak hour with the implementation of the Project, resulting in a significant project impact. The Fourth Street/Bryant Street intersection would degrade from LOS B to LOS C in the a.m. peak hour and would remain at LOS C in the p.m. peak hour, but would still operate at an acceptable level of service. Third/King, Fourth/King, and Sixth/Brannan streets intersections are expected to continue to operate at LOS E or F in the a.m. and p.m. peak hours. Cumulative unavoidable adverse traffic impacts are expected to occur at Third Street/King Street (a.m. peak hour), Fourth Street/King Street (a.m. and p.m. peak hour), and Fourth Street/Harrison Street (a.m. and p.m. peak hour). These intersections are expected to perform at LOS E or F conditions during the a.m. and/or p.m. peak hours with or without the Fourth/Stockton Alignment Option A (LPA), but Alternative 3A would have a considerable contribution to the cumulative impacts at these intersections in the p.m. peak hour. Implementation of light rail would exacerbate the congested operations at the Fourth Street/King Street intersection during the p.m. peak hours with increases in the eastbound through volumes contributing to the increase in delays. At Third Street/King Street, the increases in eastbound left turn movements would contribute to the increased delays at the intersection and at the Fourth Street/Harrison Street intersection, the increase in southbound right turn movements resulting from Alternative 3A would contribute to the increased congestion. At the Sixth Street/Brannan Street intersection, the LOS operating conditions would remain at LOS F during the a.m. and p.m. peak hours, but would experience slightly ~~fewer~~ higher delays ~~than under the No Project/TSM Alternative~~ with the reduction in southbound lanes.

No long-term traffic impacts would be anticipated north of the subway portals since the Project would not change traffic lane configurations or increase traffic levels north of Brannan Street, except for the Fourth Street/Harrison Street intersection.

Mitigation Measures

To mitigate intersection operation impacts under the Fourth/Stockton Alignment Option A (LPA), the following mitigation measure is recommended:

- Fourth Street/Harrison Street: With the Fourth/Stockton Alignment Option A (LPA), the Fourth/Harrison Street intersection would degrade to LOS E conditions during the p.m. peak hour due to heavy right turns from Fourth Street to Harrison Street. However, the intersection's p.m. peak

hour performance could be improved to LOS B conditions by adding, via striping changes, a shared through and right-turn lane from Fourth Street to Harrison Street. This improvement would require parking removal on the east side of Fourth Street, from Harrison Street to a point about 200 feet to the north for lane transition purposes. Signal timing changes would also help improve the operating conditions by allocating the appropriate amount of green time to all approaches.

Project-related unavoidable adverse impacts are expected to occur at the Fourth/Harrison Streets and Third/King Streets intersections. Cumulative unavoidable adverse traffic impacts, which cannot be reasonably mitigated are expected to occur by 2030, with and without the light rail project, at Third Street/King Street, and Fourth Street/King Street, ~~and Fourth Street/Harrison Street~~. Alternative 3A would have a considerable contribution to these cumulative impacts in the p.m. peak hour.

Alternative 3 – Fourth/Stockton Alignment Option B (Modified LPA)

Operations and Cumulative Impacts

For the Fourth/Stockton Alignment Option B (Modified LPA), Fourth Street between King and Harrison Streets would be reconfigured to accommodate the light rail tracks, station platform, and subway portal.

Under this alternative, Fourth Street between Townsend and Bryant Streets would be converted from one-way southbound to two-way operation, with a portal in the center of the street underneath the Interstate 80 overpass between Harrison and Bryant Streets. This alternative will include one surface station between Brannan and Bryant Streets. On Fourth Street between Bryant and King Streets, two southbound traffic lanes would exist on the west side of the light rail tracks and one northbound traffic lane on the east side. The northbound lane would be diverted eastbound at Bryant Street with a right-turn only restriction.

There are two suboptions for lane configurations on Fourth Street under the Fourth/Stockton Alignment Option 3B. The semi-exclusive suboption would have light rail on Fourth Street in a semi-exclusive four-to six-inch raised right-of-way, or curbs along the trackway, between Brannan and King Streets for both northbound and southbound directions. On Fourth Street between Brannan and Bryant Streets, the track right-of-way would be semi-exclusive in the northbound direction and mixed-flow in the southbound direction. The trackway would then transition to a portal between Harrison and Bryant Streets underneath the Interstate 80 freeway overpass. All intersections would be re-graded to conform to the trackway.

The mixed-flow suboption would have light rail on Fourth Street in mixed-flow lanes between Bryant and King Streets for both northbound and southbound directions, providing for one additional lane of travel for northbound traffic. As with the semi-exclusive track lane option, the trackway would transition to a portal between Harrison and Bryant Streets underneath the Interstate 80 freeway overpass, and all intersections would be re-graded to conform to the trackway.

Alternative 3B provides direct access from Interstate 280 to properties on the west side of Fourth Street between Townsend and Bryant Streets. In order to access Interstate 280 from the properties on the east side of Fourth Street, traffic must make a right turn onto eastbound Bryant or Brannan, right onto

southbound Second Street, right onto King Street, then to the Interstate 280 on-ramp at Fifth and King Streets. Left turns from Fourth Street at intersections and at mid-block locations for both northbound and southbound would be prohibited.

Access to the proposed Transbay Terminal bus storage facilities underneath the Interstate 80 freeway on the blocks bounded by Second, Third, Fourth, Stillman, and Perry Streets would be provided through Second, Third, and Fourth Streets. ~~Because of the location of~~ The portal on Fourth Street at Perry Street, under the Interstate 80 freeway, has been located to accommodate the bus access from southbound Fourth Street to the bus storage facility ~~may be restricted due to the tight turning radius~~. The portal may also however, restrict turn movements of larger trucks (40-foot or greater wheelbase) to Stillman Street ~~for the same reasons~~.

For Alternative 3B, when compared to the No Project/TSM Alternative, the LOS at the Third Street/King Street intersection would degrade from LOS ~~D-E~~ to LOS F in the a.m. peak hour and the operation of the Fourth Street/Harrison Street intersection would degrade from ~~LOS E to LOS F in the a.m. peak hour and from~~ LOS C to LOS F in the p.m. peak hour as a result of the Project implementation. The intersection of Fourth/Bryant Streets would degrade from LOS B to LOS D in the a.m. peak hour and from LOS C to LOS D in the p.m. peak hour, but would continue to operate at acceptable levels of service. The intersections of Third/King (a.m. peak hour changes from LOS E to LOS F), Fourth/King, and Sixth Brannan would continue to operate at LOS E or LOS F in the peak hours. Cumulative unavoidable adverse impacts are expected to occur at Third Street/King Street (a.m. and p.m. peak hour), Fourth Street/Harrison Street (p.m. peak hour only), and Fourth Street/King Street (p.m. peak hour only) intersections. Implementation of light rail would exacerbate ~~their~~ congested operations at these locations during the p.m. peak hours with either ~~of the~~ semi-exclusive or mixed-flow street configurations. These locations would experience greater delays in this alternative than in the No Project/TSM Alternative due to overall increases in traffic volumes, ~~as noted under Alternative 3A,~~ resulting in a considerable contribution to the cumulative impacts.

The LOS operating conditions at the critical intersections remain the same or degrade one level of service during the a.m. peak hours, and would also experience moderately longer delays than under the No Project/TSM Alternative, except at Fourth Street/King Street intersection where overall traffic volumes are less than those under the No Project/TSM Alternative. The increased traffic at the Third/King Streets

intersection resulting from Alternative 3B will also result in a considerable contribution to the cumulative impacts.

The only differences in the level of service between the semi-exclusive and mixed-flow track lane options are at Fourth/King Streets and Fourth/Harrison Streets. In the a.m. peak, Fourth/King Streets performs at LOS E for the semi-exclusive track option, while it operates at LOS D in the mixed-flow option. In the p.m. peak, Fourth/Harrison Streets intersection performs at LOS F for the semi-exclusive option and LOS E for the mixed-flow option. The improvement in the level of service for the mixed-flow option could be attributed to the added capacity of the mixed-flow lane, which would be used by both the LRVs and automobile traffic.

No long-term traffic impacts would be anticipated north of the subway portals, except for Fourth Street/Harrison Street, since the project would not change traffic lane configurations or increase traffic levels north of Harrison Street.

Mitigation Measures

Mitigation measures would be the same as those described under Alternative 3A except as noted below. To address the tight turn radius issues at ~~Perry-Stillman-Street~~, MTA is currently investigating ~~reducing the portal length and shifting its location southward to allow buses and~~ with Caltrans, the TJPA and Golden Gate Transit the possibility of allowing trucks to enter Perry-Stillman Street from Fourth Street under the Caltrans I-80 structure via the bus storage facility. ~~Other possible options evaluated were to locate the subway portal opening at the immediate³ north side of the Fourth Street/Bryant Street intersection and to design the incline of the tracks in the portal with a steeper grade or to shift the portal westerly by 13 feet, which would also include shifting of the two westerly traffic lanes and the west sidewalk further west. The relocation of the west sidewalk would encroach into the Caltrans right-of-way. All of these options would provide adequate space on the east side of Fourth Street to allow buses and trucks to access Perry and Stillman Streets.~~ Other possible options not yet identified may also be considered as part of the coordination process with the Transbay Terminal project team. When the preferred option is selected, it would be included into the design ~~of the portal~~ for this Project.

3.2.3 FREIGHT AND LOADING

This section discusses the potential environmental consequences to truck movement under each of the alternatives. A project would have a significant effect on the environment if it would 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 created potentially hazardous conditions or significant delays affecting traffic, transit, bicycles or pedestrians.

Alternative 1 – No Project/TSM

Operations and Cumulative Impacts

By 2030, traffic is expected to increase on all major streets throughout the Corridor except Third Street, immediately north of the I-280 off-ramp in the a.m. peak hour (refer to Table 3-11). The increased congestion would impact all traffic flows, including private autos, trucks, and buses.

The No Project/TSM Alternative would not disproportionately affect truck freight movements. Trucks would be subject to the same amount of increase in delays at intersections and in overall travel times as automobiles.

Mitigation Measures

No mitigation measures would be required.

Alternative 2 – Enhanced EIS/EIR Alignment

Operations and Cumulative Impacts

The light rail station platform on Third Street at King Street, the surface alignment along Third and Fourth Streets, and the subway portals would displace some on-street parking, including loading zones between King and Bryant Streets. The removal of existing on-street loading zones (3 on Third Street, 2 on Fourth Street) would require re-establishment of loading zones in areas where parking would be allowed on Third and Fourth Streets and/or on nearby side streets. If no convenient spaces were available, double-parking of trucks may occur. At the Union Square Station, sidewalk bulb-outs would be constructed on Stockton Street, north and south of Maiden Lane, to provide stair and escalator entries eliminating five or six truck parking spaces. The loss of existing loading zone spaces on Stockton Street at the Union Square and Chinatown Stations would not be re-established since there are already nearby loading zones at these locations.

Mitigation Measures

During final design of the Enhanced EIS/EIR Alignment, areas for new, permanent, on-street loading zones may be identified along Third and Fourth Streets (between King and Bryant Streets) and appropriate side streets. Some of the new loading zones may need to displace existing parking spaces.

Alternative 3 – Fourth/Stockton Alignment Option A (LPA)

Operations and Cumulative Impacts

The surface alignment along Fourth Street and the location of the subway portal would displace some on-street parking, including loading zones between King and Brannan Streets. The removal of existing on-street loading zones would require re-establishment of loading zones in areas where parking would be allowed on Fourth Street and/or on nearby side streets. If no convenient spaces were available, double-parking of trucks may occur. The placement of vent shafts for the Union Square/Market Street Station would result in the loss of two to three loading zones on Stockton Street, south of Maiden Lane, and the bulb-out for stairway access to the station would displace three loading zones on Stockton Street, south of Maiden Lane. Two loading zone spaces would also be lost on the east side of Stockton Street between Clay and Washington Streets to provide room for the emergency access hatch at the Chinatown Station.

Mitigation Measures

Mitigation measures would be the same as those described above under Alternative 2, except as noted below.

The proposed location of the combined northbound and southbound portals on Fourth Street on the block between Brannan and Townsend Streets would require the relocation of the existing 45-foot long white loading zone and the adjacent two 22-foot long yellow metered loading zones located on the east side of Fourth Street approximately 39-feet south of Brannan Street. These loading zones currently serve the multi-story commercial building at 601 Fourth Street (The Lofts) on the southeast corner of Fourth and Brannan Streets. This building's loading zone should be relocated to a location around the corner on the south side of Brannan Street just east of Fourth Street. These improvements should be considered during the development of the Project's final plans.

Alternative 3 – Fourth/Stockton Alignment Option B (Modified LPA)

Operations and Cumulative Impacts

Provision of the light rail station platform on Fourth Street at Brannan Street, the surface alignment along Fourth Streets, and the location of the subway portal would displace some on-street parking, including loading zones between King and Harrison Streets. The removal of existing on-street loading zones would require re-establishment of loading zones in areas where parking would be allowed on Third and Fourth Streets and/or on nearby side streets. Approximately four loading zones spaces would be removed on the west side of Stockton Street between Washington and Jackson Streets at the Chinatown Station to provide space for the emergency access hatch. If no convenient spaces are available, double-parking of trucks may occur. The access to Stillman Street for larger trucks (40-foot wheelbase and above) would be restricted under this alternative due to the location of the portal.

Mitigation Measures

Mitigation measures would be the same as those described above under Alternative 2, except as noted below. To address the tight turn radius issues at Stillman Street, MTA is currently investigating with Caltrans, the TJPA and Golden Gate Transit the possibility of allowing trucks to enter Stillman Street from Fourth Street under the Caltrans I-80 structure via the bus storage facility. Other possible options not yet identified may also be considered as part of the coordination process with the Transbay Terminal project team. When the preferred option is selected, it would be included into the design for this Project.

3.2.4 PARKING

San Francisco does not consider parking supply as part of the permanent physical environment. Parking conditions are not static, as parking supply and demand varies from day to day, from day to night, from month to month, etc. Hence, the availability of parking spaces (or lack thereof) is not a permanent physical condition, but changes over time as people change their modes and patterns of travel.

In San Francisco, parking deficits are considered to be social effects, rather than impacts on the physical environment as defined by CEQA. Under CEQA, a project's social impacts need not be treated as significant impacts on the environment. Environmental documents should, however, address the secondary physical impacts that could be triggered by a social impact. (CEQA Guidelines § 15131(a).) The social inconvenience of parking deficits, such as having to hunt for scarce parking spaces, is not an environmental impact, but there may be secondary physical environmental impacts, such as increased traffic congestion at intersections, air quality impacts, safety impacts, or noise impacts caused by congestion. In the experience of San Francisco transportation planners, however, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxis, bicycles or travel by foot) and a relatively dense pattern of urban development, induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to transit service in particular, would be in keeping with the City's "Transit First" policy. The City's Transit First Policy, established in the City's Charter Section 16.102 provides parking policies for areas well served by public transit.

The transportation analysis accounts for potential secondary effects, such as cars circling and looking for a parking space in areas of limited parking supply, by assuming that all drivers would attempt to find parking at or near the project site and then seek parking farther away if convenient parking is unavailable. The secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to others who are aware of constrained parking conditions in a given area. Hence, any secondary environmental impacts which may result from a shortfall in parking in the vicinity of the proposed project would be minor, and the traffic assignments used in the transportation analysis, as well as in the associated air quality, noise and pedestrian safety analyses, reasonably addresses potential secondary effects.

Future Parking Conditions

The following assessment is based on current parking demands and supplies in the Corridor and considers parking that would result from implementation of the alternatives. It does not forecast parking demands or evaluate parking impacts associated with other future developments; only those attributable to the Project. However, the assessment provides estimates of surplus parking throughout the Corridor.

Table 3-16 quantitatively summarizes the parking impacts on a segment-by-segment basis (Table E-10 in Appendix E provides quantified parking information on a block-by-block basis). Although individual

TABLE 3-16

2030 PARKING CONDITIONS IN CORRIDOR

APPROXIMATE NUMBER OF ON-STREET PARKING SPACES

SEGMENT	NO PROJECT / TSM ALTERNATIVE		ENHANCED EIS/EIR ALTERNATIVE		FOURTH / STOCKTON ALTERNATIVE OPTION A (LPA)		FOURTH / STOCKTON ALTERNATIVE OPTION B (MODIFIED LPA)	
Third Street - Total 92 Spaces								
	Spaces Remaining	Spaces Lost	Spaces Remaining	Spaces Lost	Spaces Remaining	Spaces Lost	Spaces Remaining	Spaces Lost
King to Townsend Streets	23	0	0	-23	23	0	23	-0
Townsend to Brannan Streets	35	0	35	0	35	0	35	-0
Brannan to Bryant Streets	34	0	0	-34	34	0	34	-0
Fourth Street - Total 85 Spaces								
King to Townsend Streets	0	0	0	0	0	0	0	-0
Townsend to Brannan Streets	20	0	20	0	2 NB/SB Portal	-18	Semi-Exclusive 0 <u>2</u>	Semi-Exclusive -20 <u>-18</u>
							Mixed-Flow 5	Mixed-Flow -15
Brannan to Bryant Streets	36	0	0	-36	36	0	Semi-Exclusive 7	Semi-Exclusive -29
							Mixed-Flow 3 <u>7</u>	Mixed-Flow -33 <u>-29</u>
Bryant to Harrison Streets	29	0	29	0	29	0	Both 0	Both -29
Stockton Street - Total 26 Spaces								
Geary to Post Streets	10	0	2	-8	5	-5	10	-0
Clay to Washington Streets	14	0	4	-10	8	-6	10	-4
<u>Washington to Jackson Streets</u>	<u>20</u>	<u>0</u>	<u>20</u>	<u>0</u>	<u>20</u>	<u>0</u>	<u>18</u>	<u>-2</u>
TOTAL CORRIDOR	204 <u>221</u>	0	90 <u>110</u>	-111	172 <u>192</u>	-29	Semi-Exclusive 119 <u>139</u>	Semi-Exclusive -82
							Mixed-Flow 120 <u>142</u>	Mixed-Flow -81 <u>-79</u>

Source: San Francisco Department of Parking and Traffic, May 2007 and January 2008.

NOTE: Under Alternative 3B up to three parking spaces would potentially be removed on the north side of Ellis Street to accommodate the expansion of One Stockton Street (the Apple Store) access/egress into the public sidewalk area.

parking spaces are not delineated along much of the Corridor, estimates were made of overall parking capacities based on field measurements and observations.

Alternative 1 – No Project/TSM

Operations and Cumulative Impacts

The No Project/TSM Alternative would not displace any additional parking spaces. Although additional bus service would be proposed under the No Project/TSM Alternative, none of Muni's bus zones along the Corridor would need to be extended (thereby displacing on-street parking spaces) to accommodate the increased bus service.

Mitigation Measures

This alternative would not result in any significant impacts, therefore no mitigation is required.

Alternative 2 – Enhanced EIS/EIR Alignment

Operations and Cumulative Impacts

The Enhanced EIS/EIR Alignment would impact on-street parking along Third and Fourth Streets between King Street and the proposed subway portals, in the Hearst and Union Square parking garages, as well as near the proposed Chinatown station entrances.

The proposed location of the light rail tracks, platforms, and subway portal on Third Street would remove 57 of the existing 92 on-street parking spaces between King and Bryant Streets (refer to Table 3-16). On Fourth Street, all 36 spaces would be eliminated between Brannan and Bryant Streets to accommodate the light rail facilities. Parking would be retained on the blocks between Brannan and Townsend Streets and between Bryant and Harrison Streets.

On Stockton Street between Geary and Post Streets at the Union Square Station, 8 out of 10 parking spaces would be lost due the space occupied by the station portals. At the Chinatown Station on Stockton Street between Clay and Washington Streets, 10 of the 14 parking spaces would be lost due to the new emergency access hatch located on the northwest corner of Clay and Stockton Streets and station access as described below.

Overall, the Enhanced EIS/EIR Alignment would displace 111 parking spaces. Since on-street parking spaces along the Corridor and along nearby streets are usually at or near full occupancy during the day, it is unlikely that many of the displaced spaces could be reclaimed by relocation to another nearby location.

The Enhanced EIS/EIR Alignment would have four subway stations: Moscone Center, Market Street, Union Square, and Chinatown. The escalators, elevators and stairs serving the Moscone Center and Market Street stations are proposed to be located in off-sidewalk areas where feasible, in property to be

acquired by Muni, so parking would not be affected. However, due to the narrow right-of-way of Stockton Street in Chinatown and at Union Square, a portion of the curbs and sidewalks would need to be extended to accommodate the station's entries. Eight on-street parking spaces, a passenger loading zone, and a freight loading area would be eliminated due to the extensions at the Chinatown Station and another eight parking spaces at the Union Square Station. Most of these parking spaces are metered and used for truck loading. One of the spaces is located in front of the Post Office at the corner of Stockton and Clay Streets and is reserved for government vehicles. Parking in these areas is often at full-occupancy. In addition, 30 parking spaces in the Hearst Garage at 45 Third Street and 29 out of 985 parking spaces in the Union Square parking garage would be eliminated to accommodate the vent shafts and station access points.

Mitigation Measures

San Francisco has a "transit first" policy, and the displacement of existing automobile parking spaces is not considered a substantial impact requiring mitigation. However, the impacts could be alleviated or reduced with the following mitigation measures.

To improve the accessibility to businesses in the Corridor, it is recommended that retained and added (where applicable) parking spaces be designated for short-term parking and loading, especially in commercial districts. Near commercial establishments, parking turn-over should be encouraged through the use of time limits (e.g., parking meters, signed restrictions, etc.). These improvements would be incorporated into the development of the project's final plans.

Alternative 3 – Fourth/Stockton Alignment Option A (LPA)

Operation and Cumulative Impacts

The Fourth/Stockton Alignment Option A (LPA) would impact on-street parking along Fourth Street between King Street and the proposed subway portals near Brannan Street, at the Union Square Station, as well as the proposed Chinatown station entrance on Stockton Street.

The proposed location of the light rail tracks and subway portal on Fourth Street would remove 18 of the 20 existing on-street parking spaces between Townsend and Brannan Streets (refer to Table 3-16).

On Stockton Street between Geary and Post Streets at the Union Square Station, 5 out of 10 parking spaces would be lost due the space occupied by the station entrances. At the Chinatown Station on Stockton Street between Clay and Washington Streets, 6 of the ~~16~~14 parking spaces would be lost due to the new emergency access hatch located on the west side of the street and the station emergency stairs.

Overall, the Fourth/Stockton Alignment Option A (LPA) would displace 29 on-street parking spaces. Since on-street parking spaces along the Corridor and along nearby streets are usually at or near full occupancy during the day, it is unlikely that many of the displaced spaces could be reclaimed on other close-in streets.

The Fourth/Stockton Alignment Option A (LPA) would have three subway stations: Moscone, a combined Union Square/Market Street Station, and Chinatown Station. The escalators, elevators and stairs serving the stations are proposed to be located in off-sidewalk areas where feasible in property to be acquired by Muni, so parking would not be affected. However, due to the narrow right-of-way of Stockton Street in Chinatown, a portion of the curbs and sidewalks would need to be extended to accommodate the station's primary entrance. Four on-street parking spaces would be eliminated due to the sidewalk extensions. All of these parking spaces are metered. Parking in this area is often at full-occupancy. In addition to on-street parking loss, the Fourth/Stockton Alignment Option A would result in the loss of 29 off-street spaces out of 985 spaces at the Union Square garage to accommodate vent shafts and station access.

Mitigation Measures

The mitigation measures would be the same as those described for Alternative 2.

Alternative 3 – Fourth/Stockton Alignment Option B (Modified LPA)

Operations and Cumulative Impacts

The Fourth/Stockton Alignment Option B (Modified LPA) alignment would impact on-street parking along Fourth Street between King Street and the proposed subway portals, just south of Harrison Street beneath I-80, in the Union Square Station area, and near the proposed Chinatown Station entrances.

The Fourth/Stockton Alignment Option B (Modified LPA) alignment also involves the modification of Fourth Street from a one-way street to a two-way street between Townsend and Bryant Streets. In addition, this alternative also includes a new center-platform surface-level station between Bryant and Brannan Streets.

The proposed location of the light rail tracks, platforms, and subway portal on Fourth Street would remove ~~82-76~~ of the 85 existing on-street parking spaces (east side and west side) under the semi-exclusive option and ~~84-73~~ spaces under the mixed-flow option between Townsend and Harrison Streets (refer to Table 3-16).

There would be a loss of three parking spaces on the north side of Ellis Street, west of Stockton Street, to accommodate the potential widening of the existing station access/egress at One Stockton Street (the Apple Store) and ~~four~~ six parking spaces near the Chinatown Station to accommodate emergency access to the station.

Overall, the Fourth/Stockton Alignment Option B (Modified LPA) would displace 82-79 parking spaces on Fourth and Stockton Streets and an additional three spaces on Ellis Street. Since on-street parking spaces along the Corridor and along nearby streets are usually at or near full occupancy during the day, it is unlikely that many of the displaced spaces could be relocated to other nearby streets.

The Fourth/Stockton Alignment Option B (Modified LPA) would have one surface platform stop and three subway stations: 1) the surface platform stop between Brannan and Bryant Streets (500 block of Fourth Street), 2) Moscone Center, 3) the combined station serving Market Street and Union Square, and 4) Chinatown.

The escalators, elevators and stairs serving the Moscone, Union Square/Market Street, and Chinatown stations are proposed to be located off-sidewalk, where feasible, on property that would be acquired by Muni or through the use of encroachment permits, so parking would not be affected. However, due to the narrow right-of-way of Stockton Street in Chinatown, a portion of the curbs and sidewalks would need to be extended to accommodate the station's primary entrance and the emergency stairway access. Four on-street parking spaces would be eliminated due to the extensions. All of these parking spaces are metered. Parking in this area is often at full-occupancy. In addition, 25 parking spaces out of 950 would be eliminated from the Ellis/O'Farrell garage and 34 out of 985 off-street parking spaces would be eliminated in the Union Square parking garage due to placement of vent shafts (Ellis/O'Farrell) and station elevators and escalator access (Union Square).

Mitigation Measures

Mitigation measures would be the same as described for Alternative 2.

3.2.5 PEDESTRIANS

This section describes the potential environmental consequences to pedestrian circulation under each of the alternatives. A project would have an effect on the environment if it would 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.

To project the future pedestrian volumes at the critical station entrance location a three-step process was undertaken. First, existing three-hour peak period pedestrian counts were factored with a growth factor (originating from the San Francisco Model) to account for the projected increases in pedestrian trips to

and from the Study Area at each of the proposed subway station locations. Second, future pedestrian volumes were added to the projected station ridership at each proposed entrance to give a projected total pedestrian volume at that location. Third, the total volume was converted into an equivalent 15-minute count to be used in the Highway Capacity Manual (HCM) methodology (Chapter 18) to calculate the pedestrian level of service on sidewalks. According to the results from the pedestrian counts, the existing pedestrian levels of service at all proposed station entrances, which currently operate at LOS A, would continue to operate at LOS A except on Stockton Street at Maiden Lane at the Union Square Station for Alternative 3A and along Stockton Street at the proposed Chinatown Station for Alternative 3B where sidewalks would operate at LOS B (see Table 3-17).

Alternative 1 – No Project/TSM

Operations and Cumulative Impacts

Under the No Project/TSM Alternative, the sidewalks along the Corridor would not be changed. No sidewalk improvements would be undertaken along the Central Subway Corridor nor would sidewalk narrowing occur.

Mitigation Measures

These alternatives would not result in any significant impacts, therefore no mitigation is required.

Alternative 2 – Enhanced EIS/EIR Alignment

Operations and Cumulative Impacts

Under the Enhanced EIS/EIR Alignment, the sidewalk widths on Third and Fourth Streets between Townsend and Brannan Streets would remain the same at 10 feet, and at two of the four proposed subway station locations, the effective walkway widths along the sidewalks (i.e., portion of sidewalk that can be effectively used for pedestrian movements) would be reduced to provide access stairways, escalators, and elevators.

Each of the proposed subway stations would be accessed via stairways, escalators, and elevators descending from the sidewalk area to the subway's mezzanine and platform levels. When provided within an existing sidewalk, subway access points reduce the effective sidewalk width available for pedestrians. The existing sidewalks near the proposed subway stations currently experience moderate to heavy pedestrian volumes and the subway stations would contribute additional pedestrian traffic. Emergency exits are located away from the main station entrances and usually require a sidewalk bulb

out to accommodate a steel hatch to access the exit. However, the establishment of these exits does not affect pedestrian access on the sidewalks.

**TABLE 3-17
EXISTING AND PROJECTED PEDESTRIAN LEVEL OF SERVICE
AT PROPOSED STATION ENTRANCES**

Alternative	Intersection	Corner	Street	Existing LOS	Existing 15-minute count ¹	3-hr PM Peak Period PM peak period count	3-hr PM Peak Period Projected 2030 Pedestrian Volumes	3-hr PM Peak Period Projected Ridership Volumes at Portal ²	Projected Total 15-min Ped Volume at Portal	Effective Walkway Width (ft)	Ped Unit Flow Rate (ped/min/ft)	LOS
2	Market Street Station											
	Third/Market	SW	Market	A	431	5172	7086	3565-3250	888-861	22.00	2.61	A
	Third/Market	SE	Market	A	523	6276	8598	3565-3250	1014-987	16.50	4.10-3.99	A
	Union Square Station											
	Stockton/Maiden Lane	NE	Stockton	A	262	3144	4307	380-270	391-381	5.81	4.47-4.38	A
	Stockton/Maiden Lane	SE	Stockton	A	261	3132	4291	380-270	389-380	7.81	3.31-3.24	A
	Chinatown Station											
	Stockton between Sacramento and Clay	Mid	Stockton	A	179	2148	2943	1255-1350	350-358	7.00	3.33-3.41	A
Hang Ah Alley (south of Clay)	Mid	Hang Ah	A	27	324	444	1255-1350	142-149	11.00	0.86-0.81	A	
3A	Moscone Station											
	Fourth/Howard ³	NE	Fourth	A	121	1452	1989	0	166	7.60	1.43	A
	Fourth/Howard	NW	Fourth	A	96	1152	1578	600-570	182-179	13.00	0.93-0.92	A
	Fourth/Howard	NW	Howard	A	72	864	1184	600-570	149-146	14.00	0.71-0.70	A
	Union Square/Market Street Station											
	Stockton/Maiden Lane	NE	Stockton	A	262	3144	4307	380-1750	391-505	6.50	4.01-5.18	A-B
Stockton/Maiden Lane	SE	Stockton	A	261	3132	4291	380-1750	389-503	8.50	3.05-3.95	A-B	

3.0 TRANSPORTATION ANALYSIS - ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

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**TABLE 3-17 (CONTD.)
EXISTING PEDESTRIAN LEVEL OF SERVICE
AT PROPOSED STATION ENTRANCES**

Alternative	Intersection	Corner	Street	Existing LOS	Existing 15-minute count ¹	3-hr PM Peak Period PM peak period count	3-hr PM Peak Period Projected 2030 Pedestrian Volumes	3-hr PM Peak Period Projected Ridership Volumes at Portal ²	Projected Total 15-min Ped Volume at Portal	Effective Walkway Width (ft)	Ped Unit Flow Rate (ped/min/ft)	LOS
	Chinatown Station											
	Stockton between Sacramento and Clay	Mid	Stockton	A	179	2148	2943	1675 -1950	<u>385408</u>	7.00	3.66 -3.88	A
	Hang Ah Alley (south of Clay)	Mid	Hang Ah	A	27	324	444	1675 -1950	<u>177-199</u>	11.00	1.07 -1.21	A
3B	Chinatown Station											
	Stockton/Geary	NE	Geary	A	238	2856	3913	2990 -2230	<u>575-512</u>	9.10	4.22 -3.75	A
	Stockton/Washington	SW	Stockton	A	193	2316	3173	3130 -3700	<u>525-573</u>	7.00	5.00 -5.45	B

Note: Pedestrian Growth Factor = 1.37

¹ Counts conducted April 2007, Analysis updated April 2008.

² Total projected station ridership (p.m. peak period) divided by the number of station exits. See Table E-11 (Appendix E) for total projected station ridership during the p.m. peak period.

³ Proposed station elevator location.

Access to the proposed Moscone Station would be via two sets of stairs, two sets of escalators, and an elevator on the east side of Third Street between Clementina and Howard Streets (refer to Figure 2-7). The station entrance itself would be located within the private Tehama Street right-of-way, in an open space between two buildings (687 Folsom Street and 255 Third Street). The space between the two buildings is approximately 40 feet wide, which is more than enough room to accommodate the station entrance and meet the minimum Americans with Disabilities Act (ADA) 6-foot requirement. Since the station entrance is set back from the public sidewalk on Third Street, it would not have an effect on the effective width of the sidewalk. The emergency exit would be located on the north side of Clementina Street east of Third Street, with a hatch, which would also not affect the effective width of the sidewalk on Clementina Street.

Access to the proposed Market Street Station would be via two sets of stairs, two sets of escalators, and an elevator at two entrances on the south side of Market Street, east and west of Third Street (refer to Figure 2-8). The existing sidewalk on Market Street is 30 feet wide, with effective widths of 22.0 feet and 25.0 feet on the west and east side of Third street, respectively, adjacent to the subway access points. The effective sidewalk width would be reduced to 16.5 feet east of Third Street. These sidewalks would be adequate to handle pedestrian flows during peak periods. Pedestrian analysis for future conditions shows that the sidewalks at the station entrances would operate at LOS A. Two emergency access hatches would be located on Third Street at Jessie Street, one on each side of the street. The hatches would not affect the effective width of the sidewalks on Third Street.

Access to the proposed Union Square Station would be provided by one set of stairs and one escalator on the east side of Stockton Street and two sets of escalators and two elevators on the west side of Stockton Street (refer to Figure 2-9). In addition, a pedestrian connection between the station's mezzanine and the Union Square garage elevators would be established. Stockton Street's east side sidewalks are 15 feet wide (with a 7.0 foot effective width north of Stockton Street and a 9.0 foot effective width south of Stockton Street), but with the station access points, the sidewalks would be extended (bulbed-out) in order to accommodate the station entrances, with an increase to almost 20 feet wide. The east side sidewalk's effective width would be 5.8 feet north of Stockton Street and 7.8 feet south of Stockton Street feet adjacent to the subway access points. The west side sidewalk, which is also 15 feet wide, would have its effective width unaffected since the station entrance is within Union Square. The emergency exit would be located on the east side of Stockton Street north of Post Street, with a hatch within the sidewalk, but would not affect the effective width of the sidewalk on Stockton Street. Pedestrian analysis for future conditions indicates that the sidewalks on the east side of Stockton Street where the station entrances are

located would operate at LOS A. Pedestrian traffic through Union Square to access the station entry would increase. (See also Section 4(f) Report, Section 10.0)

Due to the narrow widths of Stockton Street sidewalks near Clay Street (9.5 to 11 feet with an effective width of 7.0 feet), it is proposed that the Chinatown Station's main access point be located off the sidewalk on property to be acquired by Muni, thereby maintaining the existing effective sidewalk widths and minimizing pedestrian overcrowding on the sidewalk. It is also proposed that the emergency access hatch be located at the northwest corner of Clay and Stockton Streets within an extended sidewalk or bulb-out. Since the curb lane on the west side of Stockton Street is not used as a travel lane, this would not reduce lane capacity (refer to Figure 2-10). The extended sidewalk/bulb-out would, however, eliminate on-street parking, as previously discussed. The pedestrian level of service would remain at LOS A with these measures in the vicinity of the Stockton/Clay intersection. A secondary access proposal via Hang Ah Alley would increase considerably the pedestrian volumes on this alley under the jurisdiction of San Francisco Recreation and Parks Department, but the alley would still operate at LOS A.

Mitigation Measures

During final design, consideration should be given to widening Stockton Street sidewalks near the proposed Union Square Station and/or using narrower stairways and escalators. Although the pedestrian LOS analysis indicates the sidewalks on the east side of Stockton Street between Post and Geary Streets operate without congestion, the presence of commercial and retail business and their seasonal impacts of attracting shoppers may impact pedestrian circulation on the sidewalks and would warrant such consideration of using narrower stairways and escalators. Trade-offs between pedestrian circulation impacts and traffic and parking impacts will be further evaluated during final design.

At the proposed Chinatown Station, efforts should be made to minimize pedestrian circulation impacts on Stockton Street and on streets adjacent to the station, where the placement of merchandise along storefronts on sidewalks in Chinatown is commonplace. Enforcement by DPW to keep sidewalks clear of such merchandise near the station entrances should be considered a priority to maintain adequate pedestrian circulation.

During final design, elevators would be located so as to not obstruct sight lines for motorists entering the major street from side streets, alleys, and driveways, or vice versa. For example, the proposed elevator on the east side of Third Street serving the Moscone Station would be located so as not to block sight lines for motorists exiting the adjacent parking garage. The proposed elevator could be located within the parking structure to minimize any visual impacts to motorists. Likewise, the proposed elevators on the

west side of Third Street at Market Street would be located away from the corner, preferably further south along Third Street, so that the sight lines for motorists on Third Street would not be impeded from pedestrians and motorists crossing Third Street. Consideration would also be given to locating elevators inside adjacent private buildings or plazas for the Moscone and Market Street Stations. In all cases, efforts would be made to locate elevators as close as possible to the primary circulation path of the majority of transit patrons in order to minimize unnecessary long distances traveled by wheelchair users. Similar considerations would be given to the locations of stairways and escalators.

Alternative 3 – Fourth/Stockton Alignment Option A (LPA)

Operations and Cumulative Impacts

Under the Fourth/Stockton Alignment Option A (LPA), the proposed station entrances would narrow the sidewalks at the Union Square/Market Street and Moscone stations and the effective walkway widths along the sidewalks (i.e., portion of sidewalk that can be effectively used for pedestrian movements) would be reduced to provide access stairways, escalators, and elevators. Sidewalks would not be narrowed at the remaining station locations.

At the proposed subway portal located on Fourth Street between Brannan and Townsend Streets, the sidewalk widths would remain unaffected on this block. Since there would be no reduction in sidewalk width, it is not expected that pedestrian crowding would occur during peak periods, particularly along Fourth Street's sidewalks before and after major events at the Ballpark.

Each of the proposed subway stations would be accessed via stairways, escalators, and elevators descending from the sidewalk area to the subway's mezzanine and platform levels. When provided within an existing sidewalk, subway access points reduce the effective sidewalk width available for pedestrians. The existing sidewalks near the proposed subway stations currently experience moderate to heavy pedestrian volumes and the subway stations would contribute additional pedestrian traffic. Emergency exits are located away from the main station entrances and typically require a sidewalk bulb out to accommodate a steel hatch to access the exit. However, the establishment of these emergency exits does not affect pedestrian access on the sidewalks. Provision of stairways, escalators, and elevators would substantially reduce the effective sidewalk widths near two of the three proposed subway stations, potentially resulting in crowded pedestrian conditions near the access points and along the adjacent sidewalks, the same as described for Alternative 2.

Access to the proposed Moscone station would be via two sets of stairs, three sets of escalators, and an elevator (refer to Figure 2-13). The existing public sidewalk is 17 feet wide (with an 11-foot effective

width) on the east side of Fourth Street, north of Howard Street, and 18 feet wide (with a 15-foot effective width) on the west side of Fourth Street between Clementina and Folsom Streets. The sidewalk's effective width would be 7.6 feet adjacent to the elevator at Fourth and Howard Streets, and the sidewalk would operate at LOS A. The resulting sidewalk width at the elevator would still conform to ADA guidelines and meet the 6-foot minimum clear space policy contained in San Francisco's *Downtown Streetscape Plan*. On the Fourth Street west sidewalk between Clementina and Folsom Streets, the sidewalk's effective width would remain unchanged at 15 feet since the stairs and escalators to the station would be located in a headhouse off of Fourth Street and the sidewalk would operate at LOS A. The station entrance on the west side of Fourth Street, north of Howard Street (15-foot effective width), and on the north side of Howard Street, west of Fourth Street (14-foot effective sidewalk width), are located on sidewalks along the frontage of Moscone West where there is walkway space within the private right-of-way in addition to the sidewalk to accommodate heavy pedestrian traffic. Pedestrian analysis for future conditions shows that the sidewalks next to these station access points would operate at LOS A.

Access to the proposed Union Square/Market Street Station would be provided by one set of stairs to Post Street, one escalator to Geary Street, two sets of escalators to the Union Square plaza, and one elevator to the upper concourse at Union Square (refer to Figure 2-14). A separate set of escalators and stairs would connect to the existing Powell Street BART/Muni Metro Station at the south end of the mezzanine level. In addition, a pedestrian connection between the station's mezzanine and the Union Square garage elevators would be established. Stockton Street's east side sidewalks are 15 feet wide, but with the station entrances established, the sidewalks would be extended to almost 20 feet in order to accommodate the entrances. Therefore, the east side sidewalk's effective width would be between 6.5 and 8.5 feet adjacent to the subway access points. The west side sidewalk, which is also 15 feet wide, would have its effective width remain unchanged since pedestrian access to the station from the west side of Stockton Street would take place within Union Square. Pedestrian analysis for future conditions indicates that the sidewalks on the east side of Stockton Street where the station access points are located would operate at LOS A-B. Pedestrians would be likely to cut across Union Square to reach the station entry on the east side of the Square. (See also Section 4(f) Report, Chapter 10.0)

Due to the narrow widths of Stockton Street sidewalks near Clay Street (9.5 to 11 feet with an effective sidewalk width of 7.0 feet), it is proposed that the Chinatown Station's main access point be located within an off-street station property, thereby maintaining the existing effective sidewalk widths and minimizing pedestrian overcrowding on the sidewalk. There would also be an extension of the west sidewalk to accommodate an emergency hatch on Stockton Street between Clay and Sacramento Streets that would impact on-street parking, as previously discussed, but would not create pedestrian

overcrowding. Since the curb lane on the west side of Stockton Street is not used as a travel lane, this would not reduce lane capacity (refer to Figure 2-15). The pedestrian level of service would remain LOS A in the vicinity of the Stockton/Clay intersection. As noted under Alternative 2, pedestrian volumes would increase considerably on Hang Ah Alley with the proposed secondary station entrance, but the alley would continue to operate at LOS A.

Mitigation Measures

The pedestrian LOS analysis indicates the sidewalks on the east side of Fourth Street north of Howard Street and on the north side of Howard Street west of Fourth Street would operate without congestion with the proposed station elevator (east side of Fourth Street) and stairway (west side of Fourth Street). However, the presence of Moscone Center and the high volumes of visitors to scheduled events may impact pedestrian circulation on the sidewalks and would warrant consideration of alternative station entrance locations within the Moscone Center right-of-way.

At the proposed Chinatown Station, efforts would be made to minimize pedestrian circulation impacts on Stockton Street and on streets adjacent to the station, where the placement of merchandise along storefronts on sidewalks in Chinatown is commonplace. Enforcement by DPW to keep sidewalks clear of such merchandise should be considered a priority to maintain adequate pedestrian circulation.

During final design, consideration should be given to using narrower stairways and escalators, and to ensure enough space is reserved in the landing area at the escalators to provide for adequate pedestrian flow with the sidewalks at stations. Consideration should also be given to widening Stockton Street's sidewalks near the proposed Union Square/Market Street station and/or using narrower stairways and escalators. Although the pedestrian LOS analysis indicates the sidewalks on the east side of Stockton Street between Post and Geary Streets operate without congestion, the presence of commercial and retail business and their seasonal impacts of attracting shoppers may impact pedestrian circulation on the sidewalks and would warrant such consideration of using narrower stairways and escalators. Trade-offs between pedestrian circulation impacts and traffic and parking impacts should be further evaluated during final design.

Other mitigation measures are the same as defined under Alternative 2.

Alternative 3 – Fourth/Stockton Alignment Option B (Modified LPA)

Operations and Cumulative Impacts

Under the Fourth/Stockton Alignment Option B (LPA), the proposed station entrance would be established at the existing bus bulb located on the northeast corner of Geary and Stockton Streets at the Union Square/Market Station where the effective walkway widths along the sidewalks (i.e., portion of sidewalk that can be effectively used for pedestrian movements) would be reduced to provide an access stairway. The station escalator on the northeast corner of Union Square would be located within the Union Square terraced section of the Plaza and would not affect the sidewalk. Sidewalks would not be narrowed at the other station locations.

At the proposed surface platform stop located on Fourth Street between Brannan and Bryant Streets for this alternative, the sidewalk widths would remain unaffected on this block. Since there would be no reduction in sidewalk width, it is not expected that additional pedestrian crowding would occur during peak periods, such as along Fourth Street's sidewalks before and after major events at the new Giants Ballpark. At the proposed subway portal located on Fourth Street between Bryant and Harrison Streets, the sidewalk widths would also remain unaffected.

Each of the proposed subway stations would be accessed via stairways, escalators, and elevators descending from the sidewalk area to the subway's mezzanine and platform levels. When provided within an existing sidewalk, subway access points reduce the effective sidewalk width available for pedestrians. The existing sidewalks near the proposed subway stations currently experience moderate to heavy pedestrian volumes and the subway stations would contribute additional pedestrian traffic. Emergency exits are located away from the main station portals and usually require a sidewalk bulb out to accommodate a steel hatch to access the exit. However, the establishment of these exits does not affect pedestrian access on the sidewalks. None of the three proposed subway stations would substantially reduce the effective sidewalk widths since the most of the stations' access points would be located away from the sidewalks.

Access to the proposed Moscone Station would be via one set of stairs, two sets of escalators, and two elevators, all of which are housed in a headhouse on the west side of Fourth Street between Clementina and Folsom Streets (refer to Figure 2-20). At this location, the existing public sidewalk is just over 16 feet wide. The sidewalk's effective width adjacent to the subway access points, would remain unchanged, thereby minimizing pedestrian overcrowding on the sidewalk. The resulting sidewalk width at the elevator would still conform to ADA guidelines and meet the 6-foot minimum clear space policy contained in San Francisco's *Downtown Streetscape Plan*.

Access to the proposed Union Square/Market Street Station would be provided by two sets of stairs, two sets of escalators, both of which are at the north end of the station and one elevator located at the

proposed Union Square entrance (refer to Figure 2-21). One of the station entrances would be located in the existing bus bulb at the northeast corner of Geary and Stockton Streets. In addition, a pedestrian connection between the station's mezzanine and the Union Square garage elevators would be established. The effective sidewalk widths on Stockton Street would remain unchanged since the station's main access point would be located within Union Square. Stockton Street's east and west side sidewalks are 15 feet wide. Currently, the sidewalk on the north side of Geary Street is 21 feet wide, including the bus bulb. With the station entrance, the effective sidewalk width on Geary Street would be 9.1 feet; however, pedestrian analysis for future conditions indicates that the sidewalk on the north side of Geary Street, east of Stockton Street where the station entrance is located, would operate at LOS A.

Due to the narrow widths of Stockton Street sidewalks near Washington Street (9.5 to 11 feet with a effective sidewalk width of 7.0 feet), it is proposed that the Chinatown Station's main access point be located within a station property on the southwest corner of Stockton and Washington Streets, thereby maintaining the existing effective sidewalk widths and minimizing pedestrian overcrowding on the sidewalk. There would be an extension of the west sidewalk to accommodate an emergency hatch on Stockton Street between Jackson and Washington Streets that would impact on-street parking, as previously discussed, but would not create pedestrian overcrowding. Since the curb lane on the west side of Stockton Street is not used as a travel lane, this would not reduce lane capacity (refer to Figure 2-22). The pedestrian level of service would be reduced from LOS A to LOS B as a result of the increased pedestrian volumes associated with station access in the vicinity of the Stockton/Washington Streets intersection.

Mitigation Measures

At the proposed Chinatown Station, efforts would be made to minimize pedestrian circulation impacts on Stockton Street and on streets adjacent to the station, where the placement of merchandise along storefronts on sidewalks in Chinatown is commonplace. Enforcement by DPW to keep sidewalks clear of such merchandise would be considered a priority to maintain adequate pedestrian circulation.

During final design, consideration would be given to ensure that stairways and escalators would not compete with sidewalk space for pedestrians, and to ensure enough space is reserved in the landing area at the escalators to provide for adequate pedestrian flow with the sidewalks at stations with headhouses. Consideration should also be given to widening Geary Street's sidewalk near the proposed Union Square/Market Street station and/or using narrower stairways and escalators. Although the pedestrian LOS analysis indicates the sidewalks on the north side of Geary Street east of Stockton Street operate without congestion, the presence of commercial and retail business and their seasonal impacts of

attracting shoppers may impact pedestrian circulation on the sidewalks and would warrant such consideration of using a narrower stairway. Trade-offs between pedestrian circulation impacts and traffic and parking impacts should be further evaluated during final design.

The remaining mitigation measures would be the same as described under Alternative 2.

3.2.6 BICYCLES

The project would have an effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

Although there are no designated bicycle routes on portions of the Project Corridor itself, the existing bicycle routes that run parallel and adjacent to the Project Corridor may be impacted due to the diversion of traffic to these parallel streets under the build alternatives.

As bicycle travel becomes more common in the Project Corridor, the potential for conflicts between motorists and bicyclists could increase; the reduction in the number of travel lanes could result in greater use of the outside travel lanes by motorized vehicles and more competition for the limited space between bicycles, autos, and trucks. Due to congestion, there would also be less opportunity for bicyclists to maneuver to avoid sudden obstacles, such as a door opening on a parked car. The impacts associated with each of the alternatives are discussed below.

Alternative 1 – No Project/TSM

Operations and Cumulative Impacts

Under the No Project/TSM Alternative, no significant bicycle impacts would occur.

Mitigation Measures

No significant bicycle impacts would occur under the No Project/TSM Alternative, therefore no mitigation is required.

Alternative 2 – Enhanced EIS/EIR Alignment

Operations and Cumulative Impacts

Provision of the light rail tracks and subway portal on Third Street between King and Bryant Streets would result in the loss of one traffic lane, eliminate most on-street parking, and retain 10-foot wide outside travel lanes. The traffic lane widths on Fourth Street between King and Bryant Streets would generally remain the same as they currently are. Diversion of traffic onto Second and Fifth Streets may

impact bicycle travel on these streets (Bicycle Routes #11 and #19, respectively). The San Francisco Bicycle Program's May 2005 Proposition K 5-Year Prioritization Program identifies proposed bicycle lanes in both directions on Second Street from Market Street to King Street and in both directions on Fifth Street from Market Street to Townsend Street. These proposed bicycle lanes would require the removal of travel lanes in some locations, and the feasibility of these travel lane removals could be impacted by the diversion of traffic onto Second and Fifth Streets. These proposed bicycle lane changes are undergoing separate environmental review.

No impacts to bicyclists are foreseen near the proposed Moscone, Market Street, Union Square and Chinatown stations since the finished stations would not affect existing traffic or bicycle lanes. Existing curbs would remain, except at the Chinatown station, where sidewalk extensions would be constructed. However, the sidewalk extensions would replace existing on-street parallel parking spaces and not affect bicycle circulation.

Mitigation Measures

Existing bicycle traffic on Fourth Street could be diverted to Fifth Street. If bicycle lanes are provided, as identified in the San Francisco Bicycle Program's May 2005 Proposition K 5-Year Prioritization Program, this would further facilitate bicycle travel. The same is true for existing bicycle traffic on Third Street diverting to Second Street.

Alternative 3 – Fourth/Stockton Alignment Option A (LPA)

Operation and Cumulative Impacts

Operation and cumulative impacts would be the same as those described under Alternative 2.

Mitigation Measures

Mitigation measures would be the same as described under Alternative 2.

Alternative 3 – Fourth/Stockton Alignment Option B (Modified LPA)

Operations and Cumulative Impacts

Operation and cumulative impacts would be the same as those described under Alternative 2.

Mitigation Measures

Mitigation measures would be the same as described under Alternative 2.

3.2.7 EMERGENCY VEHICLE ACCESS

This section describes the potential consequences to emergency vehicle access under each of the alternatives. Again, the fire stations potentially affected by the Project are: Fire Station #1 located at 676 Howard Street, just east of Third Street; Fire Station #8, located at 36 Bluxome Street, just west of Fourth Street; and Fire Station #2, located at 1340 Powell Street between Broadway and Pacific Avenue.

Alternative 1 – No Project/TSM

Operations and Cumulative Impacts

The No Project/TSM Alternative would not substantially affect emergency vehicle access. Emergency vehicle access for Fire Station #8 would remain the same, by exiting Bluxome Street to either Fourth or Fifth Streets and traveling “contra-flow” if exiting to Fourth Street.

Mitigation Measures

This alternative would not result in any significant impacts, therefore no mitigation is required.

Alternative 2 – Enhanced EIS/EIR Alignment

Operation and Cumulative Impacts

Compared to existing conditions, emergency vehicles from Fire Station #8 would encounter a new roadway configuration on Fourth Street, which would include a 12 foot, 6-inch trackway in the middle of the street. If any emergency response requires emergency vehicles from Fire Station #8 to travel contra-flow on Fourth Street, they would have to cross the entire trackway in order to reach the intersection of Fourth and Brannan Streets. For emergency vehicles responding from Fire Station #1, it is expected they would continue to operate under existing conditions.

Mitigation Measures

DPT will be upgrading traffic signals with emergency vehicle preemption equipment in order to minimize the emergency response time and to improve the signal operation at several intersections near fire stations along the Corridor. At Fire Station #8, the following locations will be upgraded with emergency preemption equipment: Third and Brannan Streets, Fourth and Brannan Street, Fourth and Townsend Streets, and Fifth and Brannan Streets. For Fire Station #1, the following locations will be upgraded with emergency preemption equipment: Third and Howard Streets, Third and Mission Streets, Fourth and Howard Streets, Fourth and Mission Streets, Geary Street and Grant Avenue, Geary and Powell Streets, and Geary and ~~Post-Stockton~~ Streets. These traffic signals could be programmed such that all approaches to these intersections are stopped except for the approaches which are receiving the emergency preemption call.

Alternative 3 – Fourth/Stockton Alignment Option A (LPA)

Operation and Cumulative Impacts

Compared to existing conditions, emergency vehicles from Fire Station #8 will be impacted with a new roadway configuration on Fourth Street, which will include a 24 foot, 8 inch double-track portal at the intersection of Fourth and Bluxome Streets. If any emergency response requires emergency vehicles from Fire Station #8 to travel in a northerly direction on Fourth Street, they must travel contra-flow on Fourth Street in order to reach the intersection of Fourth and Brannan Streets.

Mitigation Measures

Mitigation measures would be the same as outlined above under Alternative 2, except as noted here.

Some of the existing perpendicular parking spaces on Bluxome Street may need to be converted into parallel parking spaces to accommodate the turning radii of the emergency vehicles due to the limited roadway space between the portal and the west side of Fourth Street. For emergency vehicles responding from Fire Station #1, it is expected they will continue to operate under existing conditions.

Alternative 3 – Fourth/Stockton Alignment Option B (Modified LPA)

Operation and Cumulative Impacts

Compared to existing conditions, emergency vehicles from Fire Station No. 8 will encounter a new roadway configuration on Fourth Street, which would include a semi-exclusive 27 foot, 6 inch trackway in the middle of the street, with a raised 3 foot, 6 inch wide median. If any emergency response requires emergency vehicles from Fire Station #8 to travel in a northerly direction on Fourth Street, they must

cross the entire trackway and, in order to reach the intersection of Fourth and Brannan Streets, the raised track bed. For emergency vehicles responding from Fire Station #1, it is expected they will continue to operate under existing conditions.

Mitigation Measures

Mitigation measures would be the same as for Alternative 2.