

FIGURE 3.3-1

## Demographics

Nearly half of the population of the City and County of San Francisco is White (49.7 percent) and over three quarters of the local study area's population is White (76 percent) (U.S. Census 2000).<sup>1</sup>

The City and County of San Francisco has a substantially higher proportion of residents living in poverty (11.3 percent) than the local study area (5.9 percent).

**Housing.** The historical housing distribution for the City and County of San Francisco and the local study area is shown in **Table 3.3-3**. The housing stock in the City and County of San Francisco increased by approximately 5.5 percent between 1990 and 2000 and vacancy rates also decreased slightly. The number of housing units in the local study area also rose slightly (3.2 percent) and vacancy rates decreased over the same period.

**TABLE 3.3-3: HISTORICAL HOUSING DISTRIBUTION**

Area	Year	Housing Distribution			
		Housing Units	Occupied Housing	Vacant Housing	% Vacant
The City and County of San Francisco	1990	328,471	305,584	22,887	7.0%
	2000	346,527	329,700	16,827	4.9%
Local Study Area	1990	10,401	9,220	1,181	11.4%
	2000	10,739	9,847	892	8.3%
NOTE: The local study area consists of the Census Tracts 101,102,103 and 126. SOURCE: U.S. Census 2000 & 1990.					

Existing and projected households within the Study Area are shown in **Table 3.3-4**. Housing is projected to grow in the City and County of San Francisco by 19.7 percent between 2010 and 2035.

**TABLE 3.3-4: EXISTING AND PROJECTED HOUSEHOLDS**

Area	2010	2015	2025	2035	Projected Growth 2010-2035
The City and County of San Francisco	346,680	359,170	386,600	415,000	19.7%
SOURCE: ABAG 2009.					

<sup>1</sup> According to U.S. Census Bureau data, the Latino populations are not an official ethnic category due to reporting inaccuracies. Often, Latinos self-report themselves as being a part of another ethnic category, mostly white. Within the City of San Francisco 14.1 percent of residents reported themselves as Latino.

**Employment.** Historic labor force and unemployment rates for the local study area are illustrated in Table 3.3-5. The civilian labor force grew in the City and County of San Francisco between 1990 and 2000 and its civilian unemployment rate decreased by approximately three percent. There was also a decrease in the unemployment rates for the local area. In May 2010, the unemployment rate in San Francisco was 9.6 percent and was considerably lower than the statewide unemployment rate of 11.9 percent (California EDD 2010).

**TABLE 3.3-5: HISTORIC LABOR FORCE AND EMPLOYMENT**

Area	Year	Civilian Labor Force	Civilian Employment	Civilian Unemployment Rate
The City and County of San Francisco	1990	417,147	386,530	6.2%
	2000	448,432	427,823	3.0%
Local Study Area	1990	9,666	9,316	3.6%
	2000	10,859	10,572	2.6%
SOURCE: U.S. Census 2000 & 1990.				

The existing and projected jobs for the City and County of San Francisco are illustrated in Table 3.3-6. Jobs are projected to grow in the City and County of San Francisco by 41.9 percent from 2010 to 2035.

**TABLE 3.3-6: EXISTING AND PROJECTED JOBS**

Area	2010	2015	2025	2035	Projected Growth 2010-2035
The City and County of San Francisco	568,730	606,540	694,830	806,830	41.9%
SOURCE: ABAG 2009.					

The local study area encompasses part of Fisherman’s Wharf. Fisherman’s Wharf is a bustling tourist attraction filled with a variety of hotels, restaurants, shops, wholesalers, non-profit organizations, and private offices. The study area also encompasses part of San Francisco’s Marina District and two national parks: Fort Mason, Headquarters for the Golden Gate National Recreation Area and the San Francisco Maritime National Historical Park. There are over 337 businesses within the study area that cater to a variety of local and tourist interests and needs.

**Local Business.** Numerous businesses are located within Fisherman’s Wharf. In addition, the San Francisco Arts Commission licenses approximately 430 street artists to sell their goods at 370 sidewalk locations around the City. The selling area spaces are assigned daily by a lottery system to ensure that all vendors have an opportunity to occupy the best locations.

The selling area spaces along Justin Herman Plaza and along Beach Street near the Cable Car are the most popular amongst the street vendors due to the large amount of pedestrian tourist traffic in these areas. As a result these locations are typically occupied year round (weather permitting).

The San Francisco Arts Commission also offers street artist booth areas elsewhere within Fisherman's Wharf. The selling spaces further west on Beach (i.e. near the Larkin Street intersection) and to the east near Columbus Avenue and these locations are less popular than the Hyde Street corner spaces. Additional selling spaces are also located nearby along Hyde and Leavenworth Streets (both between Beach and Jefferson Streets) as well as a small number of spaces along Jefferson Street. Altogether there are approximately 110 selling spaces in the Fisherman's Wharf area of which approximately 61 percent are located along Beach Street. Of these, the majority (approximately 45 designated spaces) are located between Larkin and Hyde Streets (San Francisco Arts Commission 2010).

The San Francisco Arts Commission also offers street artist booth areas elsewhere in the City including along Market Street and around Union Square. These other locations are generally less desirable and consequently are less regularly occupied. Approximately 25 percent of the City's assigned selling spaces are generally unused due to their location. Nonetheless, within popular tourist areas such as Fisherman's Wharf nearly all the available spaces are typically occupied on weekends and during the high season (San Francisco Arts Commission 2010).

This page intentionally left blank

## 3.4 TRANSPORTATION AND CIRCULATION

### 3.4.1 Introduction

This chapter identifies the existing transportation conditions to provide a basis for assessing the transportation impacts associated with the proposed historic streetcar extension alternatives. The transportation and circulation study area is shown in **Figure 3.4-1**.

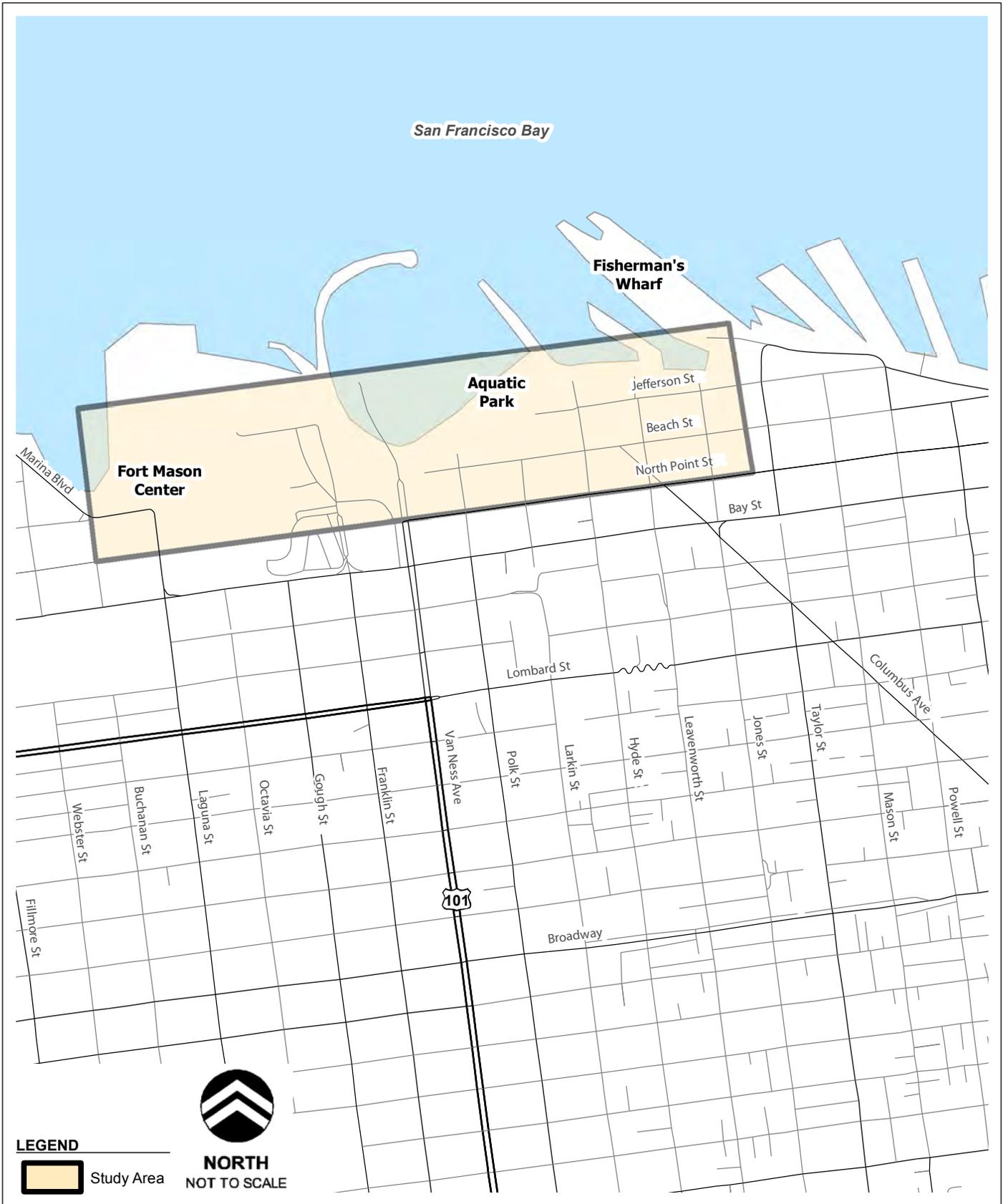
### 3.4.2 Environmental Setting

#### Transit Operations

Regional transit service between San Francisco and the North Bay is provided by Golden Gate Transit (bus and ferry lines); between San Francisco and the East Bay by Alameda-Contra Costa Transit (AC Transit), Bay Area Rapid Transit (BART), and ferry lines; and between San Francisco and the South Bay by San Mateo County Transit (SamTrans), BART, and Caltrain. Local transit service is provided by the San Francisco Municipal Railway (Muni), which operates a network of over 80 transit lines throughout San Francisco, including local, limited and express stop services. Transit services within the transportation and circulation study area and in the project vicinity are shown on **Figure 3.4-2**.

**Muni:** Within the transportation and circulation study area and in the project vicinity, Muni operates several bus routes, the Powell-Hyde and Powell-Mason cable cars, and the F-Line historic streetcar. The 19-Polk line operates on Polk Street, terminating at Ghirardelli Square with a counter-clockwise loop from Polk Street to Larkin Street, Beach Street and Polk Street. The 30-Stockton, 30X-Marina Express, 47-Van Ness and 49-Van Ness-Mission lines run through the transportation and circulation study area on Van Ness Avenue and/or North Point Street. The 28-19<sup>th</sup> Avenue line provides service to the Fort Mason area along Laguna Street in the eastbound/southbound direction. The F-Line historic streetcar travels westbound on Jefferson Street, and turns southbound at Jones Street where it terminates; the “return” service travels eastbound along Beach Street. The Powell-Hyde cable car operates north-south along Hyde Street, and has one turntable on the north-west corner of the Hyde and Beach Streets intersection. The Powell-Mason cable car operates on Mason Street, Columbus Avenue, and Taylor Street before terminating at Bay Street. In addition, the 22-Fillmore line stops at Fillmore and Beach Streets, a walk of about 0.3 mile to the Marina Boulevard / Laguna Street intersection.

**Golden Gate Transit (GGT):** The Golden Gate Bridge, Highway and Transportation District, provides bus service between the North Bay (Marin and Sonoma Counties) and San Francisco. In the transportation and circulation study area, Golden Gate Transit’s buses operate only during weekday peak hour in the peak-direction; the service times are generally 6:00 to 9:00 a.m. and 4:00 to 7:00 p.m. Only morning buses, which traverse Beach Street eastbound, will be affected directly by this Project; the afternoon commute buses travel westbound on North Point Street. There are 14 GGT bus lines transiting along Beach Street. The morning commute bus services enter the transportation and circulation study area northbound on Polk Street, turn eastbound onto Beach Street, and then continue onto The Embarcadero making a passenger stop at Hyde Street (far side).



Source: Wibur Smith Associates

**TRANSPORTATION AND CIRCULATION STUDY AREA**



Environmental Impact Statement  
Historic Streetcar Extension  
San Francisco, California

FIGURE 3.4-1



**BART:** BART operates heavy rail passenger service in the San Francisco Bay Area. BART currently operates five lines: Pittsburg/Bay Point to San Francisco International Airport, Fremont to Daly City, Richmond to Daly City/Millbrae, Fremont to Richmond, and Dublin/Pleasanton to Daly City/Millbrae. In San Francisco, BART operates underground along Market and Mission Streets. In general, BART operates at 15-minute headways per line on weekdays between 5:00 a.m. and 7:00 or 8:00 p.m. During weekday peak hours, the Pittsburg/Bay Point to San Francisco International Airport line operates frequently at 5- to 6-minute headways. During evening and weekend hours, trains generally operate at 20-minute headways per line. The BART station closest to the Project site is the Embarcadero Station, with a nearby connection to the Muni F-line to reach the Project area.

**AC Transit:** AC Transit is the primary bus operator for the East Bay, including Alameda and western Contra Costa Counties. AC Transit operates 32 routes between the East Bay and San Francisco, terminating at the Transbay Terminal located on Mission Street between Fremont and 1st Streets. Most Transbay service is peak-hour and peak-direction, traveling to San Francisco during the a.m. peak period (generally 6:00 to 9:00 a.m.) and from San Francisco during the p.m. peak period (generally 3:00 to 6:00 p.m.), with 15- to 30-minute headways per route. Four routes operate throughout the day on weekdays (with 30- to 45-minute headways per route), and two routes operate on weekends (with 30- to 60-minute headways per route). From the vicinity of the Transbay Terminal, the Muni F-line provides service to the Project area.

**SamTrans:** SamTrans is the primary public transit operator for San Mateo County. In addition, SamTrans provides service between San Mateo County and San Francisco. SamTrans operates 14 bus routes that serve San Francisco, including 12 routes into the downtown area (ending at the Transbay Terminal). Three of the downtown San Francisco routes provide service on a weekday daily and weekend basis (with 30-minute headways per route). From the vicinity of the Transbay Terminal, the Muni F-line provides service to the Project area.

**Ferries:** Ferry service is available between San Francisco, North Bay and East Bay communities, and tourist destinations from a variety of service providers. Ferry terminals are found at the Ferry Building (located on The Embarcadero at the foot of Market Street outside the study area) and at Fisherman’s Wharf (located within the transportation and circulation study area). Ferry service is oriented towards both commuter and recreational traffic, with the majority of ferry service at Fisherman’s Wharf oriented towards recreational and tourist patrons. Ferry service includes:

Ferry Operator	Destination
<i>Ferry Terminal</i>	
Golden Gate Transit	Sausalito, Larkspur
Alameda/Oakland Ferry	Alameda, Oakland
Alameda Harbor Bay Ferry	Harbor Bay Isle
Blue & Gold Fleet	Angel Island, Tiburon
Baylink	Vallejo
<i>Fishermans Wharf</i>	
Alameda/Oakland Ferry	Alameda, Oakland, Angel Island from Pier 41
Blue & Gold Fleet	Angel Island, Sausalito, Tiburon from Pier 41 Sightseeing tours from Pier 39

Ferry Operator	Destination
Baylink	Vallejo
Alcatraz Cruises, LLC aboard the Hornblower Fleet	Alcatraz Island tours from Pier 31½ / 33
Adventure Cat	Sightseeing tours from Piers 39
Red and White Fleet	Sightseeing tours from Piers 43½

**Caltrain:** Caltrain commuter rail service is managed by the Peninsula Corridor Joint Powers Board (PCJPB) and operated by Amtrak under contract to the PCJPB. Caltrain runs along the San Francisco Peninsula and Santa Clara Valley. The northern terminal of the rail line is in San Francisco, at 4th and King Streets, while the southern terminal is located in Gilroy. Trains operate out of San Francisco and San Jose on a half-hourly basis every weekday, with more frequent service provided during commute hours (5:30-8:30 a.m. and 5:00-8:00 p.m.). Service between San Jose and Gilroy is limited to three daily commute-hour round trips. During weekend and holidays, trains operate at hourly frequencies.

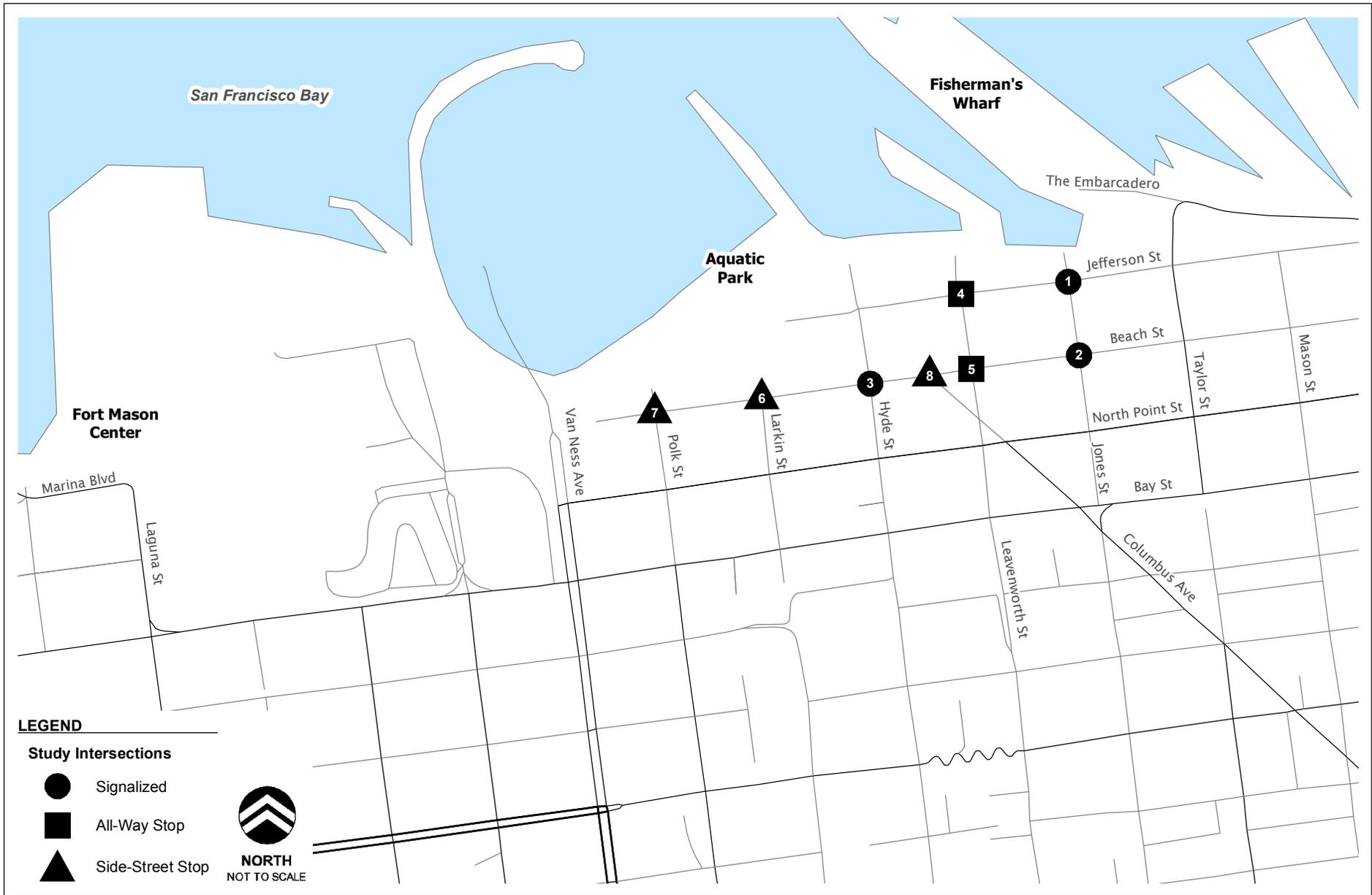
**General Traffic Conditions**

Existing intersection operating conditions were evaluated for the weekday p.m. peak hour (generally occurring between 4:00 and 6:00 p.m.) and weekend midday peak hour (generally between 12:00 Noon and 2:30 p.m.) at eight intersections in the transportation and circulation study area (see **Figure 3.4-3**). Turning movement volume counts were conducted on Wednesday, January 16, 2008 and Saturday, February 16, 2008 for the weekday and weekend scenario, respectively. See **Figure 3.4-4** for lane configurations and **Figure 3.4-5** for peak-hour traffic volumes (raw count data are presented in **Appendix B**).

Due to the tourist-oriented nature of the land uses in the Project area, it was judged that conducting traffic volume counts in January-February would not represent typical conditions during the tourist season, which typically occurs in the spring and summer months, and further analyses was undertaken to develop a set of turning movement volumes that represent typical summer traffic conditions in the Project area. To achieve representative summer volumes, pedestrian and vehicular counts were also conducted at The Embarcadero and Bay Street intersection; the results were compared to traffic counts performed at the same intersection in June 2007.

The analysis of the Bay Street intersection indicated that traffic in the area on a good weather day in late January or early February represents approximately 80 percent of the traffic volumes that can be expected on a typical summer day. As a result, a 1.22 for the weekday and 1.24 for the weekend seasonality factor was applied to all turning movement and pedestrian counts collected as part of this study, in order to establish base conditions for the peak tourist season.

The operations of intersections are commonly measured and described using a grading system called Level of Service (LOS), which qualitatively characterizes traffic conditions associated with varying levels of vehicle traffic, based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined, ranging from LOS A (indicating free-flow traffic conditions with little or no delay experienced by motorists) to LOS F (indicating congested conditions where traffic flows exceed design capacity and result in long delays). This LOS grading system applies to both signalized and



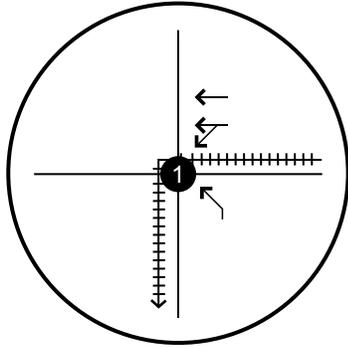
Source: Wibur Smith Associates

**PROJECT STUDY INTERSECTIONS**

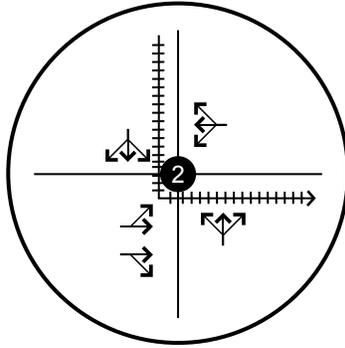
Environmental Impact Statement  
Historic Streetcar Extension  
San Francisco, California



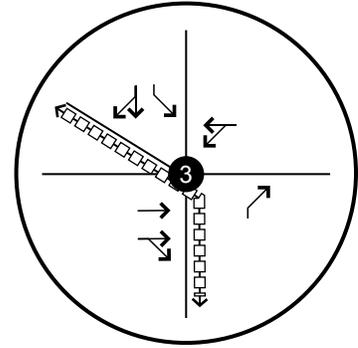
FIGURE 3.4-3



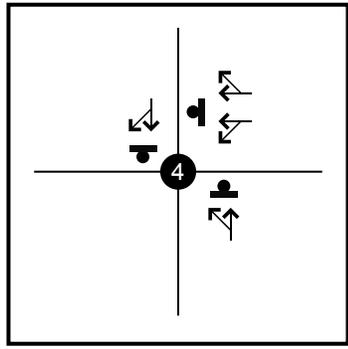
Jefferson St./  
Jones St.



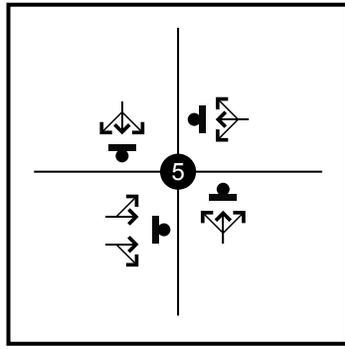
Beach St./  
Jones St.



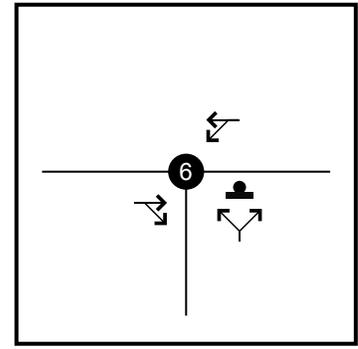
Beach St./  
Hyde St.



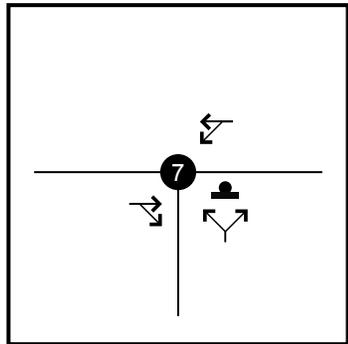
Jefferson St./  
Leavenworth St.



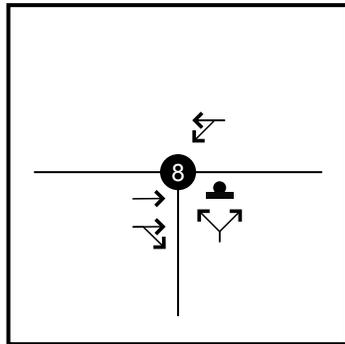
Beach St./  
Leavenworth St.



Beach St./  
Larkin St.



Beach St./  
Polk St.



Beach St./  
Columbus St.

**LEGEND**

- Unsignalized Intersection
- Signalized Intersection
- Cable Car Track
- Streetcar Track
- Stop Sign
- Traffic Direction



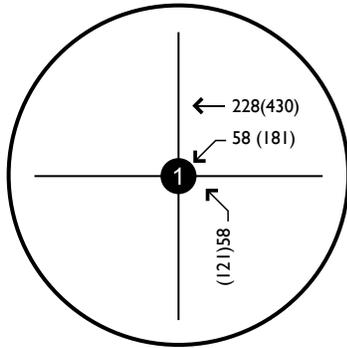
Source: Wibur Smith Associates

**EXISTING LANE CONFIGURATIONS**

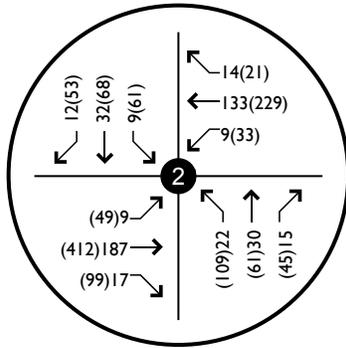
Environmental Impact Statement  
Historic Streetcar Extension  
San Francisco, California



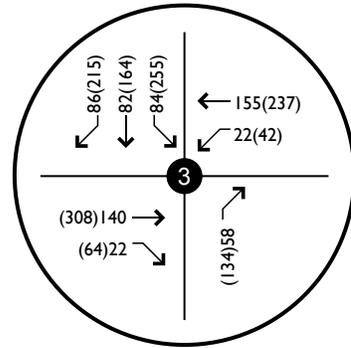
FIGURE 3.4-4



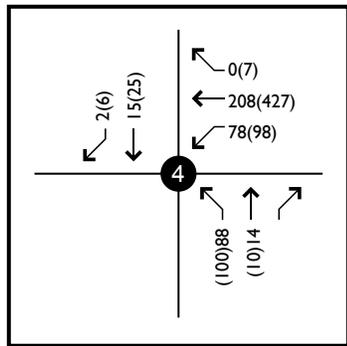
Jefferson St./ Jones St.



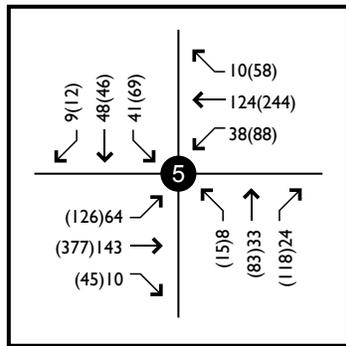
Beach St./ Jones St.



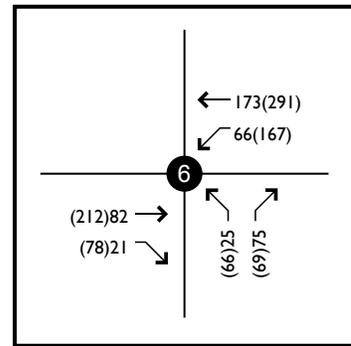
Beach St./ Hyde St.



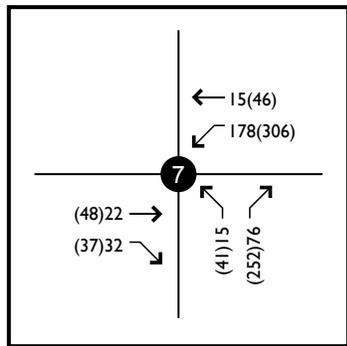
Jefferson St./ Leavenworth St.



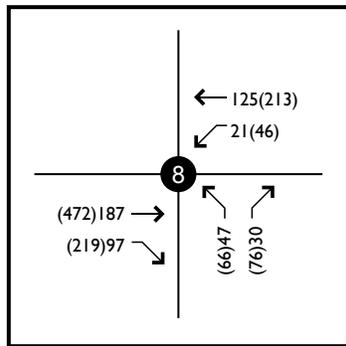
Beach St./ Leavenworth St.



Beach St./ Larkin St.



Beach St./ Polk St.



Beach St./ Columbus St.

**LEGEND**

- Unsignalized Intersection
- Signalized Intersection
- # Weekday PM Peak
- (#) Weekend MIDDAY Peak
- ← Traffic Direction



Source: Counts conducted by WSA on Wednesday 1/16/2008 and Saturday 2/16/2008

Source: Wibur Smith Associates

**EXISTING WEEKDAY PM PEAK & MIDDAY WEEKEND PEAK HOUR TRAFFIC VOLUMES**



Environmental Impact Statement  
Historic Streetcar Extension  
San Francisco, California

FIGURE 3.4-5

unsignalized intersections. The City of San Francisco has established LOS D as the generally acceptable service level standard. **Table 3.4-1** presents definitions of LOS and average delay for signalized and unsignalized intersections.

The Synchro traffic analysis software program was used to determine the LOS of the study intersections, using the *2000 Highway Capacity Manual* methodologies (Transportation Research Board 2000). **Tables 3.4-2** and **3.4-3** show the results of the analysis for the existing Weekday p.m. Peak and Weekend Midday Peak scenario, respectively. The full Synchro report is included in **Appendix B**.

With respect to weekday conditions, all of the study intersections operate at an acceptable LOS. The LOS ranges between A and B, with the exception of the intersection at Jefferson and Jones Streets, which operates at LOS C. Weekend conditions also have acceptable LOS, with no intersection operating worse than LOS C. However, the worsening of LOS, when compared to weekday conditions, is noticeable. All intersections experience a drop of one (intersection 2, 3, 4, 7, 8) or two (intersection 5 and 6) LOS levels, with the exception of the Jefferson and Jones Streets, which remains at LOS C.

### Parking

Parking resources in the transportation and circulation study area and project vicinity include both on-street and off-street facilities. **Table 3.4-4** shows existing on-street parking for the streets on which streetcars currently operate or might possibly operate in the future. In general, there are very few on-street parking spaces available during peak hours; the occupancy rate is approximately 90 to 100 percent for all streets within the transportation and circulation study area. **Table 3.4-5** provides a survey of the major off-street public parking facilities within or in proximity to the transportation and circulation study area. The table includes hotels that allow public parking.

In addition, there are parking spaces on Van Ness Avenue (within the San Francisco Maritime Historical Park) near, but not within, the Transition Segment of the Project. These parking spaces would not be affected by the Project.

The area of parking potentially affected by the Project extends west of Fort Mason Center to Fillmore Street, north of Bay Street. While this western area would not see streetcar service operating on its streets, it could experience parking impacts associated with the Project. It is not uncommon for commuters and others to park and walk that distance to board transit. However, as described below, much of the parking available in this area is restricted by meters or residential permits and so would not be suitable for long-term parking required by commuters.

The on-street parking is controlled by the city's residential permit parking program (Area M), which limits parking on weekdays to two hours for those without permits (available only to residents of Area M) between 8:00 am and 6:00 pm. At noontime on weekdays, the on-street spaces are about 70 percent used, and at noontime on weekends, the spaces are typically 95 to 100 percent occupied.<sup>1</sup>

---

<sup>1</sup> Wilbur Smith Associates – *Fort Mason Center Parking Monitoring Study*, July 2007.

**TABLE 3.4-1: DEFINITIONS FOR INTERSECTION LEVEL OF SERVICE**

Unsignalized Intersections		Level of Service Grade	Signalized Intersections	
Description	Average Total Vehicle Delay (Seconds)		Average Control Vehicle Delay (Seconds)	Description
No delay for stop-controlled approaches.	≤10.0	A	≤10.0	Free Flow or Insignificant Delays: Operations with very low delay, when signal progression is extremely favorable and most vehicles arrive during the green light phase. Most vehicles do not stop at all.
Operations with minor delay.	>10.0 and ≤15.0	B	>10.0 and ≤20.0	Stable Operation or Minimal Delays: Generally occurs with good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average delay. An occasional approach phase is fully utilized.
Operations with moderate delays.	>15.0 and ≤25.0	C	>20.0 and ≤35.0	Stable Operation or Acceptable Delays: Higher delays resulting from fair signal progression and/or longer cycle lengths. Drivers begin having to wait through more than one red light. Most drivers feel somewhat restricted.
Operations with increasingly unacceptable delays.	>25.0 and ≤35.0	D	>35.0 and ≤55.0	Approaching Unstable or Tolerable Delays: Influence of congestion becomes more noticeable. Longer delays result from unfavorable signal progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop. Drivers may have to wait through more than one red light. Queues may develop, but dissipate rapidly, without excessive delays.
Operations with high delays, and long queues.	>35.0 and ≤50.0	E	>55.0 and ≤80.0	Unstable Operation or Significant Delays: Considered to be the limit of acceptable delay. High delays indicate poor signal progression, long cycle lengths and high volume to capacity ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
Operations with extreme congestion, and with very high delays and long queues unacceptable to most drivers.	>50.0	F	>80.0	Forced Flow or Excessive Delays: Occurs with oversaturation when flows exceed the intersection capacity. Represents jammed conditions. Many cycle failures. Queues may block upstream intersections.

SOURCE: Transportation Research Board, Highway Capacity Manual, 2000.

**TABLE 3.4-2: EXISTING WEEKDAY P.M. PEAK-HOUR LEVEL OF SERVICE (LOS) AND AVERAGE DELAY**

Intersection	Traffic Control <sup>a</sup>	LOS	Delay <sup>b</sup>
1. Jefferson Street and Jones Street	Signal	C	20.2
2. Beach Street and Jones Street	Signal	B	13.1
3. Beach Street and Hyde Street	Signal	B	12.1
4. Jefferson Street and Leavenworth Street	AWSC	A	8.4
5. Beach Street and Leavenworth Street	AWSC	A	8.8
6. Beach Street and Larkin Street	SSSC <sup>c</sup>	A	8.7
7. Beach Street and Polk Street	SSSC <sup>c</sup>	A	8.3
8. Beach Street and Columbus Avenue	SSSC <sup>c</sup>	A	8.1
<p><sup>a</sup> AWSC is an unsignalized intersection with All-Way Stop-Control, and SSSC is an unsignalized intersection with Side-Street Stop-Control.</p> <p><sup>b</sup> The LOS and delay represent conditions for the overall intersection.</p> <p><sup>c</sup> This intersection was analyzed as AWSC because, from field observations, it was noted that most of the vehicles on the major (uncontrolled) street come to a full stop due to high pedestrian crossing volumes.</p> <p>SOURCE: Wilbur Smith Associates (based on traffic counts conducted on Wednesday, January 16, 2008)</p>			

**TABLE 3.4-3: EXISTING WEEKEND MIDDAY PEAK-HOUR LEVEL OF SERVICE (LOS) AND AVERAGE DELAY**

Intersection	Traffic Control <sup>a</sup>	LOS	Delay <sup>b</sup>
1. Jefferson Street and Jones Street	Signal	C	23.0
2. Beach Street and Jones Street	Signal	C	25.1
3. Beach Street and Hyde Street	Signal	C	20.1
4. Jefferson Street and Leavenworth Street	AWSC	B	10.3
5. Beach Street and Leavenworth Street	AWSC	C	19.3
6. Beach Street and Larkin Street	SSSC <sup>c</sup>	C	16.4
7. Beach Street and Polk Street	SSSC <sup>c</sup>	B	12.0
8. Beach Street and Columbus Avenue	SSSC <sup>c</sup>	B	12.1
<p><sup>a</sup> AWSC is an unsignalized intersection with All-Way Stop-Control, and SSSC is an unsignalized intersection with Side-Street Stop-Control.</p> <p><sup>b</sup> The LOS and delay represent conditions for the overall intersection.</p> <p><sup>c</sup> This intersection was analyzed as AWSC because, from field observations, it was noted that most of the vehicles on the major (uncontrolled) street come to a full stop due to high pedestrian crossing volumes.</p> <p>SOURCE: Wilbur Smith Associates (based on traffic counts conducted on Saturday, February 16, 2008)</p>			

**TABLE 3.4-4: ON-STREET PARKING SURVEY<sup>a</sup>**

Roadway	From	To	Meter	Yellow	White	Blue	Transit	Other
Jefferson	Jones	Leavenworth	9		2			
	Leavenworth	Jones	14					
Jones	Jefferson	Beach					F-Line	
	Beach	Jefferson						9
Leavenworth	Jefferson	Beach	3	8				
	Beach	Jefferson	2	3	4	1		
Beach	Jones	Leavenworth	3	6	4	1		
	Leavenworth	Hyde	7		3	1		
	Hyde	Polk	25		4	3	Muni	23
	Polk	End Street						24
	End Street	Polk						10
	Polk	Larkin	12	1	4			
	Larkin	Hyde	16	2				
	Hyde	Columbus		4	3		Golden Gate	
	Columbus	Leavenworth			2			
	Leavenworth	Jones		14				

<sup>a</sup> Meter = normal meter parking; Yellow = short-term parking for commercial vehicle loading/unloading; White = short-term parking for passenger loading/unloading; Blue = parking for handicapped drivers; Transit = bus, cable car or streetcar stop present; and Other = either free unregulated space or special parking schedule.

SOURCE: Wilbur Smith Associates, December 2007 (WSA 2007c)

**TABLE 3.4-5: OFF-STREET PARKING SURVEY**

Parking Garage / Lot	Supply
Pier 45 Shed A	200
Pier 43 ½	102
Fisherman's Wharf Triangle Lot	273
Mason Street / Jefferson Street Lot	40
Anchorage Garage	587
Wharf Parking Inc.	150
Taylor Street / Beach Street <i>Park and Lock</i>	40
The Wharf Garage	250
Radisson	235
Pier 39 Parking Garage	978

**TABLE 3.4-5: OFF-STREET PARKING SURVEY (CONTINUED)**

Parking Garage / Lot	Supply
Ghirardelli Square	275
655 Beach Street	119
Holiday Inn Fisherman’s Wharf	210
Nunzio’s Public Parking	24
Longshoreman’s Union Hall	50
Sheraton Fisherman’s Wharf	230
Academy of Art University	140
SOURCE: San Francisco Municipal Transportation Agency, <i>Existing Transportation Conditions Report for the Fisherman’s Wharf Area Plan</i> , August 2003	

With respect to off-street parking, the Fort Mason Center lot is the only one directly affected by the Project; currently there are 446 spaces, of which 20 spaces are for disabled parking, 4 spaces are reserved for National Park Service permit holders, and the rest require a parking fee (except for the first 30 minutes, when parking is free). The occupancy rate of the Fort Mason Center parking facility is generally low during weekday (peaking at about 33 percent during midday) and mid-high during weekends (highest peak is about 68 percent during midday and evening). This lot is also used by large semi-trucks for staging and loading purposes. One observation found ten large trucks staging on the parking lot. Table 3.4-6 provides more detailed off-street parking occupancy data.

**TABLE 3.4-6: FORT MASON CENTER PARKING SURVEY AND OCCUPANCY**

Day of Week	Supply	Morning Occupancy (Percent)	Midday Occupancy (Percent)	Evening Occupancy (Percent)
Weekday	446	124 (28%)	145 (33%)	123 (28%)
Weekend	446	152 (34%)	306 (68%)	300 (67%)
SOURCE: Wilbur Smith Associates, <i>Fort Mason Center Parking Monitoring Study</i> , July 2007 (WSA 2007a)				

In addition to the Fort Mason Center lot, off-street parking is available in lots immediately surrounding the Fort Mason Center related to the marina (the East Harbor [also known as Gashouse Cove], Marina Green and Upper Fort Mason) and the Safeway store. Occupancy of the marina lots (about 800 spaces) is greatest on weekdays during the midday (57 percent), with a weekend midday peak of 74 percent during special events at the Fort Mason Center. The Safeway parking lot (about 170 spaces - typically about two-thirds occupied at noon on weekdays and weekends, and full during evening hours) is a private parking facility, and is described here only because of the potential for unauthorized use by visitors to Fort Mason Center.

## Bicyclists and Pedestrians

The Project site is located in the proximity of several of San Francisco's tourist attractions, including Fort Mason Center, Ghirardelli Square, Aquatic Park, the Anchorage shopping center and Fisherman's Wharf. Pedestrian activity levels are generally light in the morning, and increase following the opening of tourist attractions between 9:00 and 10:00 a.m. The highest volume of pedestrians are along Jefferson Street; crossing locations at Leavenworth and Jones Streets experience an average of 1,500 or more pedestrians per hour during weekdays and up to 5,000 pedestrians during the weekend peak hours (Wilbur Smith Associates 2008 – See Appendix B). Sidewalks are in good condition and range from 10 to 16 feet wide; however, there are several locations where the sidewalk capacity is reduced by street vendors and artists' stands (e.g., on the north side of Beach Street between Larkin and Hyde Streets), outdoor restaurant seating (e.g., along the north side of Jefferson Street, between Leavenworth and Jones Streets), utility poles, and street furniture. This is especially true on Jefferson Street where pedestrian volumes are high. Crosswalks are striped for each roadway of the study intersections.

The Bay Trail (under the jurisdiction of the Association of Bay Area Governments) traverses the Project site with an alignment that connects with The Embarcadero on the east side to the Marina Green on the west side via Jefferson Street, the Aquatic Park promenade north of the Maritime Museum, a connecting trail in Upper Fort Mason, the eastern sidewalk along Laguna Street (crossing the Main Gate to Fort Mason Center), and continuing along the northern edge of Marina Boulevard. The Bay Trail is intended to complement, rather than supplant, local regulations and guidelines.

The following four designated bikeways, as well as a segment of the San Francisco Bay Trail are in the project area (see **Figure 3.4-6**):

- Bicycle Route 2 connects The Embarcadero to the Golden Gate Bridge through the transportation and circulation study area along North Point Street to Van Ness Avenue. Route 2 continues north on Van Ness Avenue where it follows the pathway along the north edge of Fort Mason. From Fort Mason, Route 2 continues on Marina Boulevard west to the Presidio. Portions of Route 2 through Fort Mason and along the Marina Green are Class I off-road shared pedestrian/bicycle pathways, while the on-street segments on North Point Street, Van Ness Avenue, and Marina Boulevard are Class III bicycle routes (wherein bicyclists and autos share the pavement width).
- Bicycle Route 4 connects Polk Street to the Golden Gate Bridge. In the vicinity of the transportation and circulation study area, Route 4 travels along Francisco Street from Polk Street to Laguna Street and then along Bay Street to Fillmore Street, continuing to the Presidio and the Golden Gate Bridge. The segments on Bay Street west of Laguna Street and Francisco Street in the eastbound direction have Class II bicycle lanes (wherein a striped lane is provided for bicyclists, separate from autos). Other segments are Class III bicycle routes.
- Bicycle Route 11 connects Fisherman's Wharf to AT&T Park (the Giants baseball ball park at 3rd and King Streets). In the vicinity of the transportation and circulation study area, Route 11 is located on Columbus Avenue, terminating at North Point Street with Class III bicycle routes.
- Bicycle Route 25 connects Aquatic Park to Visitation Valley. Within the transportation and circulation study area, Route 25 is located on Polk Street, terminating at Beach Street with a Class II bicycle lane in the southbound direction and a Class III bicycle route in the



Source: Wibur Smith Associates

**BICYCLE FACILITIES**

Environmental Impact Statement  
Historic Streetcar Extension  
San Francisco, California



FIGURE 3.4-6

northbound direction between Beach and Lombard Streets. Polk Street south of Lombard Street has Class II bicycle lanes in both directions.

- A segment of the San Francisco Bay Trail runs along the waterfront from the Embarcadero on Jefferson Street to connect with Class I off-road shared pedestrian/bicycle path on the above-described Route 2 through the Golden Gate National Recreation Area, Aquatic Park and the Fort Mason Center. Past Fort Mason Center, the Bay Trail continues on the north side of Marina Boulevard to Fort Point and the Golden Gate Bridge.

The transportation and circulation study area has very active bicycle use by locals and tourists. In fact, there are five bicycle shops in the transportation and circulation study area and two in proximity that only rent bicycles (i.e., no sell/repair). While there are some designated bikeways in the transportation and circulation study area, bicyclists can be found on all streets particularly on Beach and Jefferson Streets.

### 3.4.3 Regulations and Policies

The following federal, state and local regulations govern the review and analysis of transportation in the study area.

#### Federal Guidelines

**National Environmental Policy Act of 1969 (NEPA).** Requires all federal agencies to assess the environmental impacts of proposed projects and disclose the impacts of the project to the public in order promote efforts that will prevent or eliminate damage to the environment. The President's Council on Environmental Quality (CEQ) was established to oversee NEPA for all federal agencies. The National Park Service (NPS) is the lead NEPA agency for this project.

**United States Department of Transportation (USDOT) Act of 1966 - Section 4(f).** Section 4(f) provides protection to certain publicly used lands and historic sites. Under Section 4(f), the USDOT shall not approve a program or project that requires the use of any publicly-owned public park, recreation area or wildlife or waterfowl refuge, or a site of any land from an historic site or national, state, or local significant unless:

- There is no feasible and prudent alternative to the use, and
- All possible planning to minimize harm resulting from such use is included.

**The Golden Gate National Recreational Area General Management Plan (GMP) (1980).** Golden Gate National Recreation Area (GGNRA) was established in 1972. In 1977 the GGNRA Travel Study, mandated by Congress, recommended restoration of the historic rail link between the Hyde Street Pier, Aquatic Park, and lower Fort Mason to improve access to the national park. The study's Joint Control Board included representatives from the San Francisco Metropolitan Transportation Commission, the City and County of San Francisco, the Federal Highway Administration, the California Department of Transportation (Caltrans), and others. The study identified restoration of the historic rail service as an important method to reduce congestion and visitor use of private

passenger vehicles to access the park. The restoration of rail service along the city's northern waterfront using the historic rail corridor was also a recommendation of the 1980 GMP for GGNRA.

The GGNRA GMP, which was implemented in 1980, is the master plan document for the entire GGNRA. The document describes the existing character and setting of the GGNRA and sets forth goals for future development within the park. The document is made up of two parts: The GMP, which guides development policy within the park; and The Environmental Analysis, which describes the environmental impacts The GMP may incur if implemented. Within the Transportation section of The GMP, under "Immediate Considerations" it states: "*Better scheduling and direct routing of weekend public transit to the park (in many cases simply extending an existing bus route three to five blocks) will greatly improve the probability of greater reliance on transit for park access.*" The text goes on to recommend the following transportation improvement to achieve this goal: "*Improved service connecting southeast San Francisco neighborhoods and San Francisco parklands.*" Further, The GMP suggests "*A shuttle connecting parklands along the northern San Francisco waterfront utilizing the beltline railroad right-of-way. This shuttle, which may utilize historic San Francisco trolley cars, will travel along the existing railroad tracks from Aquatic Park to Crissy Field and may be extended as far as Fort Point. . .*" The current GGNRA GMP is in the process of being updated and is expected to be implemented in August 2012.<sup>2</sup>

**The San Francisco Maritime National Historical Park (SF Maritime NHP) General Management Plan (1997).** The SF Maritime NHP GMP which was completed in 1997, is the master plan document for SF Maritime NHP. The document describes the existing character and setting of SF Maritime NHP and sets forth goals for future development within the park. The document is made up of two parts: The Plan; which guides development policy within the park, and The Environmental Analysis; which describes the environmental impacts The GMP may incur if implemented.

Within the Visitor Use and Development section of the GMP, under "Access and Circulation" it states: "The park and Fisherman's Wharf area in general are highly accessible by various forms of mass transit (MUNI transit lines/cable car and F line). *The park will work cooperatively with the City of San Francisco and local business interests to encourage local residents and visitors to use their alternative forms of transportation.*" The text goes on to state "*To improve access the park will support the Golden Gate National Recreation Area General Management Plan and the Presidio General Management Plan Amendment. These include opening the railroad tunnel under Fort Mason as an access to the maritime park from the Marina District and Presidio and extending the F-line rail system from Fisherman's Wharf west through Aquatic Park to the Presidio and establishing a system of water shuttles accessing park sites in San Francisco Bay.*"

## 2006 National Park Service Management Policies

**9.1.1.2 Integration of Facilities into Park Environment.** The integration of facilities into the park environment will involve: assessment of the transportation and mobility needs of park visitors and concessioner and NPS employees, and of access to the park from gateway communities.

---

<sup>2</sup> Plan Process, Step 6, <http://parkplanning.nps.gov/PlanProcess.cfm?parkId=&projectId=15075>, Accessed July 2, 2007.

*9.2 Transportation Systems and Alternative Transportation.* The location, type, and design of transportation systems and their components (e.g., roads, bridges, trails, and parking areas), and the use of alternative transportation systems, all strongly influence the quality of the visitor experience. These systems also affect, to a great degree, how and where park resources will be impacted. For these reasons, management decisions regarding transportation facilities require a full, interdisciplinary consideration of alternatives and a full understanding of their consequences. Traditional practices of building wider roads and larger parking areas to accommodate more motor vehicles are not necessarily the answer. The Service must find transportation solutions that will preserve the natural and cultural resources in its care while providing a high-quality visitor experience.

**Federal Transit Administration New Starts Program.** The Federal Transit Administration (FTA) provides capital funding for projects like the Fort Mason Center Historic Streetcar Extension under their New Starts Program. Projects with total costs under \$250 million, and requesting less than \$75 million of federal funding, are eligible for a less rigorous application process, “Small Starts”. FTA funding is not envisioned to fund the extension.

### State and Regional Guidelines

**San Francisco Bay Plan (2003).** The San Francisco Bay Conservation and Development Commission (BCDC) is a state agency with the authority to issue or deny permit applications for placing fill, extracting minerals, or changing the use of any land, water, or structure within the San Francisco Bay. The plan area’s jurisdiction is defined as the San Francisco Bay, a band of land 100 feet (30 meters) from the shoreline of the San Francisco Bay, saltponds, managed wetlands and certain specified waterways. The San Francisco Bay Plan, adopted in 1968 by BCDC and last amended in 2006, includes policies to guide future uses of the Bay and shoreline and includes a set of maps which show where the policies should apply to the present Bay and shoreline.<sup>3</sup> The project alternative which proposes a portion of the railway to travel along the Aquatic Park promenade is within the jurisdiction of the San Francisco Bay Plan. According to the BCDC, *nearly all work, including grading, on land within 100 feet of the Bay shoreline needs permit approval.* With regards to federal projects, the Coastal Zone Management Act allows the Commission to review federal projects and projects that require federal approval or federal funding; a process known as “federal consistency”. However, the Commission cannot require federal agencies to submit permit applications. The Commission can impose conditions on its federal consistency decisions. Nevertheless, the federal agencies and applicants for federal approvals must provide the project’s details and data to assure that the Commission has the information it needs to evaluate the project (BCDC 2007). The following policies from the Bay Plan are applicable to the project study area.

- **Policy 1** – Because of the continuing vulnerability of the Bay to filling for transportation projects, the Commission should continue to take an active role in Bay Area regional transportation and related land use planning affecting the Bay, particularly to encourage alternative methods of transportation and land use planning efforts that support transit and that do not require fill. The Metropolitan Transportation Commission, the California Department of Transportation, the California Transportation Commission, the Federal Highway Administration, county congestion management agencies and other public and

---

<sup>3</sup> San Francisco Bay Plan, Adopted 2003.

private transportation authorities should avoid planning or funding roads that would require fill in the Bay and certain waterways.

- **Policy 4** – Transportation projects on the Bay shoreline and bridges over the Bay or certain waterways should include pedestrian and bicycle paths that will either be a part of the Bay Trail or connect the Bay Trail with other regional and community trails. Transportation projects should be designed to maintain and enhance visual and physical access to the Bay and along the Bay shoreline.

**California Public Utility Commission (CPUC).** The CPUC regulates rail operations on streets and highways in California. While the CPUC does not have jurisdiction over projects on National Park Service property, it does have jurisdiction over the sections of the extension that are not on federal property. As such it will need to approve the street traffic integration plan including traffic control devices, vehicles, and operating practices and, therefore, is a key partner for this project. The Manual of Uniform Traffic Control Devices allows for STOP sign control crossings for low volume traffic crossings that like proposed by the Fort Mason Center Historic Streetcar Extension project at Van Ness Avenue. While the regulations are silent regarding rail integration into parking lots (Fort Mason Center), the CPUC mostly likely will want to weigh in on the design and operational safety.

**Port of San Francisco.** The Port is responsible for some of the on-street parking in the study area. Removal of their on-street parking would require Port approvals.

### Local Guidelines

This section describes various elements of the City and County of San Francisco's General Plan, as well as Specific Area Plans that contain adopted transportation policies applicable to the project study area. The General Plan elements reviewed include the Transportation Element. The Area Plans reviewed include Northeastern Waterfront, Van Ness Avenue, the Waterfront Land Use Plan by the Port of San Francisco, San Francisco Waterfront Special Area Plan, and the San Francisco Bicycle Plan.

**City and County of San Francisco General Plan (2007) – Transportation Element.** The Transportation Element of the General Plan of the City and County of San Francisco was first adopted in 1972 and was later amended by the Board of Supervisors in 2007. The Transportation Element is composed of nine sections: general; regional transportation, congestion management; vehicle circulation; transit; pedestrians; bicycles; citywide parking; and goods movement. Policy 1.3 is to *“give priority to public transit and other alternatives to the private automobile as the means of meeting San Francisco’s transportation needs, particularly for commuters.”* Policy 1.6 is for mass transit to be given priority for trips where travel demands exceeds the capacity of the area to absorb more vehicular traffic without substantial environmental damage or where further capacity for automobiles movement or storage is very costly. Policy 1.6 also is to give priority to mass transit for trips to major recreational areas and to sports, cultural and other heavily attended events. Policy 4.4 is to integrate future rail extensions to, from and within the city so that they are compatible with and immediately accessible to existing BART, Caltrain or MUNI rail lines. Finally, Policy 21.3 is to *“make future rail transit extensions in the city compatible with existing BART, Caltrain or MUNI rail lines. In order to ensure potential linkage, interchange of vehicles and cost savings, new rail transit lines should be of the same basic type as either the BART, Caltrain or MUNI systems, depending on the potential link.”*

**Northeastern Waterfront Area Plan (1998).** The Northeastern Waterfront Area Plan is an area plan of the General Plan of the City and County of San Francisco. It was first adopted in 1977 and later amended by the Board of Supervisors 1998. The Northeastern Waterfront Area Plan recommends “*objectives and policies designed to contribute to the waterfront’s environmental quality, enhance the economic vitality of the Port and the City, preserve the unique maritime character, and provide for the maximum feasible visual and physical access to and along the Bay.*”<sup>4</sup> The Plan recommends “*general objectives and policies for Land Use, Transportation, and Urban Design and recommends specific objectives and policies which apply to four geographic subareas as well as the Embarcadero Corridor which links them: Fisherman’s Wharf Subarea (which extends from the Municipal Pier at Van Ness Avenue through Pier 39); the Base of Telegraph Hill Subarea (Pier 35 through Pier 7); the Ferry Building Subarea (Pier 5 through Rincon Park); and the South Beach Subarea (Pier 22 through Pier 46B).*”<sup>5</sup> The following policies are applicable to the project study area.

- **Policy 7.3** – Connect the recreation and open space facilities of the Northeastern Waterfront with those of the Golden Gate National Recreation Area.<sup>6</sup>
- **Policy 9.5** – Improve transit service to, and along, the Northeastern Waterfront. Provide a connection between the F-line and the MUNI Metro Extension to allow for continuous transit rail service in an exclusive right-of-way along The Embarcadero between Fisherman’s Wharf and China Basin, which also connects with or provides easy transfers to numerous other transit lines.
- **Policy 31.3** – Provide rail transit service in an exclusive transit way from Fort Mason to the Southern Pacific Depot. An extension of Market Street surface rail, the F-Line should operate north of Market Street; the vehicles should be historic in character in order to provide a special waterfront transit identity. South of Market Street the transit service should be a surface extension of the MUNI Metro. Allow for continuous rail transit service along the length of the waterfront.

**San Francisco Waterfront Special Area Plan (2000).** The San Francisco Waterfront Special Area Plan, developed by the BCDC, is an amendment to the Bay Plan. The Special Area Plan does not supersede the San Francisco Bay Plan; rather it reconciles the differences between the Bay Plan and the Port’s Waterfront Land Use Plan. The plan contains no specific policies or recommendations about transportation services in general or the project.

**San Francisco Bicycle Plan (2009).** The San Francisco Bicycle Plan, adopted in 1997 and updated in 2009, presents a guideline for the City to provide the safe environment and infrastructure needed to promote bicycling as a transportation mode. The Bicycle Plan is a comprehensive review of policies, procedures, practices and physical infrastructure of the city with respect to bicycling.

***Bicycle Routes, Paths and Lanes.*** The existing bicycle network in San Francisco is composed of Class I, II, and III bikeways.<sup>7</sup>

<sup>4</sup> San Francisco Northeastern Waterfront Plan, Adopted 1977, amended 1998 by the Board of Supervisors.

<sup>5</sup> The study area for the Northeastern Waterfront Area Plan is shown on Map 1 on Page II.9.6 of that document.

<sup>6</sup> For the purposes of the Northeastern Waterfront Area Plan, Policy 7.3 actually refers to connecting the facilities of the Northeastern Waterfront with those of the San Francisco Maritime National Historical Park (Aquatic Park), not the GGNRA.

<sup>7</sup> State of California, *California Streets and Highways Code*, Section 890.4.

- Class I (Multi-Use Path) – Completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flow by motorists minimized.
- Class II (Bike Lane) – Provides a striped lane for one-way bicycle travel on a street or highway.
- Class III (Bike Route) – Provides for shared use with pedestrians or motor vehicle traffic.

As described in Chapter 3.3. Socioeconomics, the transportation and circulation study area currently is served by Bicycle Routes 2 and 25, with Routes 4 and 11 in the vicinity of the study area.

An update to the 1997 Bicycle Plan was initiated by the Bicycle Program in 2002. The resulting document was approved by the Board of Supervisors in 2005. In November of 2006, the Superior Court imposed an injunction on implementation of the Bicycle Plan until the City completes a full environmental review on the Plan. This injunction prohibits the City from making any physical streetscape changes recommended in the Bicycle Plan such as parking removal and lane re-allocation to accommodate bicycle lanes, installing shared-lane "sharrows" and/or U-rack bike parking racks. The draft environmental impact report, which will only apply to City of San Francisco streets and roadways, was certified in 2009.

As part of the updated Bicycle Plan, North Point Street is recommended for bicycle lanes from The Embarcadero to Van Ness Avenue as a Near-Term Improvement. To implement this bicycle project, one westbound travel lane on North Point Street between Stockton Street and Van Ness Avenue, and one eastbound travel lane between Stockton Street and The Embarcadero would be removed.

**San Francisco Municipal Transportation Agency (SFMTA).** SFMTA, through its San Francisco Municipal Railway (MUNI), is responsible for operating the historic streetcars, as well as other public transit services. SFMTA, through its Department of Parking & Traffic, is also responsible for traffic engineering functions within the City and County of San Francisco including recommendations to the SFMTA Board and the Board of Supervisors for traffic and parking regulations and enforcement.

**San Francisco Municipal Transportation Agency (SFMTA) and City Controller's Office – Transit Effectiveness Project.** The Transit Effectiveness Project (TEP) is a collaboration between the SFMTA and the City Controller's Office to review San Francisco's public transit system. The TEP has developed a set of staff recommendations that set forth a comprehensive strategy for growing with and meeting transit market demand in a dynamic city committed to a Transit First policy and sustainability for future generations. TEP recommendations are designed to make MUNI service more reliable, quicker and more frequent. On October 21, 2008, the SFMTA Board of Directors voted unanimously to endorse the TEP recommendations for the purpose of initiating any required environmental assessment.

Muni is experiencing budget problems and in order to address them, they are delaying implementation of TEP recommendations and made other changes to their services in December 2009 and May 2010. The recent service changes notwithstanding, the TEP recommendations include:

- Initiation of service on the E-Line using historic streetcars connecting Fisherman's Wharf (Jones Street terminal) and the northern waterfront to Caltrain Depot via The Embarcadero and King Street.

- Shifting of service on the F-Market [F-Line] from the a.m. peak to midday and p.m. peak to reduce crowding on the busiest times of day.
- 10-Townsend would be discontinued. Segments south of Broadway would be replaced by the modified 12-line and 47-line. Service on North Point would be provided by proposed 11-Downtown Connector. Service on the Embarcadero would be provided by the E- and F-lines.
- 11-Downtown Connector would provide a new bus line operating on Polk, North Point, Powell, Sansome, 2nd, Folsom, and 11th Streets, and Columbus Avenue. This line would provide North Beach with a connection to the Financial District / Montgomery Station.
- 19-Polk would be retained, but its northern terminus relocated to North Point Street.
- 20-Columbus would be discontinued and replaced by the new 11-Downtown Connector which would provide direct, all-day service between North Beach and the Financial District / Montgomery Station.
- 28-19<sup>th</sup> Avenue would terminate at the Golden Gate Bridge. Service to Marina would be provided by 28L; service to Fort Mason would be provided by 43-line. Late night and OWL coverage of Marina would be provided by 28 when 28L is not running.
- 28L-19th Avenue Limited would have all-day rapid, very limited-stop service—increasing access to SFSU and City College from Marina, Richmond, Sunset, and Excelsior. Service would be extended to Van Ness / North Point on Lombard St. and to Mission/Geneva via I-280.
- 43-Masonic would be extended from Chestnut/Fillmore to Fort Mason (Marina Blvd/Laguna), replacing the existing 28-line terminal. Service in the Presidio would be modified to connect to the Presidio Transit Center.
- 47-Van Ness would terminate at Van Ness and North Point. Service on North Point would be provided by the new 11-line.
- The TEP Enhanced Plan calls for the extension of the Historic Streetcar service to Fort Mason.

**Fisherman’s Wharf Public Realm Plan (2010).** The Fisherman’s Wharf Public Realm Plan is an inter-agency partnership, led by the San Francisco Planning Department. The Draft Plan, released in June 2010, presents new streetscape designs for the Wharf’s streets, design guidelines for new development, a revamped parking and circulation plan, and proposals for new and refurbished public open spaces. Design concepts under consideration for the plan would designate Jefferson Street a Pedestrian Priority Street, and would reduce vehicle traffic volumes on Jefferson Street through wayfinding signage, and sidewalk and pavement design features. In addition, the plan contains parking management policies to provide more efficient use of the existing parking garages through use of dynamic signage with real-time parking information to direct drivers to those garages with the greatest number of available parking spaces.

## 3.5 AIR QUALITY

### 3.5.1 Introduction

This section evaluates the existing regional and local air quality conditions from both stationary and mobile sources of air emissions. Development of this section was based on a review of existing documentation of air quality conditions in the region, air quality regulations from the United States Environmental Protection Agency (EPA), the California Air Resources Board (CARB), the Bay Area Air Quality Management District (BAAQMD), and information related to the project description.

### 3.5.2 Regional Setting

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The project area lies in the northern San Francisco Peninsula climatological subregion. Marine air travelling through the Golden Gate is a dominant weather factor. Wind measurements collected in San Francisco indicate a prevailing wind direction from the west and an average annual wind speed of 10.6 miles per hour.<sup>1</sup> Increased temperatures create the conditions in which ozone formation can increase.

**Criteria Air Pollutants.** As required by the 1970 Federal Clean Air Act, the United States Environmental Protection Agency (USEPA) initially identified six criteria air pollutants that are pervasive in urban environments and for which state and federal health-based ambient air quality standards have been established. USEPA calls these pollutants criteria air pollutants because the agency has regulated them by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. Ozone, carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), and lead are the six criteria air pollutants originally identified by USEPA. Since that time, subsets of particulate matter have been identified for which permissible levels have been established. These include particulate matter of 10 microns in diameter or less (PM<sub>10</sub>) and particulate matter of 2.5 microns in diameter or less (PM<sub>2.5</sub>).

The BAAQMD's air quality monitoring network provides information on ambient concentrations of criteria air pollutants at various locations in the San Francisco Bay Area. **Table 3.5-1** is a five-year summary of highest annual criteria air pollutant concentrations (2005 to 2009), collected at the BAAQMD's air quality monitoring station at 16th and Arkansas Streets, in San Francisco's lower Potrero Hill area, which is the closest monitoring station to the project site.<sup>2</sup> **Table 3.5-1** compares measured pollutant concentrations with the most stringent applicable ambient air quality standards (State or Federal).

---

<sup>1</sup> <http://www.wrcc.dri.edu/htmlfiles/westwinddir.html#CALIFORNIA>.

<sup>2</sup> Data from this single location does not describe pollutant levels throughout San Francisco, as these levels may vary depending on distance from key emissions sources and local meteorology. However, the BAAQMD monitoring network does provide a reliable picture of pollutant levels over time.

**TABLE 3.5-1: SUMMARY OF SAN FRANCISCO AIR QUALITY MONITORING DATA (2005–2009)**

Pollutant	Most Stringent Applicable Standard	Number of Days Standards were Exceeded and Maximum Concentrations Measured <sup>a</sup>				
		2005	2006	2007	2008	2009
<b>Ozone</b>						
- Days 1-hour Std. Exceeded		0	0	0	0	0
- Max. 1-hour Conc. (pphm) <sup>c</sup>	>9 pphm <sup>b</sup>	6	5	6	8	7
- Days 8-hour Std. Exceeded		0	0	0	0	0
- Max. 8-hour Conc. (pphm) <sup>c</sup>	>7 pphm <sup>c</sup>	5	5	5	7	6
<b>Carbon Monoxide (CO)</b>						
- Days 1-hour Std. Exceeded		0	0	0	0	ND
- Max. 1-hour Conc. (ppm)	>20 ppm <sup>b</sup>	2.9	2.9	2.7	5.7	ND
- Days 8-hour Std. Exceeded		0	0	0	0	0
- Max. 8-hour Conc. (ppm)	>9 ppm <sup>b</sup>	2.1	2.1	1.6	2.3	2.9
<b>Suspended Particulates (PM<sub>10</sub>)</b>						
- Days 24-hour Std. Exceeded <sup>d</sup>		0	3	2	0	0
- Max. 24-hour Conc. (µg/m <sup>3</sup> )	>50 µg/m <sup>3b</sup>	46	<b>61</b>	<b>70</b>	41	36
<b>Suspended Particulates (PM<sub>2.5</sub>)</b>						
- Days 24-hour Std. Exceeded <sup>e</sup>		0	3	5	0	1
- Max. 24-hour Conc. (µg/m <sup>3</sup> )	>35 µg/m <sup>3c</sup>	44 <sup>e</sup>	<b>54</b>	<b>45</b>	29	<b>36</b>
- Annual Average (µg/m <sup>3</sup> )	>12 µg/m <sup>3b</sup>	9.5	9.7	8.7	9.8	ND
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>						
- Days 1-hour Std. Exceeded		0	0	0	0	0
- Max. 1-hour Conc. (pphm) <sup>c</sup>	>25 pphm <sup>b</sup>	7	11	7	6	6
<b>Sulfur Dioxide (SO<sub>2</sub>)</b>						
- Days 24-hour Std. Exceeded		0	0	0	0	ND
- Max. 24-hour Conc. (ppb) <sup>c</sup>	>40 ppb <sup>b</sup>	7	6	6	4	ND
<p><i>Notes:</i>            Bold values are in excess of applicable standard. "NA" indicates that data is not available.            conc. = concentration; ppm = parts per million; pphm = parts per hundred million; ppb=parts per billion;            µg/m3 = micrograms per cubic meter            ND = No data or insufficient data.</p> <p><sup>a</sup> Number of days exceeded is for all days in a given year, except for particulate matter. PM<sub>10</sub> and PM<sub>2.5</sub> are monitored every six days and therefore the number of days exceeded is out of approximately 60 annual samples.  <sup>b</sup> State standard, not to be exceeded.  <sup>c</sup> Federal standard, not to be exceeded.  <sup>d</sup> Federal standard, not to be exceeded.  <sup>e</sup> Based on a sampling schedule of one out of every six days, for a total of approximately 60 samples per year.  <sup>e</sup> Federal standard was reduced from 65 µg/m3 to 35 µg/m3 in 2006.</p> <p>SOURCE: BAAQMD, Bay Area Air Pollution Summary, 2005 – 2009. Available online at:  <a href="http://www.baaqmd.gov/Divisions/Communications-and-Outreach/Air-Quality-in-the-Bay-Area/Air-Quality-Summaries.aspx">http://www.baaqmd.gov/Divisions/Communications-and-Outreach/Air-Quality-in-the-Bay-Area/Air-Quality-Summaries.aspx</a> and  <a href="http://www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/start">http://www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/start</a></p>						

*Ozone.* Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO<sub>x</sub>). Significant ozone production generally requires about three hours in a stable atmosphere with strong sunlight. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production. Motor vehicles are the major source of ozone precursors in the Bay Area. Ozone causes eye and respiratory irritation, reduces resistance to lung infection, and may aggravate pulmonary conditions in persons with lung disease. Ozone also damages vegetation and untreated rubber. As shown in Table 3.5-1, the state ozone standard was not violated in the past five years at the San Francisco monitoring station.

*Carbon Monoxide (CO).* Carbon monoxide is an odorless, invisible gas usually formed as the result of incomplete combustion of organic substances. Motor vehicles are the major contributors to CO generation. Ambient CO concentrations normally correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions, CO concentrations may be distributed more uniformly over an area out to some distance from vehicular sources. High concentrations of CO in respired air can impair the ability of the human body to absorb oxygen into the bloodstream, thereby aggravating cardiovascular disease and causing fatigue, headaches, and dizziness. As shown in Table 3.5-1, measured CO levels at the San Francisco monitoring station have not violated the state eight-hour standard in the last five years.

*Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>).* PM<sub>10</sub> consists of particulates 10 microns (a micron is one one-millionth of a meter) or less in diameter and PM<sub>2.5</sub> consists of particulates 2.5 microns or less in diameter. Both PM<sub>10</sub> and PM<sub>2.5</sub> represent fractions of particulate matter which can be inhaled deeply into the lungs and cause adverse health effects. Particulates in the atmosphere result from many kinds of dust- and fumes-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of these operations, such as demolition and construction activities, contribute to increases in local particulate matter concentrations, while others, such as vehicular traffic, affect regional particulate matter concentrations.

Natural sources of particulates include wind erosion from exposed surfaces. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates can also damage materials and reduce visibility.

Both PM<sub>10</sub> and PM<sub>2.5</sub> data are collected at the San Francisco station. Both PM<sub>10</sub> and PM<sub>2.5</sub> data are collected every six days with approximately 60 sampling days per year. Table 3.5-1 shows that the PM<sub>10</sub> standard was violated in two of the past five years, for a total of five days over approximately 300 sampling days. The national 24-hour standard for PM<sub>10</sub> was not exceeded during the last five years. The federal 24-hour PM<sub>2.5</sub> standard was violated in three of the past five years, for a total of nine days over approximately 300 sampling days. The state and national annual average standards for PM<sub>2.5</sub> were not exceeded during the last five years.

*Other Criteria Air Pollutants.* The standards for nitrogen dioxide, sulfur dioxide, and lead are being met within the region, and trends in historical data of ambient concentrations of these pollutants show no signs of violating state or federal standards in the future (CARB 2009).

**Non-Criteria Air Pollutants.** Toxic air contaminants (TACs) are air pollutants that may lead to serious illness or increased mortality, even when present in relatively low concentrations. Potential human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

TACs do not have ambient air quality standards, but are regulated by the BAAQMD using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis of exposure to toxic substances and human health risks from exposure to toxic substances is estimated, based on the potency of the toxic substances.<sup>3</sup>

While diesel particulate matter (DPM) was identified as a TAC by the CARB in 1998, BAAQMD monitors PM<sub>10</sub> and PM<sub>2.5</sub> concentrations only and does not currently differentiate the DPM component of particulate emissions.

**Sensitive Receptors.** Some receptors are considered more sensitive than others to air pollutants. The reasons for greater sensitivity than average include pre-existing health problems, proximity to the emissions source, or duration of exposure to air pollutants. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people in residential areas are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution, because vigorous exercise associated with recreation places a high demand on the human respiratory function.

Plant and animal species may also be sensitive to poor air quality; however, adopted state and federal air quality standards were developed to protect the health of the most sensitive human populations. The sensitivity of animals to air pollutant concentrations can vary substantially depending on an animal's lung capacity and respiration rate as well as many other factors. High ozone concentrations and accumulation of particulate matter can be damaging to sensitive plant species. The affected environment and potential impacts to biological resources is addressed separately in Biological Resources Sections 3.12 and 4.12 of the document, respectively.

---

<sup>3</sup> In general, a health risk assessment is required (for permitting approval) if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk, then the applicant is subject to a health risk assessment for the source in question. Such an assessment generally evaluates chronic, long-term effects, calculating the increased risk of cancer as a result of exposure to one or more TACs. Hazard indices are also typically calculated for acute and chronic non-cancer risks, if applicable to the TACs of concern.

The only existing residential units located immediately adjacent to the proposed streetcar track are the upper level apartments at 2765 Hyde Street, located above the Buena Vista Cafe. There are other residential buildings further back from the proposed alignment, for example the residential towers (Fontana Towers) located on North Point (between Polk and Van Ness), but these buildings are considerably more distant from the future streetcar tracks than 2765 Hyde Street. Sensitive receptors nearest the two proposed loop locations are residential condominiums on Laguna Street between North Point Street and Bay Street.

### 3.5.3 Greenhouse Gas Emissions

**State of California and City of San Francisco.** The State of California contributes approximately seven percent of US GHG emissions, making it second among the states (SFMTA 2008a). Although California has one of the lowest GHG emission rates on a per capita basis (approximately 11 metric tons per person per year), it still exceeds what is sustainable in order to stabilize the earth's climate. Furthermore, because the state has such a large population (over 36 million) that is rapidly growing (46 million projected by 2025), the impacts of California's contribution to the problem is amplified. Although the state population comprises less than 0.6 percent of the world's population, California contributes two percent of global, human generated GHGs (SFMTA 2008a). Burning fossil fuels for transportation is the primary contributor to GHG in California.

According to the San Francisco Climate Action Plan, in 2000 the City of San Francisco emitted approximately 9.7 million tons of GHGs (SF Dept. of Env. 2004). Approximately half of these emissions were generated by the transportation sector which includes all road vehicles, rail vehicles, and cross-Bay ferries. In 2000, emissions associated with transportation sources totaled approximately 5.1 million tons of CO<sub>2</sub>, an increase of 10 percent from 1990 levels. By 2010, transportation emissions are projected to increase to approximately 5.5 million tons (SF Dept. of Env. 2004).

The most efficient non-polluting forms of transportation, on a per passenger mile basis, are walking, bicycling and riding the San Francisco Municipal Transportation Agency (SFMTA) electric vehicles, which include trolley buses, light rail vehicles, historic streetcars and cable cars. Other forms of public transportation, such as BART, Caltrain and Muni's diesel buses, also emit substantially less CO<sub>2</sub> per passenger mile than driving (both single-occupant vehicles and carpools) (SFMTA 2008a). As such, one strategy for combating climate change is shifting people from automobiles to lower emitting forms of transportation. However, vehicle miles traveled in San Francisco County have been steadily increasing since 1990, and are projected to grow from 3,363 million miles in 1990 to 4,137 million miles in 2010 (SF Dept. of Env. 2004).

**Golden Gate National Recreation Area.** As part of its 2008 Golden Gate National Recreation Area Climate Change Action Plan, the National Park Service and the EPA performed a comprehensive GHG emissions inventory for the GGNRA, which did not include the San Francisco Maritime National Historical Park (NPS 2008b). The inventory was completed using the NPS's Climate Leadership in Parks (CLIP) tool, and divided emissions into three categories:

- (1) Energy, including generators, furnaces, dryers, hot water heaters, and purchased electricity;

- (2) Transportation, including vehicle miles traveled by park fleet, visitor vehicles, and the Alcatraz Ferry; and
- (3) Waste, including the emissions from wastewater treatment and municipal solid waste decomposition.

The inventory found that, in 2006, total emissions for the GGNRA equaled approximately 10,319 metric tons of carbon equivalent (MTCE). The majority of these emissions, 88 percent, were from the 13 million visitors the park receives every year, who generated an estimated 73 million vehicle miles traveling to and from the GGNRA (NPS 2008b). With the exception of emissions attributable to Alcatraz, the inventory did not break down the emissions into individual parks within the GGNRA.

**San Francisco Maritime National Historical Park.** The SF Maritime NHP conducted a separate inventory using the CLIP tool. This inventory found that, in 2008, total emissions from SF Maritime NHP totaled approximately 492 MTCE. The largest emission sector for SF Maritime NHP is energy, totaling 356 MTCE. The transportation emissions are very low because there are few places for visitors to drive within the boundaries of the park.

### 3.5.4 Regulations and Policies

#### Federal Policies

**Executive Order 13423, Issued by President George W. Bush, Jan. 24, 2007.** This Executive Order sets as a policy of the United States that “Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner” (Section 1, Policy). Goals for agencies include such measures as: improving energy efficiency and reducing GHGs of the agency through reductions of energy intensity and by requiring that renewable energy consumed by the agency comes from new renewable sources; reducing water consumption intensity; and ensuring that agencies reduce their fleet’s total consumption of petroleum products (NPS 2008b).

#### 2006 National Park Service Management Policies

**4.7.1 Air Quality.** The National Park Service has a responsibility to protect air quality under both the 1916 Organic Act and the Clean Air Act (CAA). Accordingly, the Service will seek to perpetuate the best possible air quality in parks to (1) preserve natural resources and systems; (2) preserve cultural resources; and (3) sustain visitor enjoyment, human health, and scenic vistas. Vegetation, visibility, water quality, wildlife, historic and prehistoric structures and objects, cultural landscapes, and most other elements of a park environment are sensitive to air pollution and are referred to as “air quality-related values.” The Service will actively promote and pursue measures to protect these values from the adverse impacts of air pollution. In cases of doubt as to the impacts of existing or potential air pollution on park resources, the Service will err on the side of protecting air quality and related values for future generations.

**National Parks Service Climate Friendly Parks Program.** A joint program of the U.S. Environmental Protection Agency and National Park Service, the Climate Friendly Parks Program helps parks reduce GHG emission by developing alternative transportation systems, designing and constructing sustainable facilities, and developing plans to reduce energy and water use (NPS 2008b).

**National Parks Service Pacific West Region Directive PW-047, October 31, 2006.** This directive provides policies pertaining to on-site generated renewable energy. Specifically, the conversion to renewable sources of energy is encouraged, and purchasing of Green Power (including wind, solar, biomass, and geothermal) is allowed when on-site renewable energy systems are not feasible. Alternatively purchasing Green Power Tags is also permitted (NPS 2008b).

## **State Policies**

**Executive Order S-3-05.** In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

**Assembly Bill 32 – California Global Warming Solutions Act of 2006.** California Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, was enacted in 2006 and requires the California Air Resources Board (CARB) to establish a statewide GHG emission cap for 2020 based on 1990 emission levels. AB 32 required CARB to adopt regulations by January 1, 2008, that identified and required selected sectors or categories of emitters of GHGs to report and verify their statewide GHG emissions, and CARB is authorized to enforce compliance with the program. Under AB 32, CARB was also required to adopt, by January 1, 2008, a statewide GHG emissions limit equivalent to the statewide GHG emissions levels in 1990, which must be achieved by 2020. By January 1, 2011, CARB is required to adopt rules and regulations (which shall become operative January 1, 2012), to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 permits the use of market-based compliance mechanisms to achieve those reductions. AB 32 also requires CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it adopts.

**Climate Change Scoping Plan, December 2008.** In 2008 CARB released a Scoping Plan outlining the State's strategy to achieve the 2020 GHG emissions limit (CARB 2008). This Scoping Plan, developed by CARB in coordination with the Climate Action Team (CAT), proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health. It was adopted by the Board at its meeting in December 2008. The measures in the Scoping Plan approved by the Board will be developed over the next two years and be in place by 2012. The Scoping Plan expands the list of nine Early Action Measures into a list of 39 Recommended Actions contained in Appendixes C and E of the Plan.

## Local Policies

**The Golden Gate National Recreational Area Climate Change Action Plan, December 2008.** In December of 2008 the GGNRA published its report, the Golden Gate National Recreation Area Climate Change Action Plan, with the objective of identifying actions that GGNRA can undertake to reduce GHG emissions, and thereby address climate change. The plan presents the park's emission reduction targets and associated reduction strategies designed to achieve the park's emission reduction goals. Specifically, the plan provides the GGNRA's goals and objectives, climate change background, an inventory of GHG emissions and criteria air pollutants, and four strategies: (1) Reduce GHG emissions resulting from activities within and by the Park; (2) Plan and adapt to future impacts of climate change; (3) Increase climate change education and outreach; and (4) Evaluate progress and identify areas for improvement (NPS 2008b).

**The Golden Gate National Recreational Area Environmental Management System (GGNRA EMS).** The purpose of GGNRA's EMS is a tool to be used to help ensure compliance with regulatory requirements, and maintain the Park's commitment to pollution prevention, sustainable planning, environmentally preferable purchasing, waste reduction, and the incorporation of environmental best management practices. Per requirements of Executive Order 13148, GGNRA completed its first EMS in December of 2005, and has updated the targets annually since then. Objectives and measurable goals from the Climate Change Action Plan will be included in future updates to the EMS (NPS 2008b).

**The Golden Gate National Recreational Area General Management Plan, 1980 (GGNRA GMP).** The GGNRA GMP, completed in 1980, is the master plan document for the entire GGNRA. The document describes the existing character and setting of the GGNRA and sets forth goals for future development within the park. The document is made up of two parts: the Plan, which guides development policy within the park; and The Environmental Analysis, which describes the environmental impacts The Plan may incur if implemented (NPS 1980). The GMP is currently in the process of being revised, with plans for the updated GMP to consider the goals and objectives defined in the GGNRA Climate Change Action Plan. In addition, the updated GMP will summarize the guiding principles by which GGNRA will reduce emissions, educate, and adapt to climate change over the next 20 years (NPS 2008a).

**San Francisco Maritime National Historical Park Climate Change Action Plan, 2010.** Similar to the Golden Gate National Recreation Area, the SF Maritime NHP prepared a Climate Change Action Plan with the objective of identifying actions that can be taken to reduce GHG emissions, and thereby address climate change. The plan presents the park's emission reduction targets and associated reduction strategies designed to achieve the park's emission reduction goals. Specifically, the plan provides the park's goals and objectives, climate change background, an inventory of GHG emissions and criteria air pollutants, and three strategies: (1) Identify and implement mitigation actions that the park can take to reduce GHG emissions resulting from activities within the park; (2) Increase climate change education and outreach efforts; and (3) Monitor progress with respect to reducing emissions and preserving natural and cultural resources and infrastructure and identify areas for improvement (NPS 2010a).

**San Francisco Municipal Transportation Agency (SFMTA) 2009 Climate Action Plan, 2008.** SFMTA published a draft for public review of its 2009 Climate Action Plan in December of 2008. The

Plan details policies, program, goals, funding and relationships with other City departments to reduce GHG emissions in the transportation sector and in agency operations. Specifically, the Plan discusses the City of San Francisco's emission reduction targets, establishes targets and goals for the SFMTA, describes the threat of climate change to the area, outlines how SFMTA will measure plan and program success, highlights existing climate change mitigation measures and the SFMTA's internal footprint, and identifies additional climate action programs and efforts, as well as potential and necessary next steps for the Agency (SFMTA 2008a).

**Climate Action Plan for San Francisco, September 2004.** Completed by San Francisco's Department of the Environment and Public Utilities Commission, this Climate Action Plan establishes a GHG emissions reduction target for the City of 20 percent below 1990 levels by 2012. The plan also provides background information on climate change causes and local impacts, provides a GHG inventory of City emissions, highlights actions to reduce San Francisco's GHG emissions, and develops an implementation strategy for the near term (SF Dept. of the Env. 2004).

This page intentionally left blank

## 3.6 NOISE AND VIBRATION

### 3.6.1 Noise Concepts and Terminology

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), a logarithmic loudness scale with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Because sound pressure can vary by over one trillion times within the range of human hearing, the logarithmic loudness scale is used to calculate and manage sound intensity numbers conveniently.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements.

Given the variation of community noise level from instant-to-instant, community noise levels must be measured over an extended period of time to characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

- $L_{eq}$ : The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The  $L_{eq}$  is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
- $L_{max}$ : The instantaneous maximum noise level measured during the measurement period of interest.
- $L_x$ : The sound level that is equaled or exceeded x percent of a specified time period. The  $L_{50}$  represents the median sound level (i.e., the noise level exceeded 50 percent of the time).
- DNL: The day-night average sound level (DNL, also written as  $L_{dn}$ ) is the energy average of the A-weighted sound levels occurring during a 24-hour period, accounting for the greater sensitivity of most people to nighttime noise by weighting ("penalizing") nighttime noise levels by adding 10 dBA to noise between 10:00 p.m. and 7:00 a.m.
- CNEL: Similar to the DNL, the Community Noise Equivalent Level (CNEL) adds a 5-dBA "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to the 10-dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

**SEL:** The sound exposure level (SEL) is a time integrated metric which quantifies the total energy in A-weighted noise level measured during a particular single event referenced to time duration of 1 second.

### 3.6.2 Vibration Concepts and Terminology

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The peak particle velocity (PPV) is usually used to describe vibration amplitudes. PPV is defined as the maximum instantaneous peak of the vibration signal. Since ground-shaking speeds are generally quite low, it is measured in inches per second (in/s). Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Man-made vibration issues are therefore usually confined to short distances (i.e., 500 feet or less) from the source.<sup>1</sup> Standard industry damage criteria and "safe levels" of ground motion are generally based on particle velocity and frequency of motion. The response of humans to ground motion is primarily influenced by ground motion velocity and duration of the motion.

Persons not familiar with vibration science often confuse particle velocity values with ground displacement. For instance, if a measured peak or maximum particle velocity is 0.25 inches per second, the ground has *not* moved a quarter of an inch. The actual temporary particle movement or displacement would be much less because in one second of time, ground particles disturbed by vibration waves will oscillate back and forth many times in a second.

Another useful vibration descriptor is known as vibration decibels or VdB. VdB's are generally used when evaluating human response to vibrations, as opposed to structural damage, where PPV is the more commonly used descriptor. Vibration decibels are established relative to a reference quantity, typically  $1 \times 10^{-6}$  inches per second.<sup>2</sup>

### 3.6.3 Soundscapes

In a park setting, a natural soundscape is an area characterized by certain characteristic sound sources at detectable sound levels which typically occur without the intrusion of sounds caused by humans or human technology. Park natural soundscape resources encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the interrelationships among park natural sounds of different frequencies and volumes. Natural sounds occur within and beyond the range of sounds that humans can perceive, and they can be transmitted through air, water, or solid materials (NPS 2006).

The natural soundscape is viewed as a resource and as a value to be appreciated by visitors. Many park visitors have an expectation of seeing, hearing and experiencing phenomena associated with a specific natural environment. While the Fort Mason Center and SF Maritime NHP are located in an urbanized

---

<sup>1</sup> Federal Transit Administration, Transit Noise and Vibration Impact Assessment, 2006.

<sup>2</sup> Ibid.

area of San Francisco, natural soundscape elements such as sea birds and tidal motions of the bay can be heard around western Aquatic Park.

The study area may be characterized as being located within a cultural or historic soundscape as the result of its location on the San Francisco waterfront and the noise sources that have historically been associated with its maritime locale. These noise sources would include bells from cable car operations of the Hyde/Powell Street line and occasional ship navigational aids such as fog horns at the Golden Gate Bridge and directional horn warnings used by cargo ships within the maritime traffic lanes.

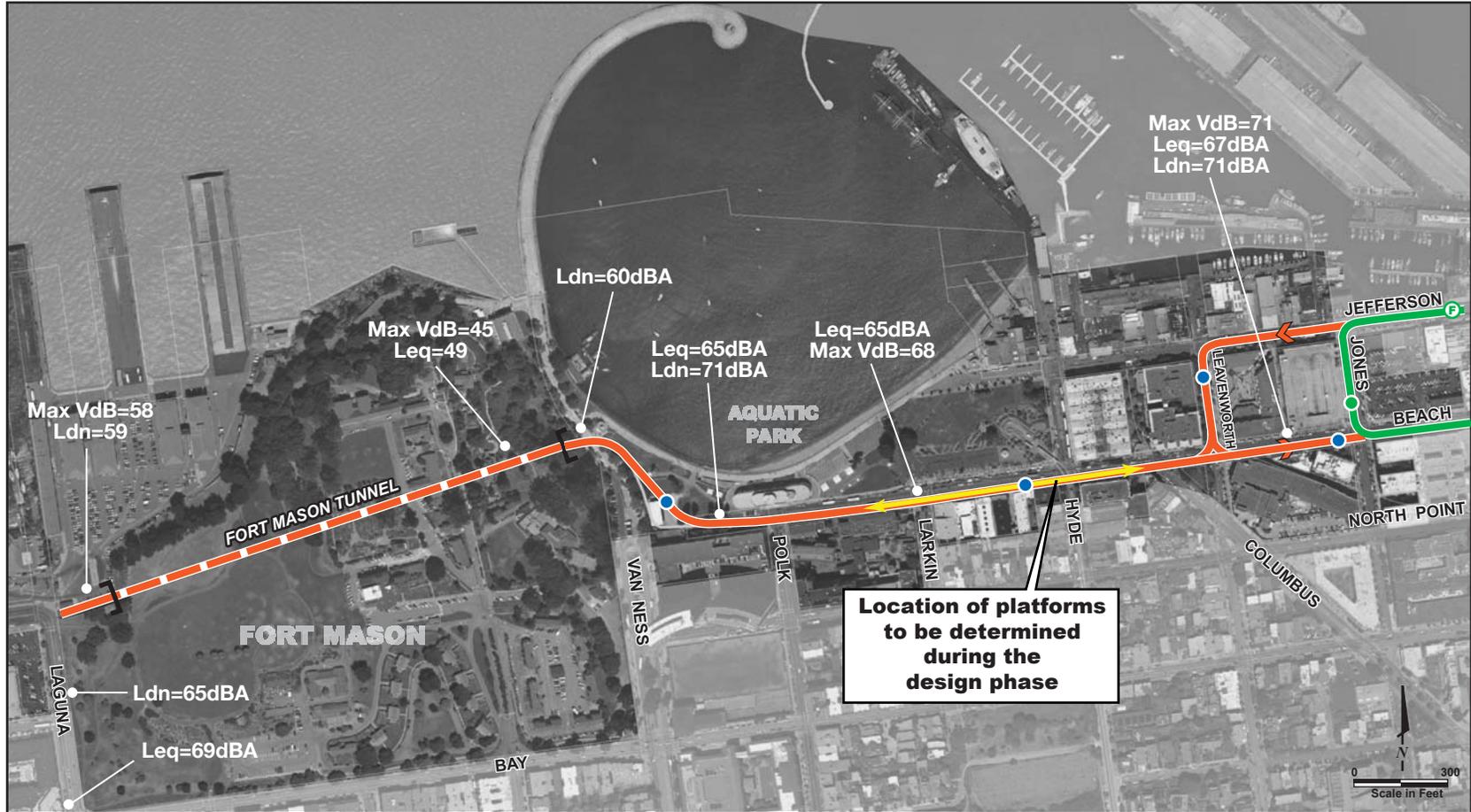
#### **3.6.4 Ambient Noise Environment**

Ambient noise levels in the project area were measured during noise monitoring surveys conducted in 2006 and 2008 (Wilson Ihrig 2009). **Figure 3.6-1** shows the locations where noise and vibration measurements were taken. The highest noise levels measured during the noise surveys were generally obtained along Beach, Jefferson, Leavenworth and Jones Streets; the streets in the study area with the highest traffic volumes. The Day-Night Average Sound Level (Ldn) values obtained at the long-term monitoring locations and the Ldn values estimated at the short-term monitoring locations, along these streets, were either close to or above 70 dB. Daytime hourly average Leq values at these locations were monitored to be 68 dB. These levels are fairly typical of busy urban streets. At the monitoring location near the NHL Aquatic Park Bathhouse Building (Maritime Museum) and near the western end of Beach Street, just past this building, the noise levels were typically below 65 dB Ldn due to the lower traffic volumes in this area. At the park area near the east portal of the abandoned tunnel the noise levels were typically below 60 dB Ldn. Daytime hourly average Leq values at this location was monitored to be 49 dB.

Upper Fort Mason is generally a comparatively quiet area, apart from the southern part closest to Bay Street, with existing noise levels below 60 dB Ldn in the areas closest to the rail tunnel. The residences near the tunnel are some distance from Bay Street and there is usually little traffic on the roads within Upper Fort Mason. Fort Mason Center is also comparatively quiet, with existing noise levels of approximately 60 dB Ldn at the south end of Landmark Buildings B and C. Daytime hourly average Leq values at this location was monitored to be 65 dB. The main noise source in this area is traffic movements into and out of the parking lot. Noise levels are somewhat higher due to traffic in the vicinity of Laguna and North Point Streets where the existing noise levels are typically greater than 65 dB Ldn near the streets, but generally 2 to 3 dB lower when away from Laguna Street and in the park area.

#### **3.6.5 Ambient Vibration Environment**

At the monitoring locations along streets with high traffic volumes in the study area where there are no streetcar operations, the ground vibration levels were monitored to be typically less than 70 VdB, and the vibration was not, subjectively, noticeable. This includes the corner of Beach Street and Larkin Street, approximately 350 feet from the Maritime Museum.



Source: Wilbur Smith Associates, 2004; NPS

**LEGEND**

- F Market (existing)
- Fort Mason Extension (proposed)
- Platform (existing)
- Platform (proposed)\*

**NOISE AND VIBRATION MONITORING LOCATIONS AND VALUES**



Environmental Impact Statement  
Historic Streetcar Extension  
San Francisco, California

FIGURE 3.6-1

\* Platform locations are for illustrative purposes only and subject to change. Final platform locations will be determined through a separate local planning process that will take into account operational and design considerations, as well as public comment.

The ground vibration levels at the monitoring locations in Upper Fort Mason and in the Fort Mason Center were relatively lower. The maximum vibration level recorded during the 15-minute sample at the south end of Landmark Building A in the Fort Mason Center was 58 VdB. The maximum vibration level recorded during the 15-minute sample on the sidewalk in front of Buildings 232 and 234 in Upper Fort Mason was 45 VdB. These levels are well below the threshold of human perception.

### 3.6.6 Noise and Vibration Sensitive Land Uses

Existing buildings and facilities that would be located adjacent to the extended streetcar line between Jones Street and the entrance to the rail tunnel (below Upper Fort Mason) include:

- The Holiday Inn Hotel at 1300 Columbus Avenue.
- The Courtyard by Marriott at 580 Beach Street.
- The Argonaut Hotel at 495 Jefferson Street.
- The Cannery, located adjacent to The Argonaut Hotel and bounded by Jefferson, Beach, and Leavenworth Streets. The Cannery has shops, restaurants, offices, and a jazz club
- The cable car turnaround at Hyde and Beach Streets and the neighboring park and seafront areas, which extend to the west beyond the disused rail tunnel entrance.
- Ghirardelli Square at 900 North Point Street, which has shops, restaurants, residences and galleries.
- San Francisco Senior Center at 890 Beach Street in the NHL Aquatic Park Bathhouse Building (Maritime Museum).
- The NHL Aquatic Park Bathhouse Building (Maritime Museum) at 900 Beach Street.
- Other commercial/office buildings, shops, galleries, cafe/restaurants and bars.
- The West Roundhouse (“Convenience Station”)

The only existing residential units located immediately adjacent to the proposed streetcar track are the upper level apartments at 2765 Hyde Street, located above the Buena Vista café and newly available residential units on the upper floors of Ghirardelli square at 900 North Point (with frontage on Beach Street). There are other residential buildings further back from the proposed alignment, for example the residential towers (Fontana Towers) located on North Point (between Polk and Van Ness), but these buildings are considerably more distant (about 250 feet) from the future streetcar tracks than those on Hyde Street.

The existing abandoned rail tunnel is almost directly below some of the historic residential buildings in Upper Fort Mason. Buildings 2, 7, 11, 231, 232, and 235 are the closest residential buildings to the tunnel.

Fort Mason Center is a multicultural center, which hosts events, conferences, performances and exhibits. The facilities in the five Landmark Buildings (A through E) at the Fort Mason Center include:

- Offices;
- Conference areas;

- Theaters;
- Meeting/activity spaces;
- Restaurant;
- Bookstore;
- Library; and
- Educational facilities (including a school of music).

The five Landmark Buildings could be as close as 80 feet to the turnaround track, depending on the final selected location. The pavilions and other facilities on the three piers are considerably more distant from the proposed alignment and turnarounds (400 feet or more).

Residential land uses nearest the two proposed turnaround loop locations are condominiums on Laguna Street between North Point Street and Bay Street, approximately 400 feet from the northern loop and 100 feet from the southern loop.

### 3.6.7 Regulations and Policies

**2006 National Park Service Management Policies.** The 2006 National Park Service Management Policies delineate its Soundscape Management Policies. These policies are designed in accordance with the Organic Act of 1916 and strive to manage National Parks in a way that will preserve them for the enjoyment of future generations. The National Park Service will preserve, to the greatest extent possible, the natural soundscapes of parks. Some natural sounds in the natural soundscape are also part of the biological or other physical resource components of the park. Examples of such natural sounds include:

- Sounds produced by birds, frogs, or katydids to define territories or aid in attracting mates;
- Sounds produced by bats or porpoises to locate prey or navigate;
- Sounds received by mice or deer to detect and avoid predators or other danger;
- Sounds produced by physical processes, such as wind in the trees, claps of thunder, or falling water.

National Park Service will restore to the natural condition wherever possible those park soundscapes that have become degraded by unnatural sounds (noise), and will protect natural soundscapes from unacceptable impacts. Using appropriate management planning, superintendents will identify what levels and types of unnatural sound constitute acceptable impacts on park natural soundscapes.

The frequencies, magnitudes, and durations of acceptable levels of unnatural sound will vary throughout a park, being generally greater in developed areas. In and adjacent to parks, National Park Service will monitor human activities that generate noise that adversely affect park soundscapes, including noise caused by mechanical or electronic devices. National Park Service will take action to prevent or minimize all noise that through frequency, magnitude, or duration adversely affects the

natural soundscape or other park resources or values, or that exceeds levels that have been identified through monitoring as being acceptable to or appropriate for visitor uses at the sites being monitored.

**Director's Order 47 – Soundscape Preservation and Noise Management.** Directors Orders are one of several types of written guidance created for the proper management of national parks. The key directive from Director's Order 47 is that where natural soundscape conditions are currently not impacted by inappropriate noise sources, the objective must be to maintain those conditions. Where the soundscape is found to be degraded, the objective is to facilitate and promote progress toward the restoration of the natural soundscape. There are eleven instructions and requirements outlined in Director's Order 47.

**Local Noise Regulations.** San Francisco's Plan for Transportation Noise Control (a section of the Environmental Protection Element) provides guidance on the environmental noise levels that are considered generally acceptable for residential and other land uses. The Plan provides land-use compatibility guidelines in terms of the Day-Night Average Sound Level (Ldn). The compatibility guidelines for single-family and multi-family residential land uses identify the following categories:

- Areas with an Ldn of less than 60 dB are considered satisfactory for residential development, with no special building noise insulation requirements.
- Areas with an Ldn of between 60 and 70 dB are identified as conditionally acceptable for residential land uses, pending an assessment of the need for and installation of noise insulation features, typically identified in a noise study report.
- Areas with an Ldn above 70 dB are generally considered incompatible with residential land uses and development of residences in these areas are generally discouraged.

With regard to construction noise, the San Francisco Noise Ordinance (Article 29 of the San Francisco Police Code) prohibits the operation of any powered construction equipment emitting noise at a level in excess of 80 dBA at 100 ft., or an equivalent sound level at some other distance. This limit does not apply to impact tools and equipment, such as pile drivers, pavement breakers, and jackhammers, provided such equipment is fitted with approved noise control features.

This page intentionally left blank

## 3.7 CULTURAL RESOURCES

### 3.7.1 Introduction

The following section summarizes the results of previous studies developed for the project area, provides the cultural resource context, and establishes the regulatory framework for the undertaking.<sup>1</sup> Section 106 Regulations (36 CFR Part 800.8) state that preparation of an EIS and ROD under NEPA should include appropriate scoping, identification of historic properties, assessment of effects upon them, and consultation leading to resolution of any adverse effects. To that end, this section identifies historic properties and Chapter 4.0 will assess the effects (or impacts) of the project (or undertaking) on these historic properties.

### 3.7.2 Area of Potential Effect

An area of potential effect (APE) describes the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. The APE for this undertaking was identified in a letter to the State Historic Preservation Officer (SHPO), Wayne Donaldson, FAIA, dated August 2, 2007. See **Figure 3.7-1 – APE Map**. SHPO concurred with the proposed APE in a letter dated December 3, 2007 (see Appendix C). The boundaries of the APE generally encompass an area from Taylor Street to the east, Laguna Street to the west, the San Francisco Bay to the north, and Bay Street to the south.

### 3.7.3 Cultural Setting

**Pre-contact Setting.** Human settlement of the San Francisco Bay region began sometime during the early Holocene period ca. 10,000 years ago. During this period, the mean sea level elevation was considerably lower than today and the area now encompassed by the San Francisco Bay was over 30 miles inland from the coastline. Sea levels rose and, by 8,000 years ago, marine waters began to inundate San Francisco Bay. Except for brief periods, the mean sea level has been at or above its present level for some 6,000 years (Moratto 1984:221-223).

Archeological investigations in the San Francisco Bay Area have generally concentrated on the littoral regions bordering the bay, and concentrated on large shellmound sites. The first detailed survey of the Bay Area was by N. C. Nelson from 1906-1908 along the coast from Half Moon Bay to the Russian River (Nelson 1909). This survey resulted in the documentation of 425 midden deposits<sup>2</sup> including Ca-SFr-2 near the current intersection of Third and Harrison Streets, and Ca-SFr-7 near Hunters Point.

<sup>1</sup> An undertaking as defined by Section 106 Regulations (36 CFR Part 800) means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval.

<sup>2</sup> A midden is a mound of domestic refuse generally containing culturally darkened soils, shells and animal bones, as well as other indices of past human life and habitation. Middens mark the site of an indigenous settlement, and may contain human burials related to that settlement.



Source: Page & Turnbull

- APE Boundaries
- Parcels Surveyed
- Identified Historic Properties

## AREA OF POTENTIAL EFFECT

Environmental Impact Statement  
Historic Streetcar Extension  
San Francisco, California



FIGURE 3.7-1

Data from these and later excavations were used to extend the Central California Taxonomic System (CCTS) classifications of the Central Valley cultures to include those in the San Francisco Bay area (Beardsley 1954). One feature of the CCTS is the designation of “horizons,” broad cultural units with temporal characteristics. The system recognizes three cultural horizons: Early, Middle, and Late. Each cultural horizon is defined by groups of diagnostic traits and characteristic artifacts called facies. Groups of facies comprise a province. The facies and province were defined both culturally by characteristic traits and artifacts, as well as spatially by the locales where the facies were found.

By circa 500 B.C., Ohlone/Costanoan peoples occupied essentially the same territory that they would until Euro-American contact (Moratto 1984:279). This territory extended from the Carquinez Strait southward to the Sur River and from the Pacific coast eastward to the Diablo Range (Kroeber 1976:462; Moratto 1984:225). The San Francisco Peninsula was occupied by speakers of Ramaytush or San Francisco Costanoan, one of eight Ohlone/Costanoan Indian languages spoken in California. Costanoan is derived from the Spanish term *Costanos* for “coast people”; however, it does not represent a cohesive ethnic group, and is no longer widely used to refer to the people of the region, who generally prefer the name Ohlone. Instead, Costanoan is a linguistic division, grouping eight languages together due to their phonological similarities. Together with the Miwokan languages, Costanoan comprises the Utian Family of languages. In turn, the Utian Family is part of the larger Penutian Linguistic Stock (Kroeber 1976; Levy 1978; Moratto 1984; Shipley 1978; Milliken 1995).

Ohlone territory was significantly affected by Spanish colonialism in California. Between 1769 and 1776, seven Spanish expeditions entered the Ohlone lands and, by the close of the eighteenth century, seven missions had been established. At the time of these early contacts approximately 10,000 Ohlone Indians existed, comprising roughly 50 politically autonomous community groups (Cook 1943a; 1943b).

The Ohlone, like most aboriginal Californians, possessed no larger socio-political organization than small local tribes comprised of 50-500 people (Kroeber 1976; Levy 1978). Groups were generally composed of one or more loosely affiliated villages and associated logistical camps situated within a recognized territory. Leadership was inherited patrilineally, generally passing from father to son, although women could also hold the office (Levy 1978:487).

The subsistence strategy of the Ohlone peoples revolved around the procuring of wild vegetal and animal foodstuffs. Vegetal products were gathered as they became seasonally available, and then were either consumed or stored for future use. Acorns, if regularly available, were the staple plant food. If a particular group inhabited an area devoid of oaks (e.g., the coast), then seed procurement predominated (Kroeber 1976:467; Levy 1978:491).

Fish and mollusks were a significant component of the diet. Salmonids (i.e., steelhead and salmon) were captured during their spawning migrations by hook and line or seine nets. Mussels and abalone were simply pried from the coastal rocks. Kroeber (1976:466) stated that the shellmounds situated around San Francisco Bay are the richest in California, “except perhaps the Santa Barbara Islands,” attesting to the importance of mollusks to aboriginal sustenance in this vicinity. He further noted that it is probable that “the upper layers of nearly all” of the shellmounds (within Ohlone territory) “must accordingly be ascribed to the Costanoans” (Kroeber 1976:466).

**Historic-Period Setting.** As a result of the Cabrillo expedition of 1542-1543, the southbound passage of the Manila Galleon along the coast after 1565, and subsequent voyages of exploration by Cermmenho in 1597 and Vizcaino in 1602, the California coastline was familiar to navigators by the end of the sixteenth century (Donley et al. 1979). Conversely, the interior remained unknown until the eighteenth century. Initial European exploration of the Project vicinity was initiated in 1769 and lasted until 1810. During this period, a number of Spanish expeditions penetrated the territory occupied by the Costanoan peoples. Between 1769 and 1776, forays led by Portola, Ortega, Fages, Fages and Crespi, Anza (two expeditions), Rivera, and Moraga were carried out. Favorable reports led to the founding of seven missions in the region between 1770 and 1797.

In the spring of 1776, the site of San Francisco was chosen by Juan Batista Anza for the establishment of a mission and military post. Later that same year, the Mission San Francisco de Asís (also known as Mission Dolores) and Presidio de San Francisco were officially dedicated and Jose Joaquin Moraga (Anza's lieutenant) took formal possession in the name of King Carlos III (Hoover et al. 1990:331-334).

Several local tribes of the San Francisco bayshore moved to Mission Dolores in their entirety. The Yelamu local tribe, no more than 160 individuals, held the tip of the San Francisco Peninsula north of San Bruno Mountain. The greater part of the Peninsula lands of the GGNRA, including the Presidio, Fort Funston, Fort Mason, Fort Miley, Lands End, Ocean Beach, and Alcatraz Island, were within their territory. Most Yelamu people were baptized between 1777 and 1784 at Mission Dolores (Milliken et al. 2009).

The Spanish annexation and colonization of Alta California, as manifested in the religious-military mission system, produced profound changes in the cultures of the indigenous population. The missions resettled and concentrated the aboriginal hunter-gatherer population into agricultural communities. The concentration of population, coupled with the indigenous people's lack of immunity to European diseases, caused the tribes to be decimated by common diseases which were generally not fatal to Europeans. It has been estimated that the Ohlone population declined from 10,000 or more in 1770 to less than 2,000 in 1832 (Levy 1978:486).

Jurisdiction over Alta California was established by Mexico in April of 1822. During the Mexican Period (1822-1848), control over this remote area by the central and local Mexican authorities was never strong.

A major factor leading to the disintegration of Mexican control of California was pressure from the United States. Initial contacts were made by private citizens, such as the November 1826 visit by Jedediah Smith to the San Gabriel Mission and the 1832 stop by Ewing Young at Los Angeles. These and other sojourners brought the news of California back to the United States, helping trigger the immigration of U.S. citizens into California. The continued friction between Mexico and the United States ultimately led to the Mexican War of 1846-1847. On July 9, 1846, a crew from the sloop-of-war USS *Portsmouth* came ashore and raised the first American flag over San Francisco (Beck and Haase 1974:47; Hoover et al. 1990:336). However, as Mexico had ceased stationing regular troops in San Francisco following secularization (Hoover et al. 1990:331), the raising of the flag was a symbolic gesture rather than a result of heroic exuberance.

California became part of the United States as a consequence of the U.S. victory over Mexico in the war. The territory was formally ceded in the treaty of Guadalupe Hidalgo in 1848, and was admitted as a state in 1850 (Beck and Haase 1974).

Prior to the discovery of gold at Sutter's Mill on January 24, 1848, development in San Francisco consisted of the Spanish/Mexican facilities (i.e., the Presidio and Mission) and a small settlement known as Yerba Buena situated on the shores of the cove by the same name. The inhabitants of Yerba Buena were predominantly non-Spanish, English-speaking immigrants (e.g., U.S. or British citizens). Sometime before the gold rush, the inhabitants of Yerba Buena officially changed the name of their settlement to San Francisco. Following the discovery of gold, San Francisco transformed rather quickly from an isolated hamlet into a bustling center of commerce (Hoover et al. 1990:334-336; Kemble 1957:7). According to historic accounts cited by Hupman and Chavez (1995:56), after the discovery of gold, the population of San Francisco grew from 375 people in 1847 to 2,000 by February 1849, and by the end of 1849, there may have been as many as 20,000 people living in the city.

The APE includes several areas with distinct historical identities and themes. These include the military reservation and Port of Embarkation at Fort Mason and recreational facilities at Aquatic Park, as well as scattered remnants of industrial facilities that once dominated the area.

Inspired by the booming gold industry in the west, and escaping economic instability at home, throngs of Italian immigrants came to the growing city of San Francisco in the middle of the nineteenth century (Dendero 1950). With backgrounds in agricultural and aquatic industries, Italian Americans soon began to make a significant impact in the local economies. Near the Project APE was the site of the original Italian boat basin which serviced the burgeoning commercial fishing industry. It was relocated in 1902 during reclamation efforts to its present day site of Fisherman's Wharf. By 1910, the Italian fleet at Fisherman's Wharf included over 700 vessels and 2,500 crewmen (Dillon 1985).

One of the most prominent of the Italian immigrants was Dominico (Domingo) Ghirardelli. In 1847, he opened a store which provided general goods and supplies catering to Italian miners (Dillon 1985). His business proved successful and continued to grow. He made a name by selling confections and developing his famous "broma" chocolate for which the company is primarily known. By 1881, his sons had taken to running the family business, and with expansion looming, moved the company into the then vacant Pioneer Woolen Mills located within Black Point Cove (Delgado 1981).

Prior to the Gold Rush, a portion of the eastern end of the APE was completely submerged beneath the waters of San Francisco Bay, since the original shoreline was south of Jefferson Street. The two most prominent features along the shore were Tonquin Point, a tall, sandy dune jutting out into the bay roughly along the line of present-day Hyde Street, and the natural headland at Black Point (now Fort Mason). Between the two was a large curving cove, portions of which were later developed as Aquatic Park.

The Fort Mason area served as a strategic Spanish (1794-1821), and then Mexican (1821-1848) military post until California was ceded to the United States in 1848. Black Point was recognized early on for its military potential, and was reserved for use of the military almost immediately after California achieved statehood. Feeling threatened by the settlement boom of the Gold Rush, the U.S. government issued an executive order in 1850, setting aside 10,000 acres of land for military use on the San Francisco peninsula.

After nearly 20 years of inconsistent military use of the original installation, the size was dramatically reduced to its current state. Honoring Colonel Richard Barnes Mason, the post was renamed “Fort Mason” in 1882 (NPS 2004b).

To the east of Black Point, the water depths were considered too shallow for general shipping, but the location did prove attractive for commercial enterprises requiring large volumes of water. Beginning in the 1850s, several businesses located industrial facilities here, notably the Selby Lead and Smelting Company, and the Pioneer Woolen Mills—later purchased by D. Ghirardelli & Company and converted for use as a chocolate factory. Columbus Avenue, a natural pass between Russian Hill and Telegraph Hill, was developed in the 1870s to connect the area with downtown San Francisco.

Development intensified in the early years of the 20th century. In 1900, San Francisco’s fishing fleet was relocated from the Union Street Wharf near downtown to its present location. This development coincided with widespread filling activities in the Bay, especially after the 1906 Earthquake and Fire, when thousands of truckloads of rubble and debris were hauled over from Chinatown and North Beach and used to fill areas near Fisherman’s Wharf and Aquatic Park.

At the turn of the 20th century, San Francisco’s fishing industry was among the busiest on the continent, processing more fish than all the combined ports from Washington State to Mexico. In 1914, the State Harbor Commission constructed two bulkhead wharves for the use of the fishing fleet. Around the same time, the State Belt Line Railroad—San Francisco’s waterfront rail system—was extended along Jefferson Street across the cove at Aquatic Park to Fort Mason. At this location, a tunnel beneath the Fort connected the rail line with the Sierra & San Francisco steam plant to the west, as well as recently filled land then being developed for the 1915 Panama Pacific International Exhibition. The extension of the railroad would prove critical during the coming World Wars, when Fort Mason served as a supply depot, and later as a port of embarkation.

The 80 years following 1850 saw Fort Mason undertake various military and civil duties. In the 1890s, upgrading to new weapon technologies, the military installed a series of high-powered artillery at the mouth of the bay. However, Fort Mason’s more easterly position rendered it less important for this type of defense and its posts were some of the first to be abandoned. After the 1906 earthquake, the grounds of Fort Mason were used to temporarily house some of the city’s displaced inhabitants. Nearly ten years later, these same grounds were adopted by the Panama Pacific International Exposition, which left behind various components of site infrastructure, including the most relevant to this project, an electric streetcar line. World War I and World War II saw some military activity at the Fort; however, with the advent of new transportation technologies, the military importance of the Fort waned. In 1972, Fort Mason was transferred to the National Park Service, and continues to be run by the National Park Service (NPS) today (NPS 2004b).

For the first half of the 20th century, the area east of Fort Mason continued to be dominated by fishing and industrial production, although changes were on the way. In the 1930s, Fisherman’s Wharf was divided into three basins, followed closely by the development of the Aquatic Park Bathhouse and associated facilities. Aquatic Park was one of the largest Works Progress Administration (WPA) projects, and was largely completed between 1936 and 1939. Aquatic Park, a formal designed landscape, encompassed several buildings and structures including: the Bathhouse with flanking

amphitheater structures, two speaker towers, Convenience Stations, one with a concessions stand, a Seawall, the Promenade, and Municipal Pier. The most notable building on the site, the Bathhouse, is a Streamline Moderne masterpiece with highly significant interior spaces. This building marked a long tradition of water recreation in the area. At least as early as the 1880s, bathers congregated in the cove to enjoy its warm waters—the result of heated industrial discharge from nearby facilities such as the Pioneer Woolen Mills. Aquatic Park eventually became known for several accomplishments, including: the first formal Senior Citizens Center; the grandiose Works Progress Administration projects, which encompassed construction, architectural styling, and artwork in the various buildings and structures; its extensive and noteworthy social work programs developed in California during the Depression; as the headquarters of the Anti- Aircraft Defense of the Pacific Coast; and as a locally-significant example of community planning. In the late 1940s, the military uses of Aquatic Park departed for a nearby site, thus relegating Aquatic Park to its recreational uses. In 1951 the Aquatic Park Bathhouse Building, already home to the San Francisco Senior Center, became home to the San Francisco Maritime Museum.

One byproduct of the increased development in the area came in the form of restaurants, which in the 1930s began to relocate to Fisherman’s Wharf both for access to fresh fish and to take advantage of the colorful scenery. By the 1950s—the same time that many west coast fisheries began to decline in earnest—many fishing operations at the Wharf likewise became increasingly focused on the steadier and more lucrative opportunities offered by the restaurant and tourist trade. This trend intensified in the latter half of the century, with fishing and industrial production steadily giving way to businesses focused on tourism. In the 1960s, both the Ghirardelli chocolate factory and the California Fruit Cannery Association Cannery (now known as the Cannery) were redeveloped as shopping complexes. Nearby, the Hyde Street ferry terminal became the site of a maritime state park in the late 1950s, and then, along with Aquatic Park, became the heart of the San Francisco Maritime National Historical Park in 1988. Within a few years the warehouses, boat building shops, lumber and rail yards that had once been common were being rapidly replaced with hotels, restaurants and other commercial businesses. Fort Mason ceased to function as a military facility and became part of the Golden Gate National Recreation Area in 1972. Today the Fisherman’s Wharf area is considered the center of tourist activities in San Francisco.

### **3.7.4 Regulations and Policies**

Numerous federal laws, statutes, and regulations have been enacted to protect the country’s cultural heritage. The most applicable regulations to the proposed undertaking are summarized below.

**American Antiquities Act (1906).** The federal government formally recognized the importance of cultural resources with passage of the American Antiquities Act of 1906 (16 United States Code (USC) 431-433). This act, with its implementing regulation 43 Code of Federal Regulations (CFR) Part 3, protects historic and prehistoric resources on federal lands and prohibits excavation or destruction of cultural resources. Jurisdiction over resources on federal lands is given to the respective Department with authority on those lands. The Act also authorizes the President to declare areas of public lands as National Monuments and to reserve or accept private lands for that purpose.

**Historic Sites Act, as amended (1935).** The Historic Sites Act (16 U.S.C. 461-467) established the National Historic Landmark program for historic and archeological sites, buildings, and objects of national significance. The Act directs the National Park Service, on behalf of the Secretary of the Interior, to evaluate, acquire, restore/maintain, and manage such properties for the benefit of the public, and to identify them with a tablet to “commemorate historic or prehistoric places and events of national historical or archeological significance.” The NPS Advisory Board and NPS Advisory Council are also established by this Act.

**National Historic Preservation Act, as amended (1966).** Cultural resources are protected through the NHPA of 1966, as amended (16 U.S.C. 470 et seq.), and its implementing regulation, Protection of Historic Properties (36 CFR Part 800). Under the NHPA, a cultural resource is considered significant if it meets the Criteria for Evaluation (36 CFR 60) for the National Register of Historic Places (NRHP, National Register).

Prior to implementing an “undertaking” (i.e., “a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval”), Section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO) a reasonable opportunity to comment on any undertaking that would potentially affect properties listed or eligible for listing in the National Register. The lead federal agency is responsible for Project compliance with Section 106 of the NHPA.

The NHPA also provides heightened protection for designated National Historic Landmarks (NHLs) through Section 110(f) and the NHPA’s implementing regulations (36 CFR 800.10). National Historic Landmarks are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States. Specifically, the NHPA requires that Federal Agencies shall, to the maximum extent possible, “undertake planning and actions necessary to minimize harm to any NHL that may be directly and adversely affected by an undertaking.”

**National Register of Historic Places.** The National Register was established by the NHPA of 1966, as “an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the Nation’s historic resources and to indicate what properties should be considered for protection from destruction or impairment” (36 CFR 60.2). The National Register recognizes both historic and prehistoric properties that are significant at the national, state, and local levels.

To be eligible for listing in the National Register, a resource must be significant in American history, architecture, archeology, engineering, or culture. As indicated in Section 101(d)(6)(A) of the NHPA, properties of traditional religious and cultural importance to an Indian tribe are eligible for inclusion in the National Register. Districts, sites, buildings, structures, and objects of potential significance must meet one or more of the following four established criteria (36 CFR 60.4):

- A. Are associated with events that have made a significant contribution to the broad patterns of our history;

- B. Are associated with the lives of persons significant in our past;
- C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for National Register listing (36 CFR 60.4).

In addition to meeting the criteria of significance, a property must have integrity, meaning the ability of a property to convey its significance. The National Register recognizes seven qualities that, in various combinations, define integrity. To retain historic integrity a property must possess several of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance. The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association (36 CFR 60.4).

**Archeological and Historic Preservation Act, as amended (1974).** The Archeological and Historic Preservation Act (AHPA) (16 USC 469-469c) requires that federal agencies provide for the preservation or recovery of important scientific, historical, or archeological data that may be destroyed as a result of federal undertakings, or through federal funding or licensing of projects. Emergency projects, such as those related to a natural disaster, are exempt from compliance with AHPA if implementation of AHPA would impede the project.

**American Indian Religious Freedom Act (1978).** The American Indian Religious Freedom Act (codified at 42 USC 1996, et seq. and regulated under 43 CFR 7) protects the right of American Indians, Eskimos, Aleuts, and Native Hawaiians to practice and express their traditional religious beliefs and ceremonies. It also insures their access to sacred sites, as well as the use and possession of sacred objects. The act further directs federal entities to evaluate their policies and procedures in consultation with Native American traditional religious leaders to determine changes necessary to protect and preserve Native American cultural and religious practices.

**Archeological Resources Protection Act (1979).** The Archeological Resources Protection Act (ARPA) was enacted primarily to better protect archeological resources and to increase scientific knowledge of archeological resources. ARPA provides for federal permitting of scientific investigation of archeological resources, substantial penalties for unauthorized removal, desecration or trafficking of archeological resources, increased public awareness of the importance of archeological resources, and for enhanced management of archeological resources. ARPA also encourages communication and interaction between professional and avocational archeologists.

**Native American Graves Protection and Repatriation Act (1990).** The Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001 et seq.) provides for the protection and return of Native American and Native Hawaiian human remains, funerary objects, sacred objects, and objects of cultural patrimony, and establishes ownership hierarchy for human remains and associated artifacts found on federal lands. NAGPRA also sets penalties for violations of the act, calls for cultural

resource inventories of federal agency holdings and federally-funded repositories, and contains provisions for the return of specified cultural items to the appropriate Native American tribe(s) and/or Native Hawaiian organization(s). NAGPRA is initiated when the project and the finds are situated on federal lands.

**Abandoned Shipwreck Act (1987).** The Abandoned Shipwreck Act (43 USC 2101–210), is a federal-level legislative act but it does protect shipwrecks found in state waters. The Abandoned Shipwreck Act also states that the laws of salvage and finds do not apply to abandoned shipwrecks protected by the act.

## 2006 National Park Service Management Policies

*5.3.5 Treatment of Cultural Resources.* The Park Service will provide for the long-term preservation of, public access to, and appreciation of the features, materials, and qualities contributing to the significance of cultural resources. With some differences by type, cultural resources are subject to several basic treatments, including (1) preservation in their existing states; (2) rehabilitation to serve contemporary uses, consistent with their integrity and character; and (3) restoration to earlier appearances by the removal of later additions and replacement of missing elements.

*5.3.5.1 Archeological Resources.* Archeological resources will be managed in situ, unless the removal of artifacts or physical disturbance is justified by research, consultation, preservation, protection, or interpretive requirements. Preservation treatments will include proactive measures that protect resources from vandalism and looting, and will maintain or improve their condition by limiting damage due to natural and human agents

*5.3.5.2 Cultural Landscapes.* Treatment decisions will be based on a cultural landscape's historical significance over time, existing conditions, and use. Treatment decisions will consider both the natural and built characteristics and features of a landscape, the dynamics inherent in natural processes and continued use, and the concerns of traditionally associated peoples. The treatment implemented will be based on sound preservation practices to enable long-term preservation of a resource's historic features, qualities, and materials. There are three types of treatment for extant cultural landscapes: preservation, rehabilitation, and restoration.

## 3.7.5 Known Resources in the APE

The identification of cultural resources was conducted between 2007 and 2009 by Page & Turnbull and URS Corporation. Identification of resources included archival research and intensive-level field surveys. The findings of these efforts are described below. The findings are divided into the topical subjects of historic structures, archeological resources, and cultural landscapes.

**Historic Structures.** Identification of historic structures included archival research and field surveys completed by Page & Turnbull from 2007 to 2009.

As a result of the archival research completed by Page & Turnbull, seven properties listed in the National Register of Historic Places were identified within the APE (see **Table 3.7-1**). These listed resources are identified in **Figure 3.7-1**. A brief description of each resource is provided below.

**TABLE 3.7-1: PROPERTIES LISTED IN THE NATIONAL REGISTER OF HISTORIC PLACES**

Name		Listing
1	Aquatic Park National Historic Landmark District (#84001183)	National Register-listed (January 26, 1984), National Historic Landmark (May 28, 1987)
2	San Francisco Port of Embarkation U.S. Army National Historic Landmark District (#85002433)	National Historic Landmark (February 4, 1985), National Register-listed
3	Fort Mason National Register Historic District (#72000109); Boundary Increase #79000350	National Register-listed (April 25, 1972); Boundary Increase National Register-listed April 23, 1979
4	California Fruit Cannery Association (Haslett) Warehouse, 680 Beach Street (#75000172)	National Register-listed (March 28, 1975)
5	Pioneer Woolen Mills & D. Ghirardelli Company, 900 North Point Street (#82002249)	National Register-listed (April 29, 1982)
6	San Francisco Cable Cars, 1390 Washington Street (#66000233)3	National Historic Landmark, National Register-listed (October 15, 1966)
7	Pumping Station #2, San Francisco Fire Department Auxiliary Water Supply System (#76000177)	National Register-listed (May 13, 1976)

*Aquatic Park National Historic Landmark District.* The Aquatic Park District is listed as a National Historic Landmark as "...one of California's largest Works Progress Administration (WPA) projects reflecting President Franklin D. Roosevelt's policy of providing employment to architects and artists during the Great Depression." It is significant within the areas of architecture, community planning and development, art, and military, and is particularly noteworthy for its Streamline Moderne architectural style, and its associations with Frederick Law Olmsted and Daniel Hudson Burnham. The Aquatic Park NHL District contains ten acres of land with three building and five structures, which are significant for the period from 1920-1945. The Aquatic Park National Register Historic District was extended to the west side of Van Ness Avenue through concurrence determination of eligibility with SHPO in August 2004, so that the National Register-listed district coincides with the Cultural Landscape. Aquatic Park is located within the San Francisco Maritime National Historical Park.

*San Francisco Port of Embarkation.* The San Francisco Port of Embarkation, U.S. Army Historic District is listed as a National Historic Landmark for its association with World War II in which it was defined as the principal port on the West Coast for delivering personnel, material, weapons, and ammunition to the military campaigns in the Pacific Rim. It is significant within the area of military for the period from 1912 to 1945. It is a discontinuous district, containing 21 acres, 13 buildings, and 5 structures in Lower Fort Mason, and Headquarters building 201 in Upper Fort Mason. The Port of Embarkation NHL District is contained within the Fort Mason National Register Historic District, which is in turn located within the Golden Gate National Recreation Area.

*Fort Mason National Register Historic District.* The Fort Mason Historic District is listed in the National Register of Historic Places for its associations with California military governor Colonel Richard B. Mason (Criterion B) and early Spanish and Western American military history

(Criterion A). This district possesses some of the oldest buildings in San Francisco. Specifically, this district is significant within the areas of military for the specific date of 1797, and the period from 1850 to 1859. Also known as Black Point, Bateria San Jose and Punta Medanos, the historic district was enlarged in 1979. The Fort Mason Historic District (Boundary Increase) is listed in the National Register of Historic Places under Criterion A (Events) and Criterion C (Design/Construction) for its association with early Spanish and Western American military history and as a strong collection of military structures that illustrate the evolution of an Army post from the 1850s to the 1950s. This historic district is significant within the areas of architecture, military, transportation, and landscape architecture for the periods from 1855 to 1953. The historic district encompasses 68.5 acres with 45 buildings, ten structures, and two objects.

*California Fruit Cannery Association (Haslett) Warehouse.* The Haslett Warehouse is listed in the National Register of Historic Places under Criterion A (Events) for its association with the California Fruit Cannery Association, and under Criterion C (Design/Construction) as an example of the warehouses that once dominated the northern waterfront of San Francisco. The building was originally designed by William S. Mooser, Jr., who also completed nearby projects, including D. Ghirardelli Company and the Cannery, and who also worked on the Aquatic Park Bathhouse. It is significant within the areas of architecture, commerce, industry, and urban planning for the period from 1907 to 1909. Recently, the Haslett Warehouse was adaptively rehabilitated and now houses the Argonaut Hotel and the San Francisco Maritime NHP Visitor Center, as well as the NPS Pacific West Information Center.

*Pioneer Woolen Mills & D. Ghirardelli Company.* The Pioneer Woolen Mills & D. Ghirardelli Company is listed in the National Register of Historic Places under Criterion A (Events) for its association with the Pioneer Woolen Mills and D. Ghirardelli Company and under Criterion C (Design/Construction) as the “prototype of commercial adaptive re-use.” Also known as Ghirardelli Square, the complex has three distinct phases of development: Pioneer Woolen Mills (1858-1889) designed by William S. Mooser, Sr., D. Ghirardelli Company (1892-1962-67) designed by William S. Mooser, Jr., and Ghirardelli Square (1962-1982) designed by architects Wurster, Bernardi & Emmons, design consultant John Mattias, and landscape architect Lawrence Halprin. The complex is significant within the areas of architecture, commerce, conservation, industry, landscape architecture, sculpture, adaptive reuse, and urban mall marketplace for the period from 1861 to 1923, and 1962 to 1968.

*San Francisco Cable Cars.* The San Francisco Cable Cars are listed as National Historic Landmarks as the only cable cars still operating in an American city. Designated as a structure, the San Francisco Cable Cars are significant within the area of transportation for the period from 1850 to 1899. In addition to the cars themselves, the designated Landmark includes approximately ten miles of track and cable on eight different streets, the building at Washington and Mason Streets which serves as both the power house and the car-barn, and the turntable mechanisms located at the ends of the various lines of track. There are three extant cable car routes: Powell-Mason, Powell-Hyde, and the California lines. The cable car line running from the Powell/Market turntable to the turntable at the northwest corner of Beach and Hyde streets intersects into a portion of the APE.

*Pumping Station #2.* Pumping Station #2 of the San Francisco Fire Department Auxiliary Water Supply System is listed in the National Register of Historic Places under Criterion C

(Design/Construction) as an example of an innovatively planned and designed “earthquake proof” fire fighting system for San Francisco. Only that portion of the system located on federal land, Pumping Station #2, is included in the nomination. The pumping station is significant within the areas of community planning and engineering for the period from 1912 to 1975.

In addition to the seven historic properties that were previously documented, there were 37 additional buildings and structures within the APE but on city land and outside NPS boundaries that were surveyed for their potential historic significance; none were found eligible for inclusion in the National Register. However, four of the documented buildings were found eligible for the California Register of Historic Resources. A report describing the findings of the historic building inventory was completed by Page & Turnbull in 2009. These potential CRHR resources were also recorded on California Department of Parks and Recreation (DPR) inventory forms; the forms are appended to the 2009 report.

**Archeological Resources.** Identification of archeological resources included archival research and surveys by URS Corporation (URS 2009d) and Holman & Associates (Holman & Associates 2010).

As a result of the archival research, a total of four recorded indigenous archeological resources were identified within the Project APE, including two recorded at least partially within areas that would potentially be affected by ground-disturbing construction activities associated with the historic streetcar line extension. Two of the archeological sites (CA-SFr-30 and CA-SFr-31) are not located within any portion of the APE that would be affected by subsurface disturbances during construction. CA-SFr-23 and CA-SFr-29 are believed to be located at least partially within areas that may be disturbed by Project construction. The exact boundaries of these sites in relation to areas proposed for subsurface disturbance are unknown.

CA-SFr-23 is an indigenous site and was last recorded in 1954. According to the site survey record, the site information is taken from an 1861 publication titled “The Indianology of California” (Davis 1954). The site was described as a “circular fire-burnt spot on the bare place at the summit of a sandy cliff 40’ high, with quantities of decayed fish-bone and crushed shells mixed with sand.” In addition, the 1954 site record also states that the site was destroyed in 1861. It is unclear whether the recorder was able to, or attempted to, relocate the site in 1954 (URS 2009d).

After the results of the record search were analyzed, an intensive pedestrian survey of the Project APE was conducted by URS Corporation (URS 2009d). Despite efforts to locate areas of native soil, ground visibility over the majority of the Project APE was essentially non-existent. In addition, an attempt was made to relocate previously recorded sites within the APE. No evidence of CA-SFr-23 was encountered during the survey effort. In addition, the field survey yielded no new archeological resource discoveries (URS 2009d).

Additional archeological testing for site CA-SFr-23 was not conducted because of the dubious existence of the site based on existing documentation and the amount of historic disturbance and infrastructure changes that have occurred in the reported site location. It was not considered prudent to conduct subsurface testing in this environment.

An additional archeological investigation was completed by Holman & Associates, Archaeological Consultants, on July 27-28, 2010, to document the boundaries of CA-SFR-29, a shell midden that was originally identified in 1978. Site CA-SFR-29 was recorded in the western edge of Fort Mason's Great Meadow, within the APE. The Holman & Associates investigation was completed to determine if the site extended into areas of proposed improvements for the South Loop Alternative. Holman & Associates conducted a limited exploration of 31 auger corings. One auger core in the eastern part of the investigation area revealed a dark brown sandy layer containing fragments of bent nose clam (*Macoma nasuta*) shells, consistent with the original field observations for CA-SFR-29. No archeological deposits were identified within the areas of proposed improvements for the South Loop Alternative (Holman & Associates 2010).

**Cultural Landscapes.** A Cultural Landscape Report (CLR) is the primary report that documents the history, significance and treatment of a cultural landscape. A CLR evaluates the history and integrity of the landscape including any changes to its geographical context, features, materials, and use.

*Cultural Landscape Report, Aquatic Park (NPS 2010b).* The National Park Service has prepared a cultural landscape report (CLR) for Aquatic Park (NPS 2010b). According to the report, "Aquatic Park is a historic designed landscape located on the San Francisco Waterfront, immediately west of Fisherman's Wharf. The park is within the San Francisco Maritime National Historical Park and has a rich association with maritime history, community and park planning, and the Works Progress Administration. For over a century Aquatic Park has been a popular public recreation area and waterfront park.

The designed landscape of Aquatic Park includes historic circulation systems, open spaces, planted areas, and several significant structures including piers, retaining walls, unique outbuildings, and the Streamline Moderne Bathhouse. In 1984, Aquatic Park was listed in the National Register of Historic Places and three years later, in recognition of its national significance, the park was designated a National Historic Landmark (NHL). The period of significance for the historic district is between 1920, when initial construction of the park began, through 1945, marking the end of World War II and military use of the site" (NPS 2010b).

The Aquatic Park CLR includes the entire NHL District, plus a small strip of land on the west side of Van Ness Avenue known as the "Pocket Park." Contributing features to the Aquatic Park cultural landscape relevant to the proposed action include the Bathhouse, the West Bleachers, the West Convenience Station, the West Speaker Tower, the stone retaining wall near the Bocce Ball Courts, the Promenade Retaining Wall, the State Belt Railroad Tracks, and the paved walkway system from Van Ness Avenue past the West Speaker Tower. Non-contributing elements include the Bocce Ball Courts and Victorian Park, both of which were developed after the park's period of significance.

The treatment recommendations detailed in the CLR that are relevant to the proposed action include the following: "Ensure that any future park development affecting the historic character of the stone retaining wall (such as development of historic streetcar tracks and a stop in this area) is considered and evaluated within the context of the historic designed landscape and potential affects [sic] to the NHL district. Assess potential adverse effects of new park development affecting the historic design of

the stone retaining wall, and develop appropriate mitigation measures in consultation with a historical landscape architect and/or cultural resource staff” (NPS 2010b:114-115).

*Cultural Landscape Report for Fort Mason Golden Gate National Recreation Area – Volume One: Site History, Existing Conditions, and Analysis (NPS 2004b)*. Volume One of the Cultural Landscape Report for Fort Mason GGNRA comprises a historical context, an inventory of existing conditions, and an analytical examination of the landscape and its features according to the National Register of Historic Places criteria and definitions. Contributing features to the Fort Mason cultural landscape relevant to the proposed action include the East and West Portals to the tunnel beneath Fort Mason, the tunnel itself, the railroad tracks in the Fort Mason parking lot and within the tunnel, the Lower Fort Mason entry gate and guard station, Piers 1-3 and Sheds 1-3, storehouses A-D, the fire station, and the entire Port of Embarkation cultural landscape. The Great Meadow, created in 1982, is a non-contributing feature of the Fort Mason cultural landscape, although the Specimen Trees located in a landscaped area west of the Great Meadow are contributing natural features.

*Cultural Landscape Report Part II: Treatment. Fort Mason Center (NPS 2009)*. This CLR for Fort Mason Center contains treatment guidelines for the contributory cultural landscape features of the FMC identified in the 2004 study. The treatment guidelines and recommendations are organized by landscape characteristics and range from broad conceptual goals for the site that would follow established planning processes to finely detailed suggestions for improvement.

This CLR contains treatment recommendations that address the proposed extension of the historic streetcar line to Fort Mason, and identifies the opportunities and constraints of both turnaround loop options, expressed as consistencies or inconsistencies with the overall FMC “treatment philosophy,” or guiding preferences. The overall FMC treatment philosophy is identified as *Rehabilitation*, consistent with the Secretary of the Interior’s Standards for Rehabilitation.<sup>3</sup> The report notes that, “Both [turnaround loop] alternatives . . . have aspects that are consistent and inconsistent with treatment philosophy for the FMC landscape” (NPS 2009:90). The report describes the following about the two turnaround loop options:

#### Option A [north turnaround Loop] Consistencies with Treatment Philosophy

- Reintroduces historic rail use through the tunnel and within the boundaries of FMC.
- Intensifies public access, increasing pedestrian activity in Lower Fort Mason and arrival via public transportation.
- Improves the visitor experience.

#### Option A [north turnaround Loop] Inconsistencies with Treatment Philosophy

- Introduces another “access” point to Lower Fort Mason, diminishing one of its significant features as a historic military site – controlled access.

---

<sup>3</sup> The Secretary of the Interior’s Standards define Rehabilitation as “the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.”

- Alters a contributing landscape feature – the retaining wall. The wall would be altered at a point lower than its highest point, which is preferable than at another more focal location.
- May aggravate existing pedestrian and vehicle confusion and orientation near historic entry point.
- As currently designed, the proposed rail tracks do not follow historic patterns, and in some cases interrupt the historic rail track system. If this option is pursued, it is strongly recommended that the alignment of the proposed rail tracks be redesigned, so historic rail circulation routes are left intact and emphasized as having primary significance. Reusing the historic rail alignments should be considered if the track gauges are the same. If not, new track layouts should be designed to minimize the loss of historic rail tracks. New construction such as platforms, waiting areas, and operators' restrooms should be designed following guidelines in this report. Consider accommodating operator's restroom in an existing building rather than constructing dedicated new building.

Option B [south turnaround loop] Consistencies with Treatment Philosophy

- Reintroduces historic rail use through the tunnel.
- Major alterations occur within the Great Meadow, an area much altered in the past.
- Little impact to above-ground historic resources.

Option B [south turnaround loop] Inconsistencies with Treatment Philosophy

- Does not reintroduce historic rail use within the boundaries of FMC.
- Does not result in the same increased foot traffic to FMC.

## 3.8 RECREATION AND VISITOR USE

### 3.8.1 Introduction

San Francisco's northern waterfront is emerging as a key recreational and cultural corridor within the Bay Area. Annually, millions of visitors come to the area's many facilities, including the Ferry Building, tourist attractions at Pier 39, Fisherman's Wharf, San Francisco Maritime National Historical Park (NHP), Municipal Pier, Golden Gate National Recreation Area's (GGNRA) headquarters, and Fort Mason, where the Fort Mason Center is located. Of these recreational opportunities, only those located on the proposed route are expected to be affected and are discussed below.

### 3.8.2 Key Recreational Opportunities in Project Area

**Fisherman's Wharf.** Fisherman's Wharf describes a tourist district in San Francisco, roughly encompassing the northern waterfront from Van Ness Avenue east, to Pier 35 or Kearny Street. Several historic public transportation lines service the area including the F Market streetcar, the Powell-Hyde cable car line, and the Powell-Mason cable car line. It is best known for being the location of Pier 39, San Francisco Maritime National Historical Park, the Cannery Shopping Center, Ghirardelli Square, a Ripley's Believe it or Not museum, the Musée Mécanique, the Wax Museum at Fisherman's Wharf, Forbes Island, and restaurants and stands that serve fresh seafood. Other attractions in the Fisherman's Wharf area are the Hyde Street Pier, the USS Pampanito, a decommissioned World War II era submarine, and the Balclutha, a 19th century whaling ship. Some of these attractions are discussed in greater detail below.

**Fort Mason.** Fort Mason is a formal military post and port of embarkation, in use until the 1960s. Fort Mason consists of Upper and Lower Fort Mason. Upper Fort Mason is at a higher elevation, and includes the Great Meadow and the headquarters of the GGNRA. Lower Fort Mason houses the administrative offices of SF Maritime NHP, including the headquarters offices, library and collections and the Fort Mason Center. By 1972, Fort Mason, along with other Bay Area military outposts, became the GGNRA, an urban park within the National Park Service system. Upper Fort Mason now hosts a youth hostel, hiking and biking trails, open space parks and gardens, beaches, a cultural center and historic buildings. The largest open space area within Fort Mason is the Great Meadow, which is a popular spot to sit on the grass, walk, or fly kites, among other recreational opportunities. A path follows the harbor edge, rising along the headland and offering views north past Alcatraz and east to the Golden Gate Bridge. Fort Mason Center (lower Fort Mason), is devoted to events, programs and organizations that support and reflect the culture of San Francisco.

**The San Francisco Maritime National Historical Park.** This park was acquired in 1978 and includes a fleet of historic vessels, a visitor center, man-made lagoon, parks, a maritime museum, and a library/research facility, among other things.

*The San Francisco Maritime Museum* is a Streamline Moderne (late Art Deco) building that is the key structure of the Aquatic Park National Historic Landmark District. It is a four-story reinforced concrete structure designed by William Mooser, Senior and Junior. It is oval in plan, and its clean

nautical lines and stepped levels evoke images of a ship. A Works Progress Administration (WPA) report stated: 'like a huge ship at its dock. . .with rounded ends, set back upper stories, porthole windows and ship rails, its resemblance to a luxurious ocean liner is indeed startling.' Built as a bathhouse for 5,000 people, 'a Palace for the Public' in the mid- to late-1930s, its interior is decorated with fantastic and colorful murals (WPA fact sheet). The second, third, and fourth floors are used for exhibit space.

North of the Maritime Museum is a man-made lagoon on the site of the former Black Point Cove used for swimming and boating. To the west is the horseshoe shaped Municipal Pier. The lagoon is fronted by a sandy beach and a stepped concrete seawall. To the south is a grassy area known as Victorian Park which contains the Hyde Street cable car turnaround. This park is used for sitting, sunbathing, picnicking, enjoying the water views, lawn games, dog exercising, and school groups. Nearby, there are Bocce Ball Courts at Beach Street and Van Ness Avenue. Formerly the site of the Black Point Pumping Station, this vacant lot was informally used as a gathering area for local bocce ball players as early as 1947. In 1960, the City of San Francisco constructed courts, wood retaining wall, overhead structure and a raised planting bed and in 1994 the roof on the overhead structure was replaced and a planting bed along the east side of the courts was added (NPS 2010b). Today there is space for five courts; two of which are under a protective roof. The three uncovered courts are used for the original form of bocce, played with bronze balls. There is also a clubhouse that is used to store bocce balls and other equipment. There are approximately 50 members of the private Aquatic Park Bocce Ball Club; however the courts are open to the public. The courts are used almost daily by approximately 2-50 people. The courts are used by summer camps, the Special Olympics, and a variety of other tournaments (Tosi 2010).

The Hyde Street Pier is an historic ferry pier and creates the eastern boundary of the lagoon. Various historical ships are anchored to the pier, some available for self-guided or docent-led tours. Among the ships on display or in storage are the *Balclutha*, an 1886 square rigged sailing ship, as well as *C.A. Thayer* NHL, *Eureka* NHL, *Alma* NHL, *Hercules* NHL, *Epplenton Hall*, and several smaller craft.

The park also incorporates the Aquatic Park Historic District NHL, bounded by Van Ness Avenue, Beach Street, and Hyde Street. This district is a complex of buildings within a designated landscape on the San Francisco Bay waterfront. The District includes the bathhouse and stadia, Municipal Pier, two speaker towers, two convenience stations, one with a concessions stand (now used as storage), sea wall, promenade, the beach, the lagoon, paths, retaining walls and historic plantings.

The grassy areas of Aquatic Park are used for sitting, sunbathing, picnicking, and enjoying the water views. Ghirardelli Square is located at 900 North Point Street at the corner of Beach and Larkin Streets, one block west of the Cable Car turnaround at Beach and Hyde streets. Ghirardelli Square was the historic headquarters of the Ghirardelli Chocolate Company, but after the company was sold and moved off site, the buildings were purchased and converted into a center for shops and restaurants. Since this time, the area has become a landmark and attraction for locals and tourists. In 1982, a portion of the area was listed on the National Register of Historic Places.

The San Francisco Bay Trail is a planned recreational corridor to ring the San Francisco and San Pablo bays with a 500-mile network of bicycling and hiking trails. The Bay Trail Plan was adopted by the

Association of Bay Area Governments (ABAG) in 1989, and to date, 290 miles of the trail have been completed. The Bay Trail provides easily accessible recreational opportunities for outdoor enthusiasts, including hikers, joggers, bicyclists, and skaters. It also offers a setting for wildlife viewing and environmental education, and it increases public appreciation for the Bay.

A portion of this trail is contained within the Project Area, as is shown in Figures 1-2 and 1-3. From east to west, the Bay Trail follows Jefferson Street until it ends at Hyde Street. The trail then follows a path along the northern edge of Victorian Park and joins with the path along the water's edge at Black Point Cove. Near the western speaker tower in the San Francisco Maritime NHP, the trail veers southwest from the water's edge along the old railroad tracks and joins with northern Van Ness Avenue. Before the Municipal Pier, the Bay Trail heads west along the coast line and merges into the northern-most trail of the Great Meadow along the bluff. At Laguna Street, the trail follows the sidewalk north for a short distance, crosses the Fort Mason parking lot, and follows the paved pathway west, adjacent to the yacht club.

### **3.8.3 Visitor Use in the Project Area**

The average recreational visitors to the Fort Mason area appear to be a mix of San Franciscans and local Bay Area residents, with a smaller subset of visitors from other areas including international tourists. The Fort Mason Intercept Survey was conducted for three days in August of 2007. Seventy percent of respondents identified themselves as Bay Area residents. When asked to report their residential zip code, the majority of surveyed users reported a zip code in San Francisco. Others reported Daly City, Pacifica, cities within Marin County, San Mateo, Berkeley, and Oakland with a measurable frequency. During the survey 9,593 persons were encountered entering the Fort Mason Center. Over half of all users to the center walked as their primary mode of access. The automobile was the second most heavily used access mode, used by nearly 39 percent of the total users. Bike and other modes formed the remaining 3.5 percent of access. Nearly a third of all respondents were at Fort Mason to attend a one-time event, 18 percent were attending a class at Fort Mason Center and 13 percent were there to dine (Wilbur Smith 2007b).

As described in Chapter 1. Purpose and Need for Action, the Fort Mason Center is a destination for many visitors to the GGNRA. The Center hosted more than 11,400<sup>1</sup> events in fiscal year 2009 (October 2008-September 2009), bringing approximately 1.7 million visitors to the site (FMC 2009a). Many events at Fort Mason Center are attended by thousands of visitors, with the largest single event attended by 8,000 visitors (see Appendix A1) for a complete list of the major events in 2010). Other events in the area that impact the Fort Mason Center such as the Bridge to Bridge Run bring over 10,000 visitors to the area.

---

<sup>1</sup> Events include classes, meetings, conferences, exhibitions and performances; many occur simultaneously each day.

### 3.8.4 Regulations and Policies

#### Federal Guidelines

United States Department of Transportation (USDOT) Act of 1966 – set forth in Title 49 United States Code (U.S.C.), Section 303 provides protection to certain publicly used lands and historic sites. Under Section 4(f) of this code, the USDOT shall not approve a program or project which requires the use of any publicly owned public park, recreation area, or wildlife or waterfowl refuge, or a site of any land from an historic site of national, state, or local significant unless:

- There is no feasible and prudent alternative to the use, and
- All possible planning to minimize harm resulting from such use is included.

A specific Section 4(f) evaluation is not being developed at this time; however this document contains all elements necessary to produce a Section 4(f) evaluation by the Federal Transit Administration, under USDOT, if future funding and/or responsibilities requires such an action, for the project.

#### 2006 National Park Service Management Policies

*Visitor Use.* Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks. The Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks, and the Service will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of American society. However, many forms of recreation enjoyed by the public do not require a national park setting and are more appropriate to other venues. The Service will therefore:

- Provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks;
- Defer to local, state, tribal, and other federal agencies; private industry; and nongovernmental organizations to meet the broader spectrum of recreational needs and demands

*Recreation.* The range of recreational activities that take place in parks include, but are not limited to boating, camping, bicycling, fishing, hiking, horseback riding and packing, outdoors sports, picnicking, swimming, etc. . . . Many of these activities support the federal policy of promoting the health and personal fitness of the general public, as set forth in Executive Order 13266. However, not all of these activities will be appropriate or allowable in all parks; that determination must be made on the basis of park-specific planning.

#### Local Guidelines

**City of San Francisco General Plan (1996) – Recreation and Open Space Element.** The Recreation and Open Space Element concerns the conservation and preservation of opens space, parks and recreational areas within San Francisco. The following policies are applicable to the proposed project.

- **Policy 1.3** – Increase the accessibility of regional parks by locating new parks near population centers, establishing low user costs, improving public transit service to parks and creating regional bike and hiking trails.
- **Policy 2.2** – Preserve existing public open space.

**Northwestern Shoreline Plan (1992).** The Northwestern Shoreline plan concerns the preservation and enhancement of San Francisco’s Northwestern Shoreline from Lincoln Park to Fort Mason. The following objective applies to the proposed project.

*Fort Mason (GGNRA).* Protect natural vegetation and marine wildlife habitat at the northeast portion of the site. Maintain the existing cultural center in renovated pier and warehouse structures, and use for educational and cultural facilities and activities. Encourage continued programming of special events and activities. Introduce landscaping in parking area. Develop the Burton Memorial amphitheater. Preserve historic gardens and adapt historic buildings to community uses as current use is discontinued and structures are made available by the U.S. Army.

**Northeastern Waterfront Plan (1998).** The Northeastern Waterfront Plan recommends objectives and policies designed to contribute to the waterfront’s environmental quality, enhance the economic vitality of the Port and the City, preserve the unique maritime character, and provide for the maximum feasible visual and physical access to and along the Bay.<sup>2</sup> Within the project area, everything east of the boundary of San Francisco Maritime National Historical Park (Hyde Street) falls within the jurisdiction of the Northeastern Waterfront Plan. The following policy is applicable to the project study area.

- **Policy 7.3** – Connect the recreation and open space facilities of the Northeastern Waterfront with those of the Golden Gate National Recreation Area.<sup>3</sup>

**Van Ness Avenue Plan (1995).** The Van Ness Avenue Plan provides guidance and direction on physical arrangement of development along the Van Ness corridor. The Van Ness Area Plan was adopted in 1995. Of the three sub-areas identified along the Van Ness corridor, Sub-area 3, which encompasses the portion of Van Ness Avenue between Bay Street and Beach Street, pertains to the study area. The following policy is applicable to the project study area.

- **Policy 3.2** – Support National Park Service plans for improvements of the area within the boundaries of the Golden Gate National Recreation Area (GGNRA).<sup>4</sup>

The study area includes parks and recreational areas and facilities as presented in **Table 3.8-1**. A description of the parks and associated facilities is provided after the table.

---

<sup>2</sup> San Francisco Northeastern Waterfront Plan, Adopted 1998.

<sup>3</sup> For the purposes of the Northeastern Waterfront Plan, Policy 7.3 actually refers to connecting the facilities of the Northeastern Waterfront with those of the San Francisco Maritime National Historical Park (Aquatic Park), not the GGNRA.

<sup>4</sup> For the purposes of the Northeastern Waterfront Plan, Policy 3.2 actually refers to improvements within the boundaries of San Francisco Maritime National Historical Park.

**TABLE 3.8-1: DESCRIPTION OF PARKS AND RECREATIONAL FACILITIES IN AND NEAR THE STUDY AREA**

Facility	Address	Jurisdiction	Activity
<b>Facility Within the Study Area</b>			
Fort Mason Center at Golden Gate National Recreation Area	Laguna/Beach	National Park Service	This area includes the following facilities and services: community gardens, picnic areas, fitness areas, grassy fields, visitor's center, fishing piers, youth hostel, theater, café, exhibits, fairs, lectures, festivals, performances, symposia, classes, and workshops.
San Francisco Maritime NHP	Van Ness/Beach	National Park Service	This area includes the following facilities and services: piers, historic vessels, beach, museum, library, visitor's center, park, tours, musical, lectures, classes, demonstrations, bocce ball courts, national landmarks, and picnic areas.
Joseph Conrad Mini Park	Leavenworth/Beach	SF Recreation & Park Dept.	This area provides benches and open space.  This area consists of 343 boat slips and park land which includes a restroom, and two parking lots.
Marina Green Park	Marina/Fillmore	SF Recreation & Park Dept.	
East Harbor	Marina/Webster	SF Recreation & Park Dept.	
<b>Facilities Near the Study Area</b>			
George R. Moscone Recreation Center	Top of Form 1800 Chestnut St. Bottom of Form	SF Recreation & Park Dept.	This area includes four baseball diamonds, four tennis courts, two basketball court areas, a gymnasium, two putting greens, and a playground.
Russian Hill Park	Bay/Hyde	SFPUC-Water Dept.	This area provides benches and open space.

**3.8.5 Parklands in the Study Area**

**Fort Mason Center at the Golden Gate National Recreation Area.** The Golden Gate National Recreation Area (GGNRA) is composed of over 75,500 acres encompassing portions of San Francisco, Marin, and San Mateo Counties. The GGNRA is under the jurisdiction of the National Park Service (NPS) and includes residential, commercial, and recreational uses. Fort Mason, which is one of the components of the GGNRA, comprises 63 acres located within the City of San Francisco along Bay Street, between Laguna Street and Van Ness Avenue. Fort Mason is divided into two areas, Fort Mason Center, also known as Lower Fort Mason, and Upper Fort Mason. Fort Mason Center is

administered by the Fort Mason Foundation and is composed of nine buildings with 300,000 square feet of space. The Center provides various facilities and activities such as fishing piers, theater, café, exhibits, fairs, lectures, festivals, performances, symposia, classes, and workshops. Upper Fort Mason is composed of 34 buildings, which are utilized for various purposes and activities such as residences, a youth hostel, a visitor's center, and other private activities. The recreational area within Upper Fort Mason provides community gardens, picnic areas, fitness areas, and grassy fields.

**San Francisco Maritime National Historical Park.** The San Francisco Maritime NHP, established in 1988 as a separate National Park, contains 50-acres located along Beach Street, between Van Ness Avenue and Hyde Street in San Francisco, abutting the GGNRA at the foot of Van Ness. The park, which is under the jurisdiction of the NPS, contains the following facilities: the Hyde Street Pier, eight historic vessels, six of which are National Historic Landmarks, a collection of historic small craft, the Aquatic Park National Historic Landmark District, the Maritime Museum and the San Francisco Senior Center within the Aquatic Park Bathhouse Building, Victorian Park, the Sea Scout Base, the Tubbs Cordage Building, the Argonaut Hotel and park Visitor Center located in the historic Haslett Warehouse, the J. Porter Shaw Maritime Library, and a museum collection of over 5 million artifacts and historic documents. The park offers tours, classes, lectures, events, recreation, education, and interpretation for all ages. The grassy areas serve as a backyard for the many people who live in the neighborhood.

The San Francisco Maritime NHP is currently rehabilitating the Aquatic Park district's Bathhouse/Amphitheatre with two major construction projects, and the district's first Cultural Landscape Report (CLR) has been completed. The CLR's findings/recommendations will guide future use and landscaping of the district. Planning is also underway for rehabilitation of the San Francisco Maritime NHP's historic maritime heritage and learning center (Sea Scout Base) and the district's recreational pier (Municipal Pier), both in western Aquatic Park.

**Joseph Conrad Mini Park.** This small 0.07-acre, triangular-shaped mini park, which is under the jurisdiction of San Francisco Department of Recreation and Parks and is located along Leavenworth and Beach Streets and provides the community with a landscaped open space.

**Marina Green Park.** The Marina Green Park contains approximately 77 acres of wide grassy fields, which is under the jurisdiction of San Francisco Department of Recreation and Parks. The park is located along Marina Boulevard between Lyon and Laguna Streets and is adjacent to Fort Mason and the San Francisco Marina Yacht Harbor.

**East Harbor.** The East Harbor is part of the San Francisco Marina Yacht Harbor. This harbor, which is under the jurisdiction of San Francisco Department of Recreation and Parks, is located along Marina Boulevard at Webster Street, adjacent to Fort Mason. The East Harbor, also known as Gashouse Cove, consists of 343 boat slips and park land which includes a restroom, and two parking lots.

### **3.8.6 Parkland Resources Outside the Study Area**

**George R. Moscone Recreation Center.** The George R. Moscone Recreation Center is surrounded by commercial and residential uses, and is bordered by Laguna, Bay, Fillmore, and Chestnut Streets. The Center is under the jurisdiction of the San Francisco Recreation and Park Department and

## AFFECTED ENVIRONMENT

includes four baseball diamonds, four tennis courts, two basketball court areas, a gymnasium, two putting greens, and a playground. The Moscone Recreation Center Gymnasium was recently renovated to create additional multi-purpose recreation rooms.

**Russian Hill Park.** This small park is located on Bay Street between Larkin and Hyde. This grassy park with trees, plantings, and benches is operated by the San Francisco Public Utilities Commission – Water Department.

## **3.9 VISUAL AND AESTHETIC RESOURCES**

### **3.9.1 Introduction**

The visual environment in the study area is described below to establish a baseline for comparing visual and aesthetic changes resulting from the construction and operation of the Historic Streetcar Extension Project. The visual character of the study area reflects the built-up features of San Francisco's urban landscape surrounding acres of open space, including parklands and shorelines owned and operated by the National Park Service and the City of San Francisco. Sweeping views of the Bay, Alcatraz, Marin County, and Golden Gate Bridge are ever-present and constitute the spectacular nature of viewsheds cherished by residents and visitors of this part of San Francisco. Because the long views and perspectives are as important as the visual character of the buildings, streets, and park features, descriptions of both foreground and background views are provided on a street-by-street basis, particularly in locations where changes to the landscape are most likely to occur from project implementation. Photographs of the existing landscape accompany the text (in Section 4.9) to enhance the reader's understanding of the area's visual qualities and to demonstrate a before and after visual simulation of particular viewpoints.

### **3.9.2 Historic Viewsheds**

**Golden Gate National Recreation Area (GGNRA).** The urban setting of the GGNRA is incorporated into the existing views and vistas of the landscape of Fort Mason. The San Francisco Bay, the city of San Francisco, and the Golden Gate Bridge are all prominent features of the visual relationship between Upper Fort Mason and its surroundings. The Cultural Landscape Report (CLR) for Fort Mason: Golden Gate National Recreation Area (2004) describes how the once panoramic views of the bay are now blocked by dense vegetation. The CLR identifies important viewsheds from Upper Fort Mason including a view to the Golden Gate Bridge from Great Meadow, a view to the Palace of Fine Arts, a view to the Flagpole at the entrance of upper Fort Mason, as well as views to Alcatraz and Black Point Cove.

**SF Maritime National Historical Park (NHP).** While the SF Maritime NHP Cultural Landscape Report does not identify specific viewsheds within and from the National Historic Landmark (NHL) District, it stresses the importance of preserving visual compatibility with the elements of the NHL District. Building utilities and associated infrastructure such as water lines and electrical panels should be located in a manner that reduces visual impacts and potential adverse affects to the historic designed landscape (NPS 2010b).

In general, visual sensitivity is higher for views seen by people who are driving for pleasure or engaged in recreational activities such as hiking, walking, biking; and homeowners or renters. Sensitivity tends to be lower for views seen by people driving to and from work or as part of their work. Commuters and nonrecreational travelers tend to have momentary views and tend to be focused on traffic and not on surrounding scenery. Residential viewers typically have extended viewing periods and are concerned about changes in the views from their homes and are therefore considered to have moderate to high visual sensitivity. Viewers using recreational trails and walkways typically have high visual sensitivity as well.

### 3.9.3 Regulations and Policies

**National Park Service General Management Plan Documents.** For National Park Service resources in the study area, the Golden Gate National Recreation Area General Management Plan (1980) identifies maintaining the visual integrity of parkland facilities as an important factor in the placement and design of all new park facilities. In addition, the General Management Plan of the San Francisco Maritime National Historical Park (1997) includes an objective to design high-quality facilities that exemplify visual consistency.

#### 2006 National Park Service Management Policies

*9.1.1.2 Integration of Facilities into Park Environment.* When the determination has been made through a planning process that it is appropriate for a facility to be constructed within park boundaries, all facilities will be integrated into the park landscape and environs with sustainable designs and systems to minimize environmental impact. The full integration of facilities into the park environment will involve:

- Sensitivity to cultural, regional aesthetic and environmental factors...in the selection of site, construction materials, and forms.

*9.1.5.3 Utility Lines.* Where feasible, NPS utility lines will be placed underground, except where such placement would cause significant damage to natural or cultural resources (such as historic structures or cultural landscapes). When placed aboveground, utility lines and appurtenant structures will be located and designed to minimize their impact on park resources and values. Whenever possible and visually acceptable, all utilities will share a common corridor and be combined with transportation corridors. Cost-effectiveness, reliability of service, and visual impact will be considered when deciding whether to install utility lines aboveground or underground.

*9.2.3 Traffic Signs and Markings.* Signs will be limited to the minimum necessary to meet information, warning, and regulatory needs and to avoid confusion and visual intrusion.

*9.1.3.1 Construction Sites.* Visual intrusions will be kept to a minimum.

**San Francisco General Plan – Transportation Element.** San Francisco has adopted General Plan and Specific Plan guidelines that encourage the preservation of views and enhance the visual, aesthetic, and historic elements of the urban landscape. Relevant policies that pertain to the study area are listed below.

- **Policy 2.3** – Design and locate facilities to preserve the historic city fabric and the natural landscape, and to protect views.

Care must be taken to ensure that street and transit improvements are made to enhance the beauty and delicate fabric of the city and to protect views of the city, the bay, the ocean and the hills.

- **Policy 2.4** – Organize the transportation system to reinforce community identity, improve linkages among interrelated activities and provide focus for community activities.

The manner in which the transportation system is organized may contribute to or undermine social and environmental stability. Through traffic routes should not split neighborhoods or pose insurmountable barriers to movement among them. Street design and location of automobile and bicycle parking should contribute to the establishment of pedestrian-oriented neighborhood centers where residents may congregate.

- **Policy 24.1** – Preserve existing historic features such as streetlights and encourage the incorporation of such historic elements in all future streetscape projects.

Historic streetlight removal is an ongoing problem in the city as the responsible departments argue that historic streetlights are not worth the expense. Given San Francisco's historic architectural heritage, we should be protecting more historic elements, not removing them.

- **Policy 24.2** – Maintain and expand the planting of street trees and the infrastructure to support them.

Street trees are one of the most important elements in creating a livable streetscape. They provide shade, create a human scale on the street, soften the edge between the building and the street, and serve as a buffer between pedestrian space and the street. Moreover, street trees are an important environmental consideration as they contribute to cleaner air. An appropriate program of irrigation and maintenance should be implemented with street tree planting.

#### **Van Ness Corridor Plan–Transportation and Circulation Element.**

- **Policy 9.2** – Provide clearly visible and readable street signs and bus stop signs to improve the legibility of bus stops for riders within the bus and for pedestrians. Such signage, however, should not overwhelm the design of the landscape/streetscape system. Provide safe and comfortable waiting areas for patrons by using well-directed street lighting and bus shelters.

**San Francisco 49-mile Scenic Drive.** The San Francisco 49 mile Scenic Drive is located within the project limits; a sign designating the route is located on Polk Street. According to the San Francisco Planning Department (personal communication Joshua Switzky, January 23, 2009) there are no defined visual quality objectives or requirements or city policies related to the drive.

### **3.9.4 Important Viewsheds**

Views of the study area and from within the study area are discussed to establish the visual character and aesthetic quality of the study area and surrounding region from key viewing locations.

The criteria for identifying the importance of views are related in part to the position of the viewer relative to the resource. An area of the landscape that is visible from a particular location (e.g., an overlook) or series of points (e.g., a road or trail) is defined as a *viewshed*. To identify the importance of views of a resource, a viewshed may be broken into distance zones of foreground, middleground, and background. Generally, the closer a resource is to the viewer, the more dominant it is and the greater its importance to the viewer. Although distance zones in viewsheds may vary between different geographic regions or types of terrain, a commonly used set of criteria identifies the *foreground* zone as 0.25–0.5 mile from the viewer, the *middleground* zone as extending from the foreground zone to

3-5 miles from the viewer, and the *background* zone as extending from the middleground zone to infinity (U.S. Forest Service 1974). The following vantage points were used for the analysis of visual resources. Photos described below can be found in Section 4-9.

### **Turnaround Segment**

*Marina Boulevard near Laguna Street looking east (close-in view of North Loop).* The foreground view from the eastern approach along Marina Boulevard in front of the Safeway parking lot is a street-level view of the approach towards the western edge of the Great Meadow and the Fort Mason Center security gate. The west-bound outlet of the Fort Mason Tunnel is also depicted in the middle of the background of this view. The southern edge of the North Loop turnaround would be visible from this vantage point.

*Marina Boulevard near Laguna Street looking east (close-in view of South Loop).* The foreground view from the eastern approach along Marina Boulevard in front of the Safeway parking lot is a street-level view of the approach towards the western edge of the Great Meadow and the Fort Mason Center security gate. The west-bound outlet of the Fort Mason Tunnel is also depicted in the middle of the background of this view. The western edge of the South Loop turnaround would be visible from this vantage point.

*Marina Boulevard at Laguna Street looking northeast.* Views of the San Francisco Port of Embarkation (Fort Mason) National Historic Landmark District (NHLD) dominate the middle and background of this view. The Fort Mason Center parking lot and security entrance gate are in the left side of the frame. The retaining wall and Fort Mason tunnel outlet are in the right side of the vantage point background. A sidewalk lines the curve in the road where Laguna Street meets Marina Boulevard.

*Fort Mason Building C stairway looking south.* This view captures the Fort Mason Center parking lot and Building A in the foreground and middle ground. The retaining wall along the Fort Mason Tunnel outlet is in the background as is the Fort Mason Center entrance and gatehouse and the edge of Great Meadow. This is the location of the proposed North Loop turnaround. Visual resources in this view include the Building A of the San Francisco Port of Embarkation (Fort Mason) NHLD.

*Laguna Street at North Point Street looking north.* The western edge of the Great Meadow occupies the foreground and middleground of this vantage point. Great Meadow is dominated by grassy slopes, trees and a pedestrian path. The street is lit with two streetlamps along this stretch of Laguna Street.

*Fort Mason path looking northeast.* Within the Great Meadow, views of the Golden Gate Bridge, the San Francisco Bay and the Marin Headlands are visible from pedestrians and bicyclists. This view depicts the western edge of the Great Meadow where the South Loop of the Turnaround would be constructed. The view of the Golden Gate Bridge is also an important viewshed identified in the GGNRA Fort Mason Cultural Landscape Report.

### Transition Segment

*Beach Street near Polk Street looking northwest.* This view captures the western edge of the Maritime Museum in the foreground of the right side of the photo and a portion of the Bocce Court in the left side of the photo in the middleground. The West Speaker Tower peaks up from the surrounding trees in the background. A walkway leads from the front of the Maritime Museum to the promenade at Aquatic Park.

*Van Ness Avenue looking south.* Visual resources from this vantage point include the Aquatic Park NHLD. Contributing features to the NHLD includes the Maritime Museum, West Speaker Tower, the State Belt Railroad Tracks, and the paved walkway system from Van Ness Avenue past the West Speaker Tower. Ghirardelli Square is in the background.

### In-Street Segment

*Polk Street at Beach Street looking north.* The Maritime Museum is the focal point of this view at the intersection of Polk Street and Beach Street. There is a pedestrian walkway in front of the Museum and three crosswalks at this intersection allow pedestrians to directly access the Museum entrance from the opposite side of the street.

*Beach Street near Hyde Street looking east.* This view shows the two-lane east-bound and one-lane west-bound street in the foreground. Parking spaces line both sides of the street. Street vendors occupy the north-side of the street on the sidewalk in the middleground. Victorian Park is not visible in this view, but it is located adjacent to the north sidewalk behind the street vendors. The Cable Car NHLD turnaround is at the Hyde Street intersection within Victorian Park in the background. Streetlamps are positioned at the corner of Hyde Street.

This page intentionally left blank

## **3.10 NIGHT SKY VISIBILITY AND LIGHT POLLUTION**

### **3.10.1 Introduction**

The discussion below describes the current night lighting setting in the project area in order to contrast the visibility and light pollution changes caused by the project. This section also identifies vantage points with visual clearance of the project area which may be sensitive receptors to changes in nighttime lighting levels.

In accordance with NPS Management Policies 2006, the NPS strives to preserve natural ambient lightscapes, which are natural resources that exist in the absence of human-caused light. Due to the highly urbanized setting in the project area, the preservation of a natural ambient lightscape is not an objective for the Project. However, the Project's goals should be to avoid degrading the existing night time visibility or causing intrusive light pollution to the local community.

### **3.10.2 Existing Conditions**

**Regional Setting.** The project area is set in a highly urbanized and densely populated region. San Francisco and the northern waterfront, in particular, have some of the highest population levels and urbanization in the San Francisco Bay Area. With cities come extensive networks of outdoor lighting to illuminate streets, sidewalks and public spaces. Nighttime lumination of the Bay Area and San Francisco is well known through night time skyline photos taken by commercial and private photographers.

**Vicinity Setting.** Sources of light and glare are abundant in the northern waterfront area of San Francisco. Nighttime lighting in this highly urban environment is dominated by the presence of extensive street, parking lot lighting, security lighting, public lighting, vehicular headlights, the illuminated Ghirardelli sign above Ghirardelli Square, and well-lit shops and restaurants of the popular fisherman's wharf tourist area. The parking lot of the Fort Mason Center is well lit during evening hours. Most of these lighting sources are in use from sunset to sunrise. As is characteristic of highly urbanized areas, the glare of artificial outdoor and indoor lighting has nearly completely obscured the stars and other astronomical phenomenon in the night sky. The open spaces of the meadows and gardens of Fort Mason and the SF Maritime NHP provide a visual break from the city lights. In particular the Great Meadow is quite dark relative to the surrounding urban lightscape.

### **3.10.3 Viewer Groups and Viewer Responses**

Viewer groups in the vicinity of the project area and their sensitivity to light level changes in the area are characterized below.

**Residents.** Few districts within San Francisco are exclusively commercial; most are a mix of residential and commercial uses. The northern waterfront is no exception to this rule and hosts a permanent community of residents living in the Fisherman's Wharf area. Views of the proposed transit route extension alternatives vary based on the viewer's location in the community. Some views are limited to

the immediate foreground because they are obstructed by the built environment. Others may have a direct line of vision from one or more vistas in their dwelling.

Residents on any proposed extension of the transit route are considered moderately sensitive to nighttime visual changes within project area. Residents who live within 200 feet of a proposed transit stop are considered to have high sensitivity to nighttime visual changes in the project area.

**Recreational Users.** Recreational users of surrounding areas, including Golden Gate National Recreation Area, SF Maritime NHP, Fort Mason, and other nearby tourist areas, would have regular views of the project area; however, because tourist activity in these areas generally occur during daylight hours, nighttime visibility is only an occasion concern. For this viewer group, nighttime visibility concerns would largely be centered on safety needs. Recreational users of the northern waterfront are considered to have a low sensitivity to nighttime visual changes in the project area.

### 3.10.4 Regulations and Policies

#### 2006 National Park Service Management Policies

*Lightscape Management.* In accordance with *NPS Management Policies 2006*, the National Park Service strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human-caused light. The night sky that is visible during clear nights influence humans and other species of animals, such as birds that navigate by the stars or prey animals that reduce their activities during moonlit nights. Improper outdoor lighting can impede the view and visitor enjoyment of a natural dark night sky. Recognizing the roles that light and dark periods and darkness play in natural resource processes and the evolution of species, the National Park Service will protect natural darkness and other components of the natural lightscape in parks. To prevent the loss of dark conditions and of natural night skies, the Service will minimize light that emanates from park facilities.

The Service will:

- restrict the use of artificial lighting in parks to those areas where security, basic human safety, and specific cultural resource requirements must be met;
- use minimal-impact lighting techniques;
- shield the use of artificial lighting.

## 3.11 GEOLOGY, SOILS AND SEISMICITY

### 3.11.1 Introduction

This section presents the existing geologic conditions in the region of the F-Line Extension Project, including geology, soils, and seismic hazards. In this discussion, the project study area is referenced in terms of the eastern and western portions because the characteristics of the geology and soils within each portion is similar, however, the eastern and western portions of the project study area are distinct enough to warrant separate discussions. The eastern portion encompasses the study area between Mason and Van Ness Streets. The western portion encompasses the study area between the eastern edge of Fort Mason at Van Ness and Fillmore Street.

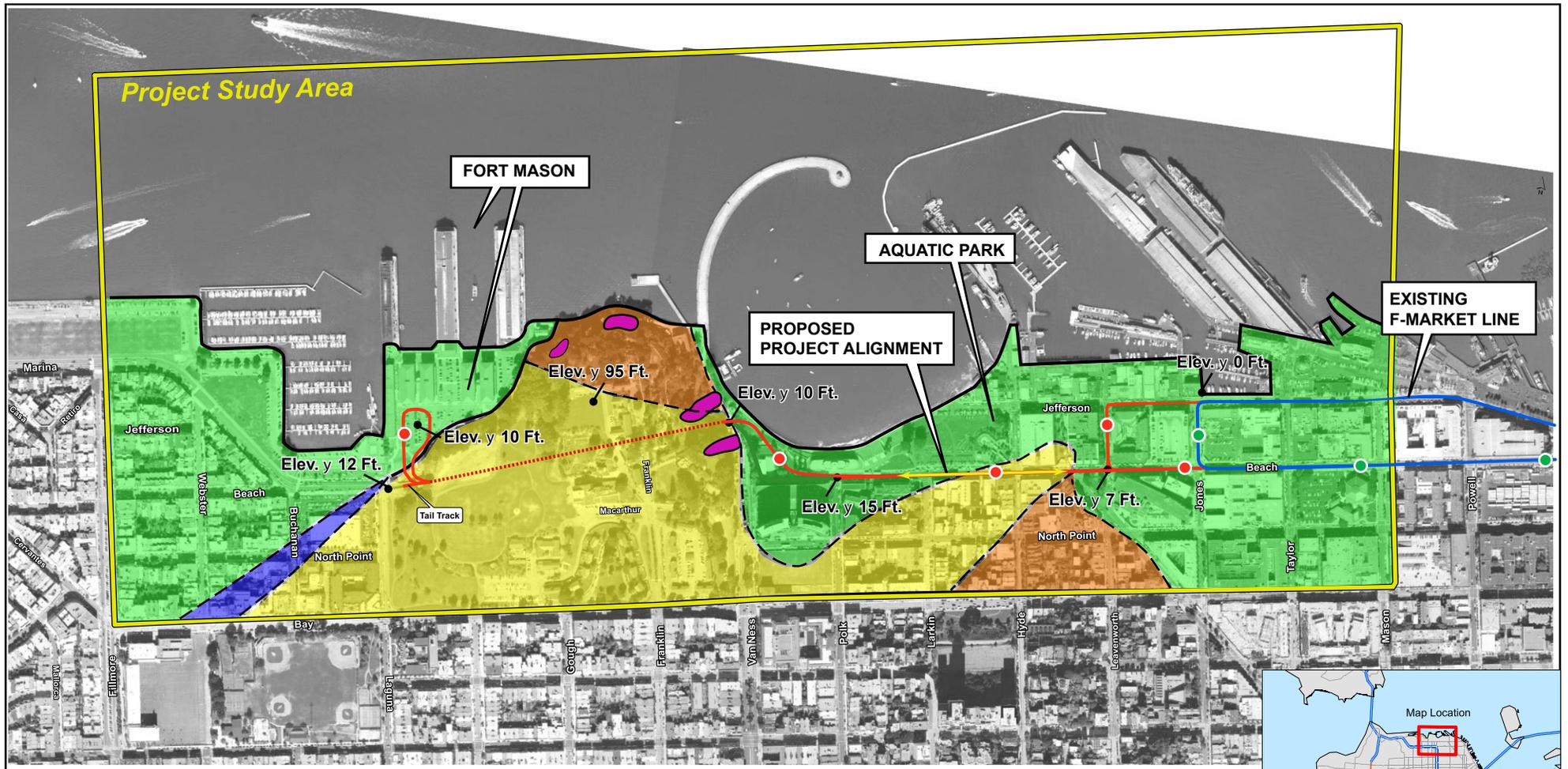
### 3.11.2 Environmental Setting

**Regional Geology.** The Project site is located at the northern end of the San Francisco Peninsula within the northern Coast Ranges physiographic province. This province is characterized by a north-northwest-trending series of mountains and intervening valleys that extend from the Oregon border south to the Transverse Ranges of Southern California. The ridge and valley character of the Coast Ranges province is predominantly controlled by the structural grain of the underlying geological units and long-term erosional processes. The project area is on the northern end of the San Francisco Peninsula, adjacent to the San Francisco Bay, which is thought to have formed by a down-warping of the earth's crust between the seismically active Hayward and San Andreas faults.

**Site Geology.** In the eastern portion of the study area, between Jones and Leavenworth, the Project alignment runs through areas mapped as artificial fill (Qaf), consisting of sands, silt, clay, and man-made debris. Farther west between Larkin and the East portal of Fort Mason Tunnel, the Project alignment in the eastern portion and all the alignment in the western portion, also runs through artificial fill. The remainder of the alignment runs through areas mapped as Quaternary fine- to medium-grained dune sands (Qd) (Schlocker 1974). The geologic units present within the project study area are shown in **Figure 3.11-1**.

Greater detail and updated geologic mapping is available in a geotechnical investigation of the Fort Mason Tunnel completed for the Project (Kleinfelder 2005). The tunnel was constructed using cut-and-cover methods for its western half and rock blasting for its eastern half. While the tunnel alignment is mapped at the surface as dune sands; at depth, the tunnel traverses Cretaceous sandstone and shale of the Franciscan Complex along its eastern half, and artificial fill and dune sands along its western half. The eastern side of the hill traversed by the tunnel is steep and mapped by the California Geological Survey (CGS) as being underlain by slope debris and ravine fill (Qsr). However, authors of the geotechnical investigation concluded that the material is actually artificial fill (**Figure 3.11-2**).

**Topography and Drainage.** The topography is slightly hilly in the western portion of the study area in and around Fort Mason and primarily flat with a gentle slope in the eastern portion of the project area. Elevations in the western portion range from 30 feet above mean sea level (msl) in the south to sea level; elevations in the eastern area range from approximately 95 feet above msl to sea level. Given the



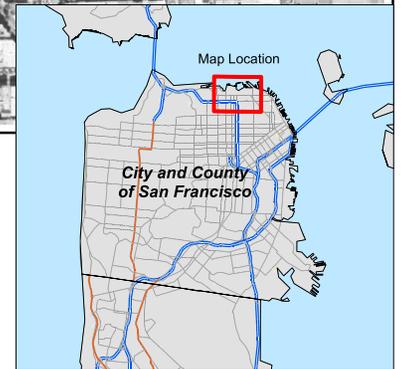
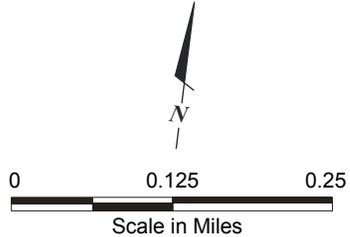
**LEGEND**

- Project Study Area
- Existing F-Market Line Stop
- Existing F-Market Line
- Proposed Fort Mason Extension**
- Above ground
- ⋯ Underground
- Proposed Fort Mason Extension Stop

**Geology**

- Qaf** Artificial Fill: sand, silt, clay, rock, and man-made debris
- Qrb** Beach Deposits: well sorted medium to coarse sand
- Qd** Dune Sand: well sorted fine to medium sand
- Kjss** Sandstone: Thick-bedded massive greywacke interlayed with thin layers of shale and sandstone
- Qsr** Slope Debris and Ravine Fill: angular rock fragments in sand, silt, and clay matrix

Source: Schlocker, 1974



**AREA GEOLOGY**

Environmental Impact Statement  
Historic Streetcar Extension  
San Francisco, California



FIGURE 3.11-1