E. Transportation, Circulation and Parking

A transportation study was prepared for the EIR and this information is used and summarized in this section.[106]

Setting

Street System

Interstate Highway 80 (I-80) and U.S. Highway 101 (U.S. 101) provide the primary regional access to the Eastern Neighborhoods, linking the project area to the East Bay (I-80, via the Bay Bridge) and to the North Bay (U.S. 101, via the Golden Gate Bridge) and the Peninsula and South Bay (U.S. 101). U.S. 101 merges with I-80 at an elevated structure in the vicinity of Division and Tenth Streets. Access to and from I-80 is provided via on- and off-ramps at Fourth, Fifth, Seventh, and Eighth Streets. Ramps to and from U.S. 101 are provided at Ninth and Tenth Streets and at César Chávez Street. I-280 provides alternative access to the Peninsula/South Bay, with ramps at King, Sixth, Mariposa, 25th, and César Chávez Streets.

Within the project vicinity, Folsom, Harrison, Bryant, Brannan, King, Third, Sixth, Seventh (north of Bryant), Eighth, Ninth, Tenth, and Division Streets, along with César Chávez Street (Guerrero to Third), South Van Ness Avenue, Potrero Avenue, and Evans Avenue (between César Chávez and Third) are designated in the *General Plan* Transportation Element as Major Arterials, which the *General Plan* defines as "cross-town thoroughfares whose primary function is to link districts within the City and to distribute traffic from and to the freeways." Guerrero, Valencia, Seventh (south of Bryant), and 16th Streets, along with César Chávez Street (east of Third), and Evans Avenue (between Third and Jennings) are Minor Arterials. Harrison, Bryant, King, Mission, Third, and 16th Streets and Potrero Avenue are Transit-Preferential (Transit Important) Streets, where "balance between modes" is appropriate and the "emphasis should be on moving people and goods, rather than on moving vehicles." The General Plan also classifies Harrison, Bryant, Valencia, Mission, Second, and Third Streets, as well as 26th Street (between Valencia and South Van Ness), as Neighborhood Commercial (Neighborhood Pedestrian) Streets. Folsom, Townsend, Valencia, Second, Seventh, Division, 16th, César Chávez, and Indiana Streets, as well as Potrero Avenue and Evans Avenue, are designated as Bicycle Routes. Portions of Valencia, Eighth, 16th, Division, and César Chávez Streets and Potrero and Evans Avenues have bicycle lanes.

Baseline intersection levels of service in the study area are presented in Table 41, p. 272.

[106] LCW Consulting, CHS Consulting Group, and Wilbur Smith Associates, *Eastern Neighborhoods Rezoning and Area Plans Transportation Study*, June 2007 This report is available for review by appointment at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Project File No. 2004.0160E.

Transit

Muni Service

Generally, the study area is well-served by public transit; however, there are pockets within each neighborhood where transit services are not available or not frequent. Due to topography constraints or the design of the roadway network, portions of neighborhoods can be isolated from convenient transit service. In addition, service tends to be more north-south in direction, limiting service from one neighborhood to another. Local service is provided by the San Francisco Municipal Railway (Muni), which can be used to access regional transit operators. Service to and from the East Bay is provided by BART, AC Transit and ferries; service to and from the North Bay is provided by Golden Gate Transit buses and ferries; and service to and from the Peninsula and South Bay is provided by Caltrain, SamTrans, and BART.

Muni lines serving the study area include the Muni Metro N-Judah and the new T-Third Street line, as well as bus lines 9-San Bruno (and 9AX and 9BX expresses), 10-Townsend, 12-Folsom, 14-Mission (and 14L limited and 14X express), 16AX and 16BX-Noriega expresses, 19-Polk, 22-Fillmore, 26-Valencia, 27-Bryant, 30-Stockton, 33-Stanyan, 45-Union/Stockton, 47-Van Ness, 48-Quintara/24th Street, 49-Van Ness/Mission, 53-Southern Heights, 67-Bernal Heights, and the 80, 81, and 82 expresses buses that serve the Caltrain station in East SoMa, as well as nighttime "Owl" service on the 90 and 91 lines. Baseline capacity utilization (riders as a percentage of capacity) at the maximum load point (the point of greatest demand) of each line ranges from 20 percent to 149 percent in the inbound direction (towards downtown), and from 30 percent to 110 percent in the outbound direction.[107] Lines operating near to or above Muni's capacity utilization standard of 85 percent include the 9-San Bruno, 12-Folsom, 22-Fillmore, 27-Bryant, 30-Stockton, 45-Union, and 48-Quintara/24th Street (inbound) and the 9-San Bruno, 9AX and 9BX-San Bruno Express, 14-Mission 14X-Mission Express, 22-Fillmore, 30-Stockton, 45-Union, and 49-Van Ness-Mission (outbound).

East SoMa

In general, most the western portion of East SoMa is within walking distance to the Market Street and Mission Street corridors, both of which are major transit corridors. However, blocks within SoMa are generally twice the length of those north of Market Street: the added length can make a transit stop two blocks away seem closer to four blocks away to the average pedestrian. The eastern part of East SoMa is served by Muni lines on Third and Fourth Streets and The Embarcadero. However, service frequency on several SoMa lines is limited, with buses on several lines operating approximately every 20 minutes in the midday. Many of the transit lines that serve SoMa also terminate in SoMa, including several at the Caltrain station.

[107] Capacity includes seated passengers and a number of standing passengers that is between 30 and 80 percent of the seated capacity depending upon the specific transit vehicle. Maximum capacities, including both seated and standing passengers, are 45 passengers for the 30-foot bus, 63 passengers for a standard 40-foot diesel or electric (trolley) bus, 94 passengers for a 60-foot (articulated) bus, and 119 passengers for a Muni Metro rail car.

Muni routes serving East SoMa are indicated in Table 37. In addition, Caltrain, SamTrans, and Golden Gate Transit serve East SoMa, and BART is relatively close, at Market Street.

East SoMa is located in the Greater Downtown, and Muni service in East SoMa is therefore appropriately analyzed using the four standard Muni "screenlines" that help describe the magnitude of Muni ridership to and from the greater downtown area by corridors, and compare ridership to capacity. Capacity utilization at the screenlines is between 73 and 87 percent under 2000 Baseline conditions, with three of the four screenlines (Northwest, Southeast and Southwest) operating at or above Muni's 85 percent of capacity standard.

TABLE 37
MUNI LINES SERVING EAST SOMA

Route	Frequency of Service (average time in minutes)		
	AM Peak Period (7 a.m. to 9 a.m.)	**Midday Period (9 a.m. to 4 p.m.)**	**PM Peak Period (4 p.m. to 6 p.m.)**
9X-San Bruno Express	10	12	10
9AX-San Bruno "A" Express	10	--	10
9BX-San Bruno "B" Express	10	--	10
10-Townsend	8	15	8
12-Folsom-Pacific	10	20	10
14-Mission	6	8	6
14L-Mission Limited	--	20	--
14X-Mission Express	9	--	10
16AX-Noriega "A" Express	10	--	15
16BX-Noriega "B" Express	10	--	15
19-Polk	10	24	10
26-Valencia	20	20	20
27-Bryant	12	12	12
30-Stockton	9	9	9
45-Union-Stockton	9	9	9
47-Van Ness	7	8	8
T-Third	10	8	20
N-Judah	7	10	7
76-Marin Headlands	Sundays and some holidays		
80X-Gateway Express	Scheduled to meet Caltrain –a.m. peak only		
81X-Caltrain Express	Scheduled to meet Caltrain – a.m. peak only		
82X-Presidio & Wharves Express	Scheduled to meet Caltrain – inbound a.m./outbound p.m.		

SOURCE: Muni Official Street & Transit Map, CHS Consulting, June 2007.

Mission

Muni service in the Mission is concentrated along Potrero Avenue and Bryant, Folsom, Mission Street, and Valencia Street in the north-south direction and along 16th, 24th, and César Chávez Streets in the east-west direction. There are also services along a portion of 15th, 18th, 25th, and

26th Streets. Muni provides transit service with in a quarter mile of all areas, although routes are more heavily oriented north-south. In addition, frequency on several lines is limited to 20-minute (or longer) headways in the mid-day. Many of the transit lines that serve the Mission also terminate in that neighborhood.

Muni routes serving the Mission District are shown in Table 38. In addition to Muni, BART provides service to the Mission via stations at 16th and 24th Streets, and SamTrans provides limited service during the morning and evening commute periods.

The maximum load point for several Muni lines, including the 14-Mission, 26-Valencia, 27-Bryant, 48-Quintara/24th Street, 53-Southern Heights, and 67-Bernal Heights occurs within the Mission District; of these lines, capacity utilization exceeds Muni's 85 percent standard on lines 14, 27, and 48. Several other lines exceed the 85 percent capacity utilization standard, although their maximum load point is outside the study area. These include lines 9, 12, 22, and 49. Capacity utilization where Muni lines cross into and out of the Mission is generally lower, generally less than 65 percent, although lines 9 and 14 exceed Muni's 85 percent standard in at least one direction at the northern boundary of this subarea (13th Street) and line 48 exceeds 85 percent capacity utilization at the eastern and western boundaries (Potrero and Guerrero Avenues, respectively).

TABLE 38
MUNI LINES SERVING THE MISSION DISTRICT

Route	Frequency of Service (average time in minutes)		
	AM Peak Period (7 a.m. to 9 a.m.)	Midday Period (9 a.m. to 4 p.m.)	PM Peak Period (4 p.m. to 6 p.m.)
9-San Bruno	10	10	8
12-Folsom-Pacific	10	20	10
14-Mission	6	8	6
14L-Mission Limited	--	20	--
22-Fillmore	10	8	7
26-Valencia	20	20	20
27-Bryant	12	12	12
33-Stanyan	15	15	15
48-Quintara/24th Street	12	10	12
49-Van Ness-Mission	8	9	8
53-Southern Heights	30	30	30
67-Bernal Heights	20	20	20
90–Owl		Late night service	

SOURCE: Muni Official Street & Transit Map, CHS Consulting, June 2007.

Showplace Square/Potrero Hill

Showplace Square/Potrero Hill is well-served by Muni, except at the southeastern portion of the subarea. Almost all of the residents and workers have access to a bus line within a two-block walking distance. However, relatively long headways between buses and indirect lines limits the usability of service. Moreover, the steep topography of Potrero Hill and the discontinuous street network in some parts of the subarea can also be limiting in terms of accessibility, as the closest stop may not be easily reached by a direct route. Additionally, service is limited in the southeastern portion of this subarea.

Muni routes serving the Showplace Square/Potrero Hill area are shown in Table 39. In addition, the 22nd Street Caltrain station straddles the border between this subarea and the Central Waterfront. Also, one SamTrans line operates on Potrero Avenue.

Capacity utilization equals or exceeds Muni's 85 percent standard on lines 9-San Bruno, 22-Fillmore, 48-Quintara/24th Street, although the maximum load points are outside this subarea for all lines except line 9. Capacity utilization where Muni lines cross into and out of Showplace Square/Potrero Hill is les than 50 percent on all lines but the 9 and 48, both because the neighborhood is of relatively low density and because a number of lines terminate in proximity to this subarea.

TABLE 39
MUNI LINES SERVING SHOWPLACE SQUARE/POTRERO HILL

Route	Frequency of Service (average time in minutes)		
	AM Peak Period (7 a.m. to 9 a.m.)	Midday Period (9 a.m. to 4 p.m.)	PM Peak Period (4 p.m. to 6 p.m.)
9-San Bruno	10	10	8
10-Townsend	8	15	8
19-Polk	10	24	10
22-Fillmore	10	8	7
33-Stanyan	15	15	15
47-Van Ness	8	9	8
48-Quintara-24th Street	12	20	12
53-Southern Heights	30	30	30
90-Owl		Late night service	

SOURCE: Muni Official Street & Transit Map, CHS Consulting, June 2007.

Central Waterfront

Muni provides relatively limited service in this subarea. Also all locations are within walking distance of at least one line, only three lines serve the subarea. In addition, the new T-Third light rail line is the sole provider of Muni service in the southern Central Waterfront.

Muni routes serving the Central Waterfront are shown in Table 40. In addition, the 22nd Street Caltrain station straddles the border between this subarea and Showplace Square/Potrero Hill.

TABLE 40
MUNI LINES SERVING THE CENTRAL WATERFRONT

Route	Frequency of Service (average time in minutes)		
	AM Peak Period (7 a.m. to 9 a.m.)	Midday Period (9 a.m. to 4 p.m.)	PM Peak Period (4 p.m. to 6 p.m.)
T-Third	10	10	8
22-Fillmore	10	8	7
48-Quintara	12	20	12
91-Owl		Late night service	

SOURCE: Muni Official Street & Transit Map, CHS Consulting, June 2007.

Although both the 22-Fillmore and 48-Quintara/24th Street equal or exceed Muni's 85 percent capacity utilization standard, these lines' maximum load points are outside the Central Waterfront. Ridership in this subarea is low, and capacity utilization where Muni lines cross into and out of the Central Waterfront is les than 35 percent on all lines, both because the neighborhood is of relatively low density and because lines 22 and 48 terminate in this subarea.[108]

Regional Transit Service

Five principal regional transit providers serve San Francisco: BART from the East Bay and Peninsula; Caltrain and SamTrans from the Peninsula; AC Transit from the East Bay, and Golden Gate Transit from the North Bay. There are also two additional East Bay ferry providers.

In the vicinity of the Eastern Neighborhoods, BART provides service along Market and Mission Streets. The 16th Street and 24th Street stations are located within the Mission District, and the Civic Center, Powell, and Montgomery stations are all within three blocks of the East SoMa area. The nearest BART station to the Showplace Square/Potrero Hill neighborhood is the 16th Street station, which can be accessed via the 22-Fillmore, 33 -Stanyan and 53-Southern Heights bus lines. The 48-Quintara provides a connection to the 24th Street BART station from Potrero Hill and the Central Waterfront.

Caltrain provides rail passenger service on the Peninsula between Gilroy and San Francisco. The Peninsula Corridor Joint Powers Board (JPB), a joint powers agency consisting of San Francisco, San Mateo, and Santa Clara Counties, operates the service. The San Francisco terminal is located

[108] Capacity utilization for the T-Third Muni Metro line was not available at DEIR publication. Since ridership information on the T-Third was not available, ridership is based on the former 15-Third bus line, while capacity is based on scheduled service frequency for the T-Third.

at Fourth and Townsend Streets, in East SoMa. The 22nd Street Caltrain station is located at 22nd Street and Pennsylvania, near the boundary between Potrero Hill and the Central Waterfront.

SamTrans (operated by the San Mateo County Transit District) provides bus service between San Mateo County and San Francisco, with 12 lines (9 provide only peak-direction commute service) serving San Francisco, including nine routes into the downtown area. In general, SamTrans service to downtown San Francisco operates along Mission Street to the Transbay Terminal. Several lines stop at Mission and Seventh Streets in East SoMa, while another stop at Fifth/Folsom and Sixth/Howard Streets, also in East SoMa. Route 391 provides limited service within the Mission District during the morning and evening commute periods, with stops at South Van Ness Avenue and 24th Street and on Mission Street at Precita Avenue. It should be noted that SamTrans is not permitted to provide local service within San Francisco.

Golden Gate Transit bus service (operated by the Golden Gate Bridge, Highway, and Transportation District), provides bus service between the North Bay (Marin and Sonoma Counties) and San Francisco, operating 18 commute bus routes and two basic routes to San Francisco. Most routes serve either the Civic Center or the Financial District. The only Golden Gate Transit stop within the study area is at Eighth and Folsom in East SoMa. Golden Gate Transit also provides ferry service between the North Bay and the San Francisco Ferry Building.

AC Transit is the primary bus operator for the East Bay, including Alameda and western Contra Costa Counties. AC Transit operates 37 routes between the East Bay and San Francisco, all of which terminate at the Transbay Transit Terminal, located on Mission Street, between First and Fremont Streets, approximately three blocks northeast of the East SoMa subarea.

In addition to the above, Alameda Harbor Bay Ferry connects Harbor Bay Isle with the San Francisco Ferry Building, weekdays during the a.m. and p.m. peak periods; the Alameda/ Oakland Ferry Service operates daily from Oakland's Jack London Square to the Ferry Building; the Blue & Gold Fleet operates ferries from Tiburon to the Ferry during peak hours on weekdays; the Vallejo Baylink connects Vallejo and San Francisco daily.

Regional transit operations are evaluated at three regional screenlines (East Bay, North Bay, and South Bay). More 31,000 transit trips currently cross the three regional screenlines, with 69 percent crossing the East Bay screenline (82 percent of which are on BART). All regional transit providers currently operate at less than their design capacity, which indicates that seats are generally available.

Pedestrians/Bicycles

The San Francisco Department of Public Health (DPH) has analyzed pedestrian injuries in traffic accidents a public health perspective. DPH notes that traffic accidents in general are a leading

cause of death and injury in the United States, and that pedestrians represented 12 percent of all fatalities in motor vehicle accidents in 2005. Beyond direct injuries and deaths, as matter of public health, DPH states that increased pedestrian safety can encourage walking, which in turn can have direct health benefits such as reducing obesity and indirect benefits such as improved air quality resulting from lesser traffic volumes.

According to data prepared by DPH, the four Eastern Neighborhoods have a substantially greater rate of pedestrian injury collisions, on a population-weighted basis, than does the City as a whole: whereas the number of accidents involving pedestrian injury citywide is approximately 100 per 100,000 population, the comparable rates in the Eastern Neighborhoods range from approximately 150 per 100,000 population in the Mission to 700 per 100,000 population in the Central Waterfront.[109] The rate in the Eastern SoMa is approximately 415 per 100,000 population, while in Showplace Square/Potrero Hill, it is about 265 per 100,000 population. San Francisco as a whole has a substantially greater number of pedestrian injury accidents on a population-weighted basis than the national average, largely because there is much more pedestrian activity than most comparably sized cities.

Among the five intersections in San Francisco where 10 or more vehicle-pedestrian collisions occurred during the period from 2001-2005, four are in the study area: 16th Street and Potrero Avenue (14 accidents), 16th and Mission Streets (13), 18th and Mission Streets (10), and Sixth and Mission Streets (10). [110]

In general, the number of pedestrian injury collisions citywide (including fatalities) has declined over the last 10 years, from 1,035 in 1996 to 718 in 2005.[111]

Pedestrian risk factors particular to each of the four Eastern Neighborhood are discussed below.

East SoMa

East SoMa generally contains adequate pedestrian facilities. Almost all signalized intersections include crosswalks and pedestrian signal heads, and most crossings include countdown timers. Sidewalks are present on almost all the major streets and most side streets, and are typically 10 feet in width. Only a few alleyways have sidewalks on one side of the street only. Townsend Street is the only major street that lacks sidewalks, with no north-side sidewalk between Fourth

[109] The Mission had the greatest total number of accidents of the four neighborhoods, 93 per year over a five-year period analyzed, but because this neighborhood has by far the greatest population of the four Eastern Neighborhoods, its rate of accidents per population is lower. The very high rate in the Central Waterfront is reflective, in part, of the very low resident population: much of the daily activity in this neighborhood is commercial activity by workers and employers, whose numbers are not counted in the "population" that is the basis of the accident rate. This neighborhood had by far the lowest total number of accidents, about nine per year. In East SoMa, the number of accidents is 82 per year, while for Showplace Square/Potrero Hill, it was about 57 per year. All accident rates are based on census tract population, which does not correlate precisely with the boundaries of the four Eastern Neighborhoods, and thus should be considered order-of-magnitude figures.

[110] Department of Parking and Traffic, *San Francisco 2005 Collision Report,* July 19, 2006; Table 6.

[111] Department of Parking and Traffic, *San Francisco 2005 Collision Report,* July 19, 2006; Figures 3 and 4.

and Seventh Streets. Barriers to pedestrian access include Rincon Hill (between Second and Beale Streets) and three intersections with freeway on- and off-ramps (Bryant/Fourth Streets, Harrison/Fourth Streets, and Harrison/Fifth Streets) that do not allow pedestrian crossing on one or more legs of the intersection. Pedestrian volumes are generally low to moderate, except near the Caltrain station where volumes are higher when trains arrive and depart. Sidewalks are generally adequately in width to accommodate existing pedestrian circulation. The one major pedestrian generator in East SoMa is AT&T Park, which attracts high pedestrian volumes before and after ballgames and other events.

Pedestrian conditions in East SoMa are largely dictated by the particular street grid of the neighborhood. As noted above, blocks within the South of Market neighborhood in general are typically twice the length of those north of Market Street. The result of this larger-than-normal street grid is that pedestrians typically have to walk farther to reach a crosswalk than do pedestrians in other parts of the City. Moreover, because most of the major streets in East SoMa (and in the South of Market generally) are wider than the typical San Francisco street, because many of these same streets carry one-way traffic only, and because many East SoMa streets (and those in the South of Market generally) serve as access routes to and from the elevated I-80 freeway, the street grid in East SoMa is generally not conducive to pedestrians. An additional factor contributing to adverse pedestrian conditions in Eastern SoMa is the fact that many vehicle travel at relative higher speeds, both because of the prevalence of multi-lane one-way streets (e.g., Howard, Folsom, Harrison, Bryant, Third, and Fourth Streets) and because many of these same streets, and others, such as Fifth and Sixth Streets, serve as connections to and from freeway on- and off-ramps. Finally, Eastern SoMa has a relatively large transient population, including homeless persons and those temporarily resident in various shelter facilities; some of these individuals may be suffering and/or recovering from substance abuse or other conditions that may make them particularly vulnerable to pedestrian accidents.

Bicycle routes with separate bike lanes (Class II route) are on The Embarcadero and King, Seventh, Eighth, Folsom, and Howard (west of Fremont) Streets. Class III routes, where bicycles share the roadway with vehicle traffic, exist on Second, Third, Fifth, Harrison, Division, Townsend, and Howard (east of Fremont) Streets. Also, Market Street, just north of East SoMa, is a major Class III bicycle route. Bicycle volumes in the East SoMa subarea in general were observed to be low to moderate. During field surveys, a substantial number of bicyclists were observed on Folsom Street (Route #30) and on Division Street (Route #36).

Mission District

Most of Mission District streets have sidewalks and crosswalks and pedestrian volumes are generally low to moderate in residential and industrial areas and moderate to high in the core of the commercial areas. Many signalized intersections in the residential areas have separate pedestrian signals on only some legs of the intersection or not at all, while many other

intersections in the commercial areas have pedestrian countdown signals. Most intersections have crosswalks, and adequate sidewalks are present on almost all streets. The more industrial area north of 20th Street between Potrero Avenue and Folsom Street has more unsignalized intersections and fewer pedestrian signal heads where intersections are signalized. There are also more intersections without crosswalks than elsewhere in the Mission.

The Mission has the by far the largest existing population of the four Eastern Neighborhoods. That fact, along with the vibrant retail culture of Mission Street, the relatively high percentage of Mission residents who do not have access to a private vehicle, and the presence of two BART stations (16th and 24th Streets) as well as numerous Muni lines makes for high pedestrian volumes along Mission Street and in the Mission neighborhood in general. These volumes, in addition to relatively congested traffic conditions along Mission Street and its side streets, tend to produce more vehicle-pedestrian conflicts in the Mission than in many other San Francisco neighborhoods.

Bicycle routes with separate bike lanes (Class II route) include 14th, Valencia, and Harrison Street (between Division and 22nd Streets) and Potrero Avenue (between 17th and César Chávez Streets). Class III routes exist on 17th, 22nd, César Chávez, and Harrison (between 22nd and 26th) Streets. Bicycle volumes in the Mission District in general were observed to be low to moderate, except that substantial numbers of bicyclists were observed on Harrison Street (Route #33) and Valencia Street (Route #45).

Showplace Square/Potrero Hill

Although Showplace Square has become a center of the furnishings industry, many streets still reflect the earlier industrial nature of the area, and many streets do not have sidewalks or crosswalks, including portions of De Haro, Rhode Island, Henry Adams (Kansas), Vermont, Ninth, Utah, and Berry Streets; vehicles ranging from automobiles to large trucks often park perpendicular to buildings where a sidewalk would otherwise be found, and trucks sometimes partially or completely block the sidewalks that do exist, interfering with pedestrian circulation and forcing pedestrians to walk in the roadways. However, because pedestrian and traffic volumes are low, conflicts are relatively minimal. There are few signalized intersections in Showplace Square, except the northernmost portion. The combination of the above factors creates relatively unfriendly conditions for pedestrians in the area. The primarily residential portion of Potrero Hill, in contrast, has crosswalks at nearly all intersections, and sidewalks on virtually all streets. Although there are no signalized intersections, pedestrian conditions are generally better than in Showplace Square. However, the steep grades on many streets, such as portions of 18th, 19th, and 20th Streets, makes pedestrian access difficult, especially for disabled persons. Pedestrian volumes in the area are generally low.

Although existing pedestrian volumes are relatively light in this subarea, pedestrian circulation is hampered somewhat by discontinuities in the sidewalk network and a lack of marked crosswalks

in Showplace Square and by the relatively heavy volume of truck traffic. As noted previously, incidences of missing sidewalks and trucks and other vehicles blocking both existing sidewalks and other potential pedestrian ways are relatively common. On Potrero Hill itself, there are few impediments to pedestrian circulation, and pedestrian volumes are relatively light.

Bicycle routes with separate bike lanes (Class II route) include Potrero Avenue (between 17th and César Chávez Streets), and parts of Seventh, Eighth, Division, 16th, and César Chávez Streets. Class III routes exist on parts of Townsend, Henry Adams (Kansas), 17th, Mariposa, 23rd, Kansas, and César Chávez Streets. Bicycle volumes in the Showplace Square/Potrero Hill subarea were observed to be low, although during the p.m. peak period, a substantial number of bicyclists were observed to be riding along 16th and 17th Streets and Potrero Avenue.

Central Waterfront

Within the Central Waterfront subarea, sidewalks and crosswalks generally exist along the major streets, such as Third Street and 20th Street, as well as in the Dogpatch residential enclave. Many other streets in the industrial portions of this subarea do not have sidewalks or have discontinuous sidewalks, and are lacking crosswalks. As in Showplace Square, vehicles parked perpendicular to buildings can obstruct the pedestrian way, resulting in pedestrians having to walk in traffic lanes. This is especially true in the southern and eastern section of the subarea.[112] However, because pedestrian volumes are low, pedestrian-vehicle conflicts are relatively minimal. In contrast, Third Street has gained major pedestrian improvements as part of the recently completed installation of Muni's T-Third light rail line, with new signals and crosswalks having been incorporated into the project design. Elsewhere in the Central Waterfront, signalized intersections are few, except on Mariposa and César Chávez Streets at the north and south ends of the neighborhood.

With the smallest residential population of the four Eastern Neighborhoods, the Central Waterfront has relatively little pedestrian traffic. Nevertheless, pedestrian circulation is hampered by many of the same factors as in Showplace Square, including discontinuous sidewalk networks and/or obstructed pedestrian ways, a lack of crosswalks, and heavy truck traffic. Other than in and around the Dogpatch residential enclave and along Third Street, where pedestrian improvements have recently been made as part of the T-Third light rail line construction, pedestrian amenities tend to be lacking in much of this subarea.

Bicycle routes with separate bike lanes (Class II route) include parts of César Chávez and Indiana Streets. Class III routes exist on Illinois Street and on parts of Indiana, Minnesota, Mariposa, 23rd, and Third Streets. Bicycle volumes in the Central Waterfront neighborhood were observed to be low.

[112] The eastern part of the Central Waterfront, generally east of Illinois Street, is within Port jurisdiction.

Parking

Baseline parking supply and occupancy conditions within the four neighborhoods were based on field observations, and general occupancy conditions were recorded. Information on publicly-owned parking facilities is also presented here.

In general, on-street parking is typically fully occupied or nearly so, except in the lower-density residential neighborhoods of Potrero Hill, and at night in commercial and industrial areas of the NEMIZ, Showplace Square, and Central Waterfront.

East SoMa

Metered parking spaces are typically provided on both sides of the larger streets in East SoMa. Many of the smaller mid-block streets allow parking only on one side. On-street parking spaces were observed to be generally well-utilized during weekday midday hours. Two residential permit parking areas (in which parking without a permit is permitted for only a limited duration) cover parts of this subarea, primarily in the western extension around Sixth Street. There are no city-operated parking facilities in East SoMa subarea. However, there are several privately-owned parking lots and garages available to the general public. These parking facilities are generally fully occupied on weekdays.

Mission District

Within the commercial portions of the Mission District, parallel on-street parking spaces, both metered and un-metered, exist on both sides of the street. Vehicles often double-park on Mission Street and on the cross-streets. The center two-way left-turn lane on Valencia Street is often used illegally for parking when parking conditions are full especially between 16th and 17th Streets.

Within the residential portions of the Mission District, many streets have perpendicular parking spaces on one side and parallel parking spaces on the other side. Residential permit parking is generally provided south of 17th Street along the residential streets between the major north-south streets (i.e., along Bartlett, Capp, and Shotwell Streets and surrounding blocks), as well as in the southwest corner of this subarea (near St. Luke's Hospital), in the southeast portion of the Mission (near San Francisco General Hospital), and in the northwest portion of the subarea, close to Market Street. Double-parked cars are occasionally seen in some areas, though much less commonly than in the commercial areas. Parking conditions are generally full or very full.

The industrial portions of the Mission District have more irregular parking conditions. There are blocks with parallel parking on both sides of the street, blocks with perpendicular parking on both sides of the street, and blocks with combinations of parallel and perpendicular parking. There are generally few instances of double-parked cars. In general, there are fewer restrictions on parking in the industrial portions than in the other portions of the Mission. Parking conditions are

generally full during the midday, though decidedly less full than the commercial and residential portions of the district.

There are four city-operated off-street parking facilities in the Mission District: Mission & Bartlett with 350 spaces, Mission & Otis with 59 spaces, 16th & Hoff with 98 spaces, and Mission & 24th with 20 spaces. The total number of parking spaces in these four facilities is 527 spaces. There are numerous privately-owned parking facilities in this subarea and almost all of them serve the employees and visitors to the businesses adjacent to them and are not available for general public parking.

Showplace Square/Potrero Hill

On-street parking in the industrial and some commercial portions of Showplace Square subarea consists of a combination of parallel and perpendicular spaces, with irregular layout of the roadway, sidewalks, and parking areas prevalent. Field observation noted some double-parked trucks and vehicles partially or completely blocking the sidewalks.

On-street parking in the residential area of Potrero Hill is usually parallel, and mostly unmetered, although several commercial blocks have metered parking spaces. Residential permit parking is provided in the southwestern portion of this subarea, near San Francisco General Hospital, and in northeast, around the 18th Street commercial strip. Parking conditions are moderately full during the weekday midday.

There are no city-operated parking lots in the Showplace Square/Potrero Hill subarea. There are several private parking facilities, mostly serving employees and business customers, and not publicly available.

Central Waterfront

On-street parking in the Central Waterfront is generally full or moderately full during midday, except along Indiana Street and portions of Illinois Street. The area has substantially number of double-parked vehicles, especially in the southern part of the subarea. Field trips also noted relatively large number of tractor-trailers on the street. These trailers are often parked end-to-end for a whole block and then stayed at the same spot for a long period of time.

This is the only neighborhood among the four that does not have residential permit parking and on-street parking in this subarea is generally unmetered and of unlimited duration, except along Third Street, which has metered spaces. Adjacent to the Third Street light rail stations, on-street parking spaces have been removed to make the right-of-way for the stations. Parking conditions on Third Street are generally full during the midday.

There are no city-operated parking lots in the Central Waterfront subarea, and only a limited number of privately-owned parking facilities, not generally available for public parking.

Impacts

Significance Criteria

The operational impact on signalized intersections is considered significant when project-related traffic causes the intersection level of service to deteriorate from LOS D or better to LOS E or F, or from LOS E to LOS F.[113] The project may result in significant adverse impacts at intersections that operate at LOS E or F under baseline conditions depending upon the magnitude of the project's contribution to the worsening of the average delay per vehicle. In addition, the project would have a significant adverse impact if it would cause major traffic hazards or contribute considerably to cumulative traffic increases that would cause deterioration in levels of service to unacceptable levels.

Parking supply is not considered to be a part of the permanent physical environment in San Francisco.[114] Parking conditions are not static, as parking supply and demand varies from day to day, from day to night, from month to month, etc. Hence, the availability of parking spaces (or lack thereof) is not a permanent physical condition, but changes over time as people change their modes and patterns of travel.

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

[113] The LOS analysis provides a standardized means of rating an intersection's operating characteristics on the basis of traffic volumes, intersection capacity, and delays. LOS A represents free-flow conditions, with little or no delay, while LOS F represents congested conditions, with extremely long delays; LOS D (moderately high delays) is considered the lowest acceptable level in San Francisco.

[114] Under California Public Resources Code, Section 21060.5, "environment" can be defined as "the physical conditions which exist within the area which will be affected by a proposed project, including land, air, water, minerals, flora, fauna, noise and objects of historic or aesthetic significance."

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

The project would have a significant effect on the environment if it would cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service; or cause a substantial increase in delays or operating costs such that significant adverse impacts in transit service levels could result.

The project would have a significant effect on the environment if it would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

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

The project would have a significant effect on the environment if it would result in a loading demand during the peak hour of loading activities that could not be accommodated within the proposed on-site loading facilities or within convenient on-street loading zones, and if it would create potentially hazardous traffic conditions or significant delays affecting traffic, transit, bicycles or pedestrians.

Construction-related impacts on transportation systems generally would not be considered significant due to their temporary and limited duration.

Travel Demand Analysis

The San Francisco County Transportation Authority (SFCTA) countywide travel demand forecasting model was used to develop the travel forecasts for development and growth through the year 2025 in the Eastern Neighborhoods study area. This approach results in an impacts assessment for year 2025 conditions that takes into account both the future development expected in the Eastern Neighborhoods and the expected growth in housing and employment for the remainder of San Francisco and the nine-county Bay Area.

This analysis of travel demand is based on assumptions about future land uses (e.g., anticipated development) prepared by the Planning Department as part of its Land Use Allocation 2002 forecasting process, the same forecasting effort that was the basis of the three rezoning options developed for the 2003 *Rezoning Options Workbook* that form the basis of the project description in this EIR. The growth forecasts were prepared for each traffic analysis zone, or TAZ, within the study area, as well as for the TAZs that cover the remainder of the City.

Travel demand was estimated for the following four land use scenarios:

- **2025 No Project**—Assumes future development and growth consistent with the forecasts by the Association of Bay Area Governments (ABAG) for San Francisco and the Bay Area based on ABAG's *Projections 2002*, the current regional growth forecast at the time that the Land Use Allocation 2002 was developed.

- **2025 No Project plus Rezoning Option A—**Includes the additional development associated with Option A of the proposed Eastern Neighborhoods Rezoning and Area Plans project.

- **2025 No Project plus Rezoning Option B—**Includes the additional development associated with Option B of the proposed Eastern Neighborhoods Rezoning and Area Plans project.

- **2025 No Project plus Rezoning Option C—**Includes the additional development associated with Option C of the proposed Eastern Neighborhoods Rezoning and Area Plans project.

No separate cumulative model run was undertaken, because, as noted, the 2025 forecasts developed by the Planning Department include growth in the remainder of San Francisco, as well as in the rest of the Bay Area. Thus, each rezoning option effectively is represents a different cumulative growth scenario for the year 2025, including growth from development that would occur with implementation of the proposed Eastern Neighborhoods Rezoning and Area Plans, as well as other, non-project-generated growth accounted for in the 2025 No-Project scenario.

The SFCTA model indicates that background growth in the study area, under the 2025 No-Project scenario, would generate approximately 73,000 new daily person trips, of which 22,000 would be vehicle trips. This would represent approximately a 10 percent increase over 2000 Baseline conditions.

With the proposed project, development forecast to occur in the study area as a result of implementation of the proposed rezoning and area plans project would increase daily traffic volumes by between about 7.5 percent and 13.3 percent over 2025 No-Project conditions. Total daily person-trips via all modes are projected to increase over 2025 No-Project conditions by 8.1 percent under Option A (64,000 additional new daily person trips, of which 26,700 would be vehicle trips), 7.5 percent under Option B (58,900 additional new daily person trips, of which

27,900 would be vehicle trips), and 13.3 percent under Option C (104,700 additional new daily person trips, of which 44,500 would be vehicle trips).[115]

Future Transportation Improvements

A number of intersection improvements are assumed to occur in and near the project area, mostly in connection with ongoing development in Mission Bay. These include installation of new traffic signals at the intersections of 16th/Vermont Streets and Mariposa Street/southbound I-280 on-ramp, and restriping, reconfiguration, or other improvements at the intersections of Third/16th Streets, Third/Mariposa Streets, Seventh/Brannan Streets, Seventh/Townsend Streets, Eighth/Townsend/ Division/Kansas Streets, 16th Street/Potrero Avenue, Mariposa Street at the I-280 off- and on-ramps. Substantial street improvements are proposed within the Mission Bay area as well. Muni plans to extend either the 30-Stockton or 45-Union bus line from the Caltrain station to a new terminal in Mission Bay, in the vicinity of 20th and Third Streets via Potrero Hill, and also plans to re-route the 22-Fillmore line to continue along 16th Street rather than traveling over Potrero Hill (service over the hill would be replaced by the 30 or 45 line). The Municipal Transportation Agency and the Controller's Office have undertaken the Transit Effectiveness Project to review, evaluate, and make recommendations for the Muni system as a whole (see discussion in Section IV.B, Plans and Policies, p. 111). The Municipal Transportation Agency is also currently working on a *Southeast Mission Pedestrian Safety Plan*, to improve walking conditions in the area bounded by Potrero Avenue and César Chávez, 24th, and Mission Streets, with proposed bulb outs, ladder crosswalks, pedestrian countdown signals, and red-light photo-enforcement cameras; funding has yet to be obtained. A number of bicycle improvements are proposed as part of the City's *2005 Bicycle Plan*, which is undergoing CEQA review. Pending completion of environmental review and plan adoption, the following new bicycle lanes are contemplated (project area subarea in parentheses):

- Second Street between Market and King Streets (East SoMa);
- Fifth Street between Market and Townsend Streets (East SoMa);
- 14th Street between Market and Dolores Streets (Mission District) (implemented);
- 17th Street corridor between Kansas Street and Corbett Avenue, including Potrero Avenue between 17th and Division Streets (Showplace Square/Potrero Hill);
- 23rd Street between Kansas Street and Potrero Avenue (Potrero Hill);
- Townsend Street between The Embarcadero and Eighth Street (East SoMa);
- Division Street between Ninth and 11th Streets (Showplace Square/Potrero Hill);
- César Chávez Street/26th Street corridor between U.S. 101 and Sanchez Street (Mission);
- César Chávez Street between U.S.101 and I-280 (Central Waterfront);

[115] Although a single rezoning option was developed as part of the draft Central Waterfront Neighborhood Plan, compared to three options in each of the other three neighborhoods, the Planning Department growth projections upon which the transportation analysis is based nevertheless assume different levels of growth in the Central Waterfront under each rezoning option. This is because, as stated in Section IV, Approach, the forecasts present different potential approaches to accommodating population growth in San Francisco. The emphasis on more or less growth in certain neighborhoods is assumed to have a "ripple effect" on other neighborhoods, as well.

- Illinois Street between 16th Street and Islais Creek (Central Waterfront);
- Mississippi Street between Mariposa and 16th Streets (Showplace Square/Potrero Hill);
- Kansas Street between 23rd and 26th Streets (Showplace Square/Potrero Hill); and
- Potrero Avenue/Bayshore Boulevard south of 25th Street (Mission and Potrero Hill).

- The San Francisco Planning Department, the San Francisco Municipal Transportation Agency (SFMTA), and the San Francisco County Transportation Authority (SFCTA) have submitted a grant request to the Metropolitan Transportation Commission's Station Area Planning Program to help fund the Eastern Neighborhoods Transportation Implementation Planning (EN TRIPS) Study. The EN TRIPS Study would allow these agencies to conduct the further planning, design and environmental review work necessary to advance plan-identified transportation improvements towards on-street implementation. This work is anticipated to lead to the delivery of key infrastructure projects needed to serve new housing (affordable and market rate) and mixed-use development.

- Specifically, the EN TRIPS Study would: review and document existing conditions in the Eastern Neighborhoods; evaluate future year land use and transportation conditions (2008-2025); define street functions and designs; develop and design key transportation and public realm improvement projects; conduct outreach to ensure the transportation needs of residents and businesses are clearly understood; create a funding and implementation strategy as well as draft and final reports; and, fund environmental assessment of select projects consistent with EN TRIPS goals.

Traffic Impacts

Impacts associated with the proposed project were judged by comparing conditions in 2025 with a particular project rezoning option against 2025 No-Project conditions. The analysis evaluated weekday p.m. peak-hour levels of service at 40 study intersections in and near the study area for each rezoning option. Intersections were analyzed in each of the four Eastern Neighborhoods, with the focus on heavily traveled arterial routes and other major connector streets through the study area, as well as on intersections currently experiencing poor operating conditions and those likely to be most affected by development within the Eastern Neighborhoods. Study intersections are shown in **Figure 16**.

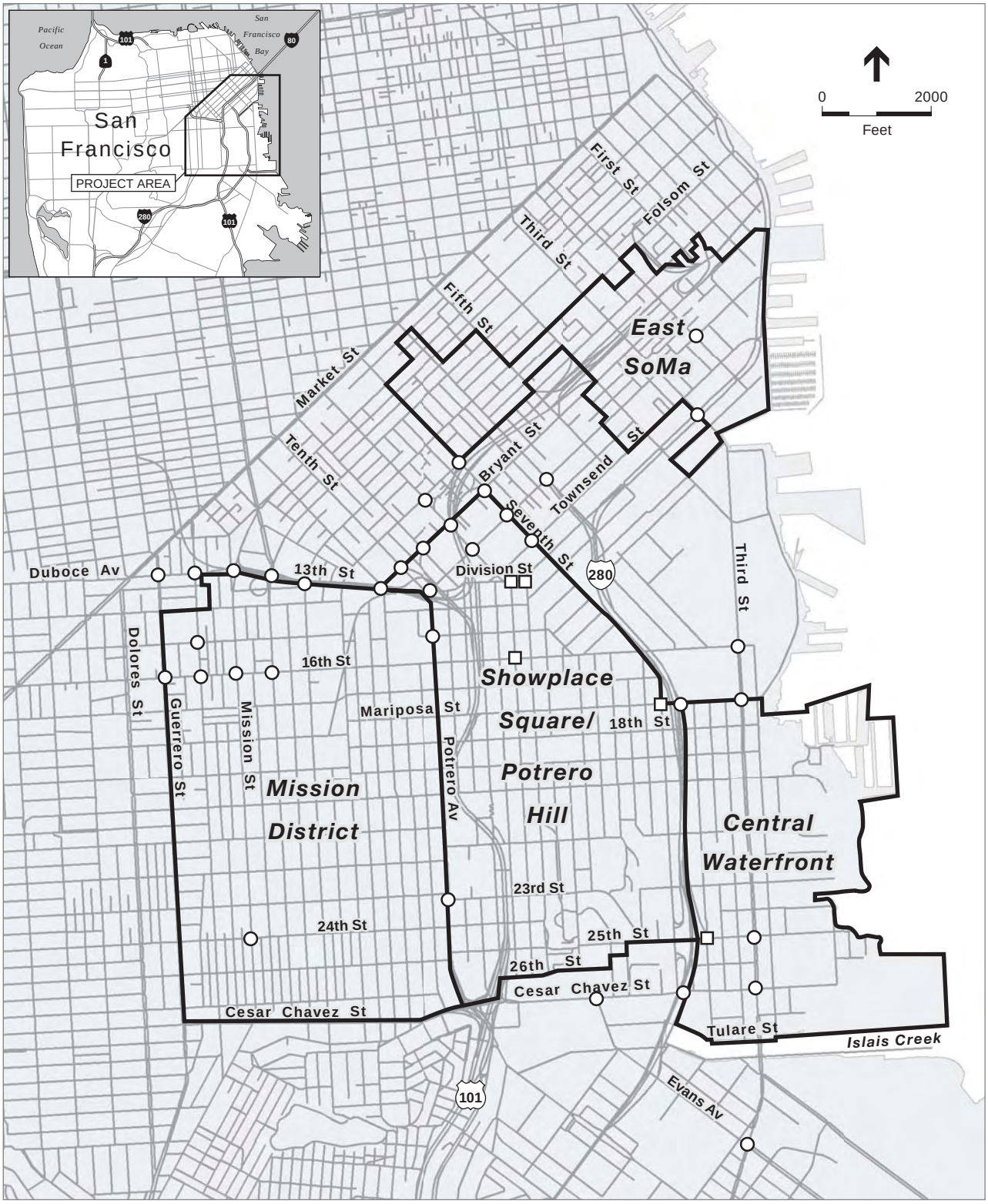
Under baseline conditions, 35 of the 40 intersections studied operate at acceptable (LOS D or better) service levels during the p.m. peak hour, while five intersections operate unacceptably (LOS E or F) (see Table 41). The five intersections where peak-hour operations are unacceptable include three that are directly affected by adjacency to freeway on- and off-ramps (Sixth and Brannan Streets, South Van Ness Avenue/ Howard Street/13th Street, and the unsignalized intersection of Mariposa Street and the I-280 southbound on-ramp), a fourth intersection that is one block upstream of the South Van Ness Avenue on-ramp to southbound U.S. 101 (Mission/Otis/13th Streets), and the irregularly configured intersection of Tenth, Division, and

Brannan Streets and Potrero Avenue. Each of these five intersections operates at LOS E under baseline conditions, except the unsignalized intersection of Mariposa Street and the I-280 southbound on-ramp, which operates at LOS F.

2025 No-Project Scenario

Under 2025 No-Project conditions, 18 of the 40 intersections would operate at LOS E or LOS F (see Table 41). In general, the poor operating conditions would occur along the primary access routes to and from the I-80/U.S. 101 and I-280 ramps. As previously noted, intersections leading to freeway ramps are congested during the evening commute hours, and this congestion is projected to increase in the future.

Three of the four study intersections in East SoMa would operate at unacceptable (LOS E or F) conditions (as compared with one under baseline conditions): Third/King Streets, Sixth/Brannan Streets, and Seventh/Harrison Harrison Streets. In the Mission, three of 13 study intersections would operate at LOS E or LOS F (as compared with two under baseline conditions): Guerrero Street/Duboce Avenue, Mission/Otis/13th Streets, and South Van Ness Avenue/13th Street. In Showplace Square/Potrero Hill, nine of 15 study intersections are projected to operate at LOS E



○ Signalized Intersection □ Unsignalized Intersection

SOURCE: ESA

Case No. 2004.0160E: Eastern Neighborhoods Rezoning and Area Plans (203091)

Figure 16
Study Intersections

TABLE 41
INTERSECTION LEVEL OF SERVICE, BASELINE, 2025 NO PROJECT AND PROJECT ALTERNATIVES – WEEKDAY PM PEAK HOUR

Intersection	Baseline		2025 No Project		2025 Option A		2025 Option B		2025 Option C	
	Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Eastern SoMa										
Brannan St/Second St	13.4	B	14.2	B	15.0	B	15.9	B	14.9	B
Third St/King St	43.7	D	**>80**	**F**	**>80**	**F**	**>80**	**F**	**>80**	**F**
Sixth St/Brannan St	**67.4**	**E**	**>80**	**F**	**>80**	**F**	**>80**	**F**	**>80**	**F**
Seventh St/Harrison St	19.6	B	**61.8**	**E**	**>80**	**F**	**>80**	**F**	**75.2**	**E**
Mission										
13th St/Bryant St	30.7	C	36.0	D	42.4	D	**70.9**	**E**	**56.8**	**E**
13th St/Folsom St	31.2	C	26.9	C	38.6	D	**69.0**	**E**	52.8	D
Guerrero St/16th St	23.4	C	36.0	D	44.4	D	42.5	D	48.9	D
Guerrero St/Duboce Ave	44.8	D	**>80**	**F**	**>80**	**F**	**>80**	**F**	**>80**	**F**
Mission St/16th St	30.8	C	34.7	C	36.8	D	36.7	D	36.8	D
Mission St/24th St	28.0	C	36.3	D	33.6	C	34.8	C	42.2	D
Mission/Otis/13th	**65.2**	**E**	**70.8**	**E**	**67.2**	**E**	**70.1**	**E**	**76.4**	**E**
Potrero St/23rd St	24.6	C	26.8	C	28.5	C	27.5	C	25.5	C
So. Van Ness Ave/16th St	15.9	B	17.0	B	17.5	B	17.4	B	16.9	B
So. Van Ness/Howard/13th St	**59.1**	**E**	**61.1**	**E**	**77.0**	**E**	**>80**	**F**	**>80**	**F**
Valencia St/15th St	18.3	B	24.8	C	27.1	C	27.1	C	25.0	C
Valencia St/16th St	19.3	B	21.0	B	21.5	C	21.9	C	21.8	C
Valencia St/Duboce Ave	28.8	C	37.6	D	41.9	D	42.7	D	43.9	D
Showplace Square/Potrero Hill										
Seventh St/Brannan St [3]	31.8	C	45.4	D	**>80**	**F**	**>80**	**F**	**>80**	**F**
Seventh St/Bryant St	26.0	C	**>80**	**F**	**>80**	**F**	**>80**	**F**	**>80**	**F**
Seventh St/Townsend St [3]	21.4	C	30.4	C	52.9	D	**74.0**	**E**	**57.2**	**E**
Eighth St/Brannan St	30.5	C	39.0	D	33.1	C	43.9	D	**56.7**	**E**
Eighth St/Bryant St	44.4	D	**70.5**	**E**	**56.4**	**E**	**>80**	**F**	**>80**	**F**
Eighth St/Harrison St	52.6	D	**60.9**	**E**	**62.8**	**E**	**>80**	**F**	**>80**	**F**
Ninth St/Bryant St	53.7	D	**>80**	**F**	**73.2**	**E**	**>80**	**F**	**>80**	**F**
Tenth St/Bryant St	16.6	B	23.1	C	18.3	B	32.0	C	17.8	B
Tenth/Division/Brannan/Potrero	**64.1**	**E**	**>80**	**F**	**>80**	**F**	**>80**	**F**	**>80**	**F**
Division/King/De Haro	9.6 (eb)	A	**>50 (eb)**	**F**	**>50 (eb)**	**F**	**>50 (eb)**	**F**	**>50 (eb)**	**F**
Mariposa St/I-280 NB off-ramp [3]	30.3	C	36.4	D	39.0	D	39.5	D	41.7	D
Mariposa St/I-280 SB on-ramp [3]	**>50 (eb)**	**F**	18.6	C	18.1	B	16.6	B	17.1	B
Potrero Ave/16th St [3]	19.3	B	**>80**	**F**	**>80**	**F**	**>80**	**F**	**>80**	**F**
Rhode Island St/16th St	22.9 (nb)	C	**>50 (sb)**	**F**	**>50 (sb)**	**F**	**>50 (sb)**	**F**	**>50 (sb)**	**F**
Rhode Island St/Division St	10.7 (wb)	B	**>50 (eb)**	**F**	**>50 (eb)**	**F**	**>50 (eb)**	**F**	**>50 (eb)**	**F**
Central Waterfront										
16th St/Third St	35.8	D	37.3	D	49.2	D	38.7	D	36.0	D
25th St/Third St	20.4	C	24.2	C	40.2	D	39.2	D	36.0	D
Third St/César Chávez St	30.9	C	**57.3**	**E**	**>80**	**F**	**>80**	**F**	**>80**	**F**
Third St/Evans Ave	33.7	C	**67.8**	**E**	**>80**	**F**	**>80**	**F**	**77.9**	**E**
Third St/Mariposa St [3]	17.2	B	25.8	C	32.0	C	31.8	C	27.7	C
César Chávez/Evans Ave [4]	45.3	D	26.4	C	**>80**	**F**	**71.2**	**E**	**71.2**	**E**
César Chávez/Pennsylvania/I-280	29.0	C	32.7	C	53.9	D	**56.4**	**E**	52.1	D
25th St/Indiana St	12.0 (wb)	B	**44.0 (wb)**	**E**	**>50 (wb)**	**F**	**>50 (wb)**	**F**	**>50 (wb)**	**F**

[1] Delay in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
[2] Intersections operating at LOS E or LOS F conditions highlighted in **bold;** box indicates significant project or cumulative impact.
[3] Year 2025 analysis includes reconfiguration of intersection as part of Mission Bay Redevelopment Plan.
[4] Year 2025 analysis includes modifications to the César Chávez viaduct. This improvement will be conducted as part of the Hunters Point Shipyard Project.

Source: Wilbur Smith Associates, June 2007.

or F (as compared with two under baseline conditions): Seventh/Bryant Streets, Eighth/Bryant Streets, Eighth/Harrison Streets, Ninth/Bryant Streets, Tenth/Division/Brannan Streets/Potrero Avenue, Potrero Avenue/16th Street, Division/King/De Haro Streets, Rhode Island/16th Streets, and Rhode Island/Division Streets (the last three intersections are unsignalized). And in the Central Waterfront, three of the four study intersections would operate at LOS E or LOS F under 2025 No-Project conditions (as compared with no intersections under baseline conditions): Third/César Chávez Streets, Third Street/Evans Avenue, and the unsignalized intersection of 25th/Indiana Streets.[116]

Proposed Project

The addition of traffic from development anticipated to occur with implementation of the proposed project would result in the following impacts, discussed by neighborhood.

East SoMa

The three study intersections that are projected to operate at LOS E or F under 2025 No-Project conditions would continue to operate at unacceptable LOS conditions during the weekday p.m. peak hour under all three rezoning options (see Table 41). These intersections include Third/King Streets, Sixth/Brannan Streets, and Seventh/Harrison Harrison Streets. At Seventh/Harrison, intersection operating conditions would change from LOS E to LOS F under Options A and B, and therefore these rezoning options would result in significant impacts at this intersection. Under Option C, conditions would remain at LOS E (as under 2025 No-Project conditions); however, the vehicles added by Option C to the movements that determine overall LOS performance at Seventh/Harrison would represent a considerable contribution to the 2025 Cumulative conditions, and Option C would have a significant impact at this intersection. At the intersections of Third/King and Sixth/Brannan, LOS would remain the same as under 2025 No-Project conditions, but traffic generated by all three rezoning options would add substantial numbers of vehicles to some movements that determine overall LOS performance. Therefore, the traffic added by all three options would represent a considerable contribution to the cumulative conditions, and each option would have a significant cumulative impact on these intersections.

Mitigation measures for the above impacts (see Chapter V), would include implementation Intelligent Traffic Management Systems (“ITMS”) strategies, improvement and enhancement of streets, promotion of alternative means of travel, and parking management to discourage driving. However, it is not anticipated that the significant adverse effects at local intersections could be fully mitigated, and thus these impacts are considered significant and unavoidable.

[116] The currently unsignalized intersection of Mariposa Street and the I-280 southbound on-ramp is anticipated to be signalized before 2025 as part of development in the Mission Bay area, and this signalization is assumed in all 2025 analysis scenarios. This intersection, which operates at an unacceptable LOS F under 2000 baseline conditions, would operate at LOS C when signalized under the 2025 No-Project scenario. Mission-Bay–related improvements are also assumed by 2025 at Seventh/Brannan, Seventh/Townsend, Potrero/16th, and Mariposa/I-280 northbound off-ramp.

Mission

Of the 13 study intersections in the Mission, three intersections would operate at LOS E or F during the weekday p.m. peak hour under Option A (the same number as under 2025 No-Project conditions), five would operate at LOS E or F under Option B, and four would do so under Option C (see Table 41). The three intersections that are projected to operate at LOS E or F under 2025 No-Project conditions would continue to operate at unacceptable LOS under each rezoning option. These intersections include Guerrero Street/Duboce Avenue, Mission/Otis/13th Streets, and South Van Ness Avenue/13th Street.

At the intersections of Guerrero/Duboce and Mission/Otis/13th, LOS would remain unchanged from 2025 No-Project conditions, but project traffic would add vehicle to some movements that determine overall LOS performance, and these additions would represent a considerable contribution to the cumulative conditions such that each option would have a significant cumulative impact on these intersections. The intersection of South Van Ness/Howard/13th would continue to operate at LOS E under Option A, as under 2025 No-Project conditions; however Option A would add traffic to some movements that determine overall performance, and would have a significant impact at this intersection.

Under Option B, the South Van Ness/Howard/13th intersection would degrade to LOS F, resulting in a significant impact. In addition, the intersections of 13th/Bryant/11th/Division and 13th/Folsom would degrade to LOS E, resulting in a significant impact.

Under Option C, operating conditions at South Van Ness/Howard/13th would degrade to LOS F, resulting in a significant impact. In addition, 13th/Bryant/11th/Division would operate at LOS E, also resulting in a significant impact.

Mitigation measures for the above impacts (see Chapter V), would include implementation Intelligent Traffic Management Systems ("ITMS") strategies, improvement and enhancement of streets, promotion of alternative means of travel, and parking management to discourage driving. However, it is not anticipated that the significant adverse effects at local intersections could be fully mitigated, and thus these impacts are considered significant and unavoidable.

The *People's Plan*, a project variant for the Mission District described in Chapter III, Project Description (see p. 17), proposes a similar land use scheme to that of Option B, although it would include overlay zones to further limit certain changes, such as an overlay zone that would require no net loss of auto service PDR space along South Van Ness Avenue from Division Street to 18th Street, and a Mixed-Use/PDR area that would farther north and east than would comparable zoning under Option B. There are no growth projections for the *People's Plan* comparable to those for the three rezoning options analyzed in detail in this EIR, and therefore no quantitative transportation analysis is possible. However, because of the differences between Option B and the *People's Plan* noted above, it is likely that the *People's Plan* would have effects on local

intersections that would fall in severity in between those described for Options A and B. The other project variant in the Mission, the plan put forth by the Mission Coalition for Economic Justice and Jobs (MCEJJ; see p. 18), calls for more flexibility in permitted land uses in the NEMIZ, including "NEMIZ Mixed-Use" zone south of 16th Street, which would allow for a broad mix of uses similar to existing industrial zoning. As with the *People's Plan*, there are no growth projections for the MCEJJ comparable to those for the three rezoning options analyzed in detail in this EIR, and therefore no quantitative transportation analysis is possible. However, because the MCEJJ plan seeks more flexibility in uses to permit somewhat more development than would be allowed under the relatively more restrictive zoning plan of Option B, it likely that the MCEJJ plan would have effects on local intersections that would fall in severity in between those described for Options B and C.

Showplace Square/Potrero Hill

Of the 15 study intersections in Showplace Square/Potrero Hill, ten intersections are projected to operate at LOS E or F during the weekday p.m. peak hour under Option A, 11 intersections under Option B, and 12 intersections under Option C (see Table 41).

Under Option A, the nine study intersections that are projected to operate at LOS E or F under 2025 No-Project conditions, would continue to operate at unacceptable levels (Seventh/Bryant, Eighth/Bryant, Eight/Harrison, Ninth/Bryant, Tenth/Division/Brannan/Potrero, Division/King/ De Haro, Potrero/16th, Rhode Island/16th, and Rhode Island/Division). With the exception of the intersection of Eighth/Bryant, at the intersections that would operate at LOS E or LOS F under 2025 No-Project conditions, traffic generated by Option A would add vehicles to some movements that determine overall LOS performance. The vehicles added would represent a considerable contribution to the cumulative conditions, and Option A would have a significant cumulative impact on these intersections. Under Option A, p.m. peak hour operations at the intersection of Seventh/Brannan would worsen from LOS D under 2025 No-Project conditions, to LOS F conditions, resulting in a project impact at this location.

Under Option B, the addition of trips associated with new development would result in significant traffic impacts at four study intersections: Seventh/Brannan; Seventh/Townsend; Eighth/Bryant; and Eighth/Harrison Streets. Option B would also increase traffic volumes and vehicle delays at seven study intersections that are projected to operate at LOS E or F under 2025 No-Project conditions (Seventh/Bryant, Ninth/Bryant, Tenth/Division/Brannan/Potrero, Division/King/ De Haro, Potrero/16th, Rhode Island/16th, and Rhode Island/Division). At these intersections, traffic generated by Option B would add vehicles to some movements that determine overall LOS performance, and thus Option B would have a significant cumulative impact on these intersections.

Under Option C, the addition of trips associated with new development would result in significant traffic impacts at five study intersections: Seventh/Brannan; Seventh/Townsend; Eighth/Brannan;

Eighth/Bryant; and Eighth/Harrison Streets. Option C would also increase traffic volumes and vehicle delays at seven study intersections that are projected to operate at LOS E or F under 2025 No-Project conditions (Seventh/Bryant, Ninth/Bryant, Tenth/Division/Brannan/Potrero, Division/King/De Haro, Potrero/16th, Rhode Island/16th, and Rhode Island/Division), resulting in a significant cumulative impact on these intersections.

With the exception of the intersections of De Haro/Division/King, Rhode Island/16th, and Rhode Island/Division Streets, no feasible mitigation measures have been identified to mitigate the above impacts to less-than-significant levels (see Chapter V). Other mitigation measures for the above impacts (see Chapter V), would include implementation Intelligent Traffic Management Systems ("ITMS") strategies, improvement and enhancement of streets, promotion of alternative means of travel, and parking management to discourage driving. However, it is not anticipated that the significant adverse effects at local intersections could be fully mitigated, and thus these remaining impacts are considered significant and unavoidable.

Central Waterfront

Of the eight study intersections in the Central Waterfront, four intersections are projected to operate at LOS E or F during the weekday p.m. peak hour under Option A, five intersections under Option B, and four intersections under Option C (see Table 41). Under all three options, the vehicle trips associated with all three rezoning options would result in worsening of LOS operating conditions to unacceptable levels, and result in significant traffic impacts the following intersections: Third/César Chávez; Third/Evans; César Chávez/Evans; and 25th/Indiana Streets. In addition, under Option B, the intersection of César Chávez/Pennsylvania/I-280 would degrade \to LOS E, resulting in a significant impact. Under Option C, Third/Evans would remain at LOS E (as under 2025 No-Project conditions), however, trips associated with development would represent a considerable contribution to the significant cumulative impacts, and therefore Option C would have a significant cumulative impact at this intersection.

With the exception of the intersection of 25th/Indiana Streets, no feasible mitigation measures have been identified to mitigate the above impacts to less-than-significant levels (see Chapter V). Other mitigation measures for the above impacts (see Chapter V), would include implementation Intelligent Traffic Management Systems ("ITMS") strategies, improvement and enhancement of streets, promotion of alternative means of travel, and parking management to discourage driving. However, it is not anticipated that the significant adverse effects at local intersections could be fully mitigated, and thus these remaining impacts are considered significant and unavoidable.

As such, the project would result in significant effects to intersection levels of service.

Transit

2025 No-Project Scenario

Between 2000 and 2025, the growth in transit trips within the Eastern Neighborhoods and the remainder of San Francisco is anticipated to increase by about 254,000 trips, an increase of about 20 percent over baseline conditions. In the Eastern Neighborhoods, transit trips would make up about 38 percent of the growth in daily travel demand, an increase of almost 28,000 daily transit trips. A portion of this increase in transit demand would be accommodated within the existing service, however, as new development occurs, additional transit service in terms of greater frequency and line extensions and/or new bus lines would be required. Additional support facilities (bus yards) and equipment (buses and light rail vehicles) would also be required.

Under 2025 No-Project conditions, ridership demand at the four Muni screenlines is projected to increase by about 22 percent, while capacity is projected to increase by about 14 percent. While the Northeast screenline would operate below capacity levels, the Northwest, Southwest and Southeast screenlines would operate at more than capacity, and there would be significant transit impacts at these screenlines under 2025 No-Project conditions. Of Muni lines serving the Eastern Neighborhoods, without increases in peak-hour capacity, the majority would exceed Muni's 85 percent threshold at their maximum load points. In particular, ten of the 11 lines serving the Mission, seven of the eight lines serving Showplace Square/Potrero Hill, and two of the three lines serving the Central Waterfront would operate at more than 85 percent capacity in the inbound and/or outbound directions.

Because a number of lines serving the Eastern Neighborhoods have maximum load points outside the Eastern Neighborhoods, overall capacity utilization on many lines would exceed Muni's 85 percent threshold, as is the case under 2000 baseline conditions. Lines where the 85 percent threshold would be newly exceeded under 2025 No-Project conditions include the 10-Townsend, 26-Valencia, 33-Stanyan, 47-Van Ness, and 67-Bernal Heights.

Some non-residential development projects within the Eastern Neighborhoods and the remainder of the city, would be subject to the Transit Impact Development Fee ("TIDF"). The TIDF attempts to recover the cost of carrying additional riders generated by new development by obtaining fees on a square foot basis. TIDF funds may be used to increase revenue service hours reasonably necessary to mitigate the impacts of new non-residential development on public transit. The following uses would be subject to the TIDF program: cultural/institution/education, management, information and professional service, medical and health services, production, distribution and repair, retail/entertainment, and visitor services.

Proposed Project

Proposed Policy Framework

As part of the project, the following policies applicable to transit are proposed. The proposed area plans anticipate that the Planning Department would work together with the Municipal Transportation Agency, which operates Muni, and with other City agencies to improve transit service in the Eastern Neighborhoods study area as part of implementation of the rezoning and area plans. (A complete list of all draft transportation policies for the Eastern Neighborhoods area plans is provided in Appendix B.)

Draft East SoMa Plan

- Objective 4.1: Improve Public Transportation.
- Policy 4.1.1: Improve and expand public transit service linking East SoMa to the rest of the city, in addition to downtown, through cross-town and east-west connections.
- Policy 4.1.2: If the Central Subway is built along the 4th Street corridor, consider placing a stop on 4th Street between Bryant and Brannan.
- Policy 4.1.3: Support innovative transit solutions that improve service, reliability and overall quality of the transit rider's experience.
- Policy 4.1.4: Support the proposed E-line Historic streetcar line.

Draft Mission Plan

- Objective 4.1: Improve public transit to better serve the Mission.
- Policy 4.1.1: The Metropolitan Transit Agency (MTA) should explore improving public transit lines linking the Mission to the rest of the city and Downtown, including cross-town connections.
- Policy 4.1.2: The MTA should explore improvements to 16th Street as a priority transit corridor, connecting the Mission district, Showplace Square/Lower Potrero, and Mission Bay with accompanying pedestrian and landscaping improvements.
- Policy 4.1.3: The MTA should consider east-west transit improvements to better serve the Mission area and improve links to Mission Street transit including BART.
- Policy 4.1.4: Reduce or eliminate curb cuts and vehicular conflicts with transit on Transit Preferential Streets and neighborhood commercial areas, such as Mission, 16th, Valencia, and 24th Streets.
- Policy 4.1.5: As part of the Eastern Neighborhoods Public Benefits Program, consider establishing a fee for residential and commercial developments to fund transit, pedestrian and bicycle improvements in the Mission.
- Policy 4.1.6: Support innovative transit solutions that improve service, reliability and overall quality of the transit rider's experience.

Draft Showplace Square/Potrero Hill Plan

- Objective 3.1: Improve Public Transit To Better Serve Land Use Intensification In Showplace Square.
- Policy 3.1.1: Improve and expand public transit lines linking Showplace to the rest of the city and Downtown, including cross-town connections.

- Policy 3.1.2: The Municipal Transportation Agency (MTA) should explore improvements to 16th Street as a priority transit corridor, connecting the Mission district, Showplace Square/Lower Potrero, and Mission Bay with accompanying pedestrian and landscaping improvements.
- Policy 3.1.3: The MTA should consider north-south transit improvements to better serve the Showplace Square area and mid-SOMA with transit and link them to Market Street, Civic Center, Van Ness and Geary transit corridors.
- Policy 3.1.4: Caltrain and the MTA should pursue grade separation of Caltrain tracks where they cross 16th Street.
- Policy 3.1.5: Reduce or eliminate curb cuts and vehicular conflicts with transit on Transit Preferential Streets, such as 16th Street.
- Policy 3.1.6: Establish a fee for residential and commercial developments to fund transit, pedestrian and bicycle improvements in Showplace.
- Policy 3.1.7: Support innovative transit solutions that improve service, reliability and overall quality of the transit rider's experience.

Draft Central Waterfront Plan

- Objective 3: Knit Access To Public Transit Into The Fabric Of The Neighborhood By Ensuring That New And Existing Rail Transit Services Are Used To Their Full Potential And By Strengthening Other Transit Connections To The Central Waterfront.
- Policy 3.1: Efficiently and effectively link the residents and workers of the Central Waterfront to Third Street Light Rail.
- Policy 3.2: Better integrate the Caltrain Station at 22nd Street into the Central Waterfront through good design.
- Policy 3.3: Improve personal safety at the Caltrain Station, particularly through providing natural surveillance of the platform.
- Policy 3.4: Create better cross-town Muni connections.

Project Impacts

East SoMa

Compared to 2025 No-Project conditions, the three rezoning options would not result in a substantial change in transit trips in East SoMa because most of the proposed changes would involve infill residential development projects. Daily transit trips would increase by about 1 percent for Option A and Option B, and 3 percent for Option C. Because a substantial amount of anticipate new residential development would occur at sites where there are existing non-residential uses, there would be changes in transit usage and travel pattern caused by the changes in land uses in the East SoMa. For those new residents who would take transit to and from work, most would not cross the downtown screenlines because work destinations would tend to be within the greater downtown. (Those riders who did cross a screenline would be traveling in the non-peak direction and there would be sufficient capacity to accommodate this demand.) As under 2025 No-Project conditions, the Northwest, Southwest and Southeast Muni screenlines would operate at more than the capacity utilization standard of 85 percent. While the rezoning options would contribute to increase in future ridership, the increase in transit trips is anticipated

to be low, and the rezoning options would not result in significant contributions to cumulative transit impacts. Some Muni lines operating in downtown may have increased ridership for short sections within the downtown screenline, such as the north-south lines along Second, Third, and Fourth Street corridors. It is also likely that there would also be increases in ridership on the east-west lines in East SoMa, such as the 12-Folsom, 27-Bryant, and 47-Van Ness. Muni modified its routes in the SoMa in 2002 to accommodate prior land use changes in the South of Market, but capacity utilization on these lines would exceed 85 percent at the maximum load point. These routes may require further investigation in terms their adequacy in meeting the demand in the future, such as route structure, hours of service, and service frequencies.

Mission

Under all rezoning options, capacity utilization at most "cordon lines" (screenlines at the subarea boundaries) would remain at less than the 85 percent Muni standard. However, under Option C, at the north and west cordons capacity utilization would exceed 85 percent, and Option C would therefore result in significant impact on Muni operations within the Mission District. (It is noted that there are two BART stations within the Mission District, and BART would likely be used for a portion of the transit trips within San Francisco.)

As substantial portion of transit trips traveling to and from new uses in the Mission District would be expected to start or end outside of the Mission, which could result in increased ridership demand at the maximum load point. As indicated above, under 2025 No-Project conditions Muni's northwest, southwest, and southeast screenlines would operate at more than the capacity utilization standard of 85 percent, resulting in significant transit impacts at these screenlines under No Project conditions. Each of the rezoning options (and particularly Option C, which would have three times the increase in transit trips than Option A and Option B), would be expected to increase ridership levels at the maximum load point, and would result in significant impacts on Muni operations at the maximum load points.

For the reasons set forth above under Traffic, the *People's Plan* would likely that the *People's Plan* would have effects on transit that would fall in severity in between those described for Options A and B, while the MCEJJ plan would have effects on transit that would fall in severity in between those described for Options B and C.

Showplace Square/Potrero Hill

Under all rezoning options, capacity utilization at the subarea cordon lines would remain at less than the 85 percent standard. The highest level of capacity utilization would be at the northern boundary (which includes the 9-San Bruno, 19-Polk, 33-Stanyan and 47-Van Ness), where the outbound cordon would operate at 77 percent capacity utilization. The south and west cordons would operate at an overall capacity utilization of less than 70 percent, while the east cordon would operate at substantially lower levels. Since capacity utilization would not exceed the Muni standard of 85 percent, the rezoning options would not result in significant impact on Muni

operations within Showplace Square/Potrero Hill. It should be noted, however, that the maximum load point on the 9-San Bruno is at 16th/Potrero, and under 2025 No-Project and Project Options, the weekday p.m. peak hour capacity utilization would exceed 85 percent. However, other, potentially less frequent and less direct lines, would have available capacity to accommodate additional passengers.

As with the Mission District, a substantial portion of transit trips traveling to and from new uses in Showplace Square/Potrero Hill would be expected to start or end outside of the Showplace Square/Potrero Hill, which could result in increased ridership demand at the maximum load point on the lines that serve Showplace Square/Potrero Hill. Because Muni's northwest, southwest, and southeast screenlines would operate at more than the capacity utilization standard of 85 percent under 2025 No-Project conditions, each of the rezoning options would be expected increase ridership levels at the maximum load point, and thus would result in significant impacts on Muni operations at the maximum load points.

Central Waterfront

Options B and C are anticipated to result in minimal increases in transit demand. Option A, however, would result in substantial increases in transit demand, as this option includes 2,500 housing units proposed as part of a potential future reuse of the Potrero Power Plant site. Nevertheless, under all rezoning options, capacity utilization at the subarea cordon lines would remain at less than the 85 percent standard. This analysis assumes that the T-Third would provide two-car service between downtown and the 19th Street turnback, which would accommodate the future No-Project Alternative and project option growth at the cordon. However, under Option A, the 2,500 residential units at the Potrero Power Plant site would be located south of 19th Street, where one-car train service would be provided. As a result, capacity utilization result in significant impacts at the north cordon. Under Option B and Option C, the rezoning would not add a significant number of riders to this cordon, and therefore the contribution of the rezoning option to this 2025 No Project impact would not be significant.

As with the Mission District and Showplace Square/Potrero Hill, a substantial portion of transit trips traveling to and from new uses in the Central Waterfront would be expected to start or end outside of the Showplace Square/Potrero Hill, which could result in increased ridership demand at the maximum load point on the lines that serve Showplace Square/Potrero Hill. Because Muni's northwest, southwest, and southeast screenlines would operate at more than the capacity utilization standard of 85 percent under 2025 No-Project conditions, each of the rezoning options would be expected increase ridership levels at the maximum load point, and thus would result in significant impacts on Muni operations at the maximum load points.

Conclusion and Mitigation

Based upon the change from 2025 No-Project conditions, increases in transit ridership under the No-Project Alternative would result in significant impacts on Muni service affecting lines 9, 10,

12, 14, 22, 26, 27, 47, 49, and 67. Each of the proposed rezoning options would also contribute, along with background (No-Project) growth, to significant cumulative impacts on Muni lines, with Option A significantly affecting two lines, Option B, three lines, and Option C, seven lines. Change in capacity utilization are summarized, by alternative, in **Table 42**.

Mitigation identified in Chapter V would necessitate the identification of new funding source(s), to supplement the City's Transit Impact Development Fee program for non-residential uses, to enable Muni to accommodate projected transit demand within the Eastern Neighborhoods and the remainder of the City, including meeting capital needs such as bus storage. Additionally, further mitigation identified in Chapter V would include additional and enhanced Muni service, transit priority on certain streets, improvement of transportation demand management, establishment of a coordinated planning process to link land use planning and development in the Eastern Neighborhoods to transit and other alternative transportation mode planning in the eastern portion of the City. However, it is not anticipated that the significant adverse effects on Muni service could be fully mitigated, and therefore the project's effect on Muni service is considered to be a potentially significant impact.

TABLE 42
EFFECTS ON MUNI SERVICE

	Capacity Utilization (Inbound/Outbound), PM Peak Hour, at Maximum Load Point				
Route	**Baseline (2000)**	**2025 No-Project**	**Option A**	**Option B**	**Option C**
9-San Bruno	**94% / 110%**	**120% / 151%**	**134% / 151%**	**135% / 149%**	**148% / 165**%
10-Townsend	20% / 56%	26% / **134%**	28% / **134%**	27% **/ 133%**	28% / **134%**
12-Folsom	**94%** / 30%	**109%** / 42%	**112% /** 42%	**113%** / 41%	**120%** / 52%
14-Mission	47% / **86%**	60% / **113%**	62% / **113%**	63% / **112%**	69% / **122%**
T-Third/15-Third [1]	62% / 71%	35% / 61%	42% / 61%	35% / 52%	36% / 51%
19-Polk	47% / 47%	55% / 59%	63% / 59%	62% / 58%	63% / 61%
22-Fillmore	82% / **85%**	**95% / 102%**	**98% / 102%**	**100% / 101%**	**107% / 109%**
26-Valencia	26% / 76%	33% **/ 89%**	33% **/ 89%**	33% / **90%**	35% / **94%**
27-Bryant	**86%** / 57%	**111%** / 78%	**118%** / 78%	**119%** / 77%	**126%** / 84%
33-Stanyan	68% / 56%	**87%** / 74%	**89%** / 74%	**91%** / 73%	**97%** / 81%
47-Van Ness	74% / 50%	**86%** / 61%	**89%** / 61%	**88%** / 61%	**89%** / 63%
48-Quintara	**87%** / 72%	**112% / 94%**	**113% / 94%**	**115% / 93**%	**119% / 100%**
49-Van Ness-Mission	73% / 93%	**85% / 112**%	**89% / 112**%	**91% / 111%**	**100% / 121%**
53-Southern Heights	27% / 31%	34% / 44%	35% / 44%	35% / 43%	37% / 48%
67-Bernal Heights	67% / 68%	**86% / 88%**	**87% / 88%**	**87% / 88%**	**88% / 88%**

NOTES: **Bold-face** text indicates capacity at or in excess of Muni's 85 percent standard, box indicates significant impact. (Express routes not included.)

[1] T-Third assumes two-car trains to 19th Street during the weekday p.m. peak hour analysis period. T-Third light rail line replaced the 15-Third bus line in April 2007.

SOURCE: CHS Consulting, LCW Consulting, June 2007.

Pedestrian and Bicycle Conditions

2025 No-Project Scenario

Pedestrians

Under 2025 No-Project conditions, growth in walking and bicycle trips is projected to represent about 14 percent of the growth in daily person trips within the four neighborhoods (an increase of about 25,900 daily walk and bike trips). Given the low to moderate levels of baseline pedestrian activity within most of the Eastern Neighborhoods, the anticipated increase in pedestrian traffic would be accommodated by existing sidewalks.

As noted in the Setting, East SoMa lacks sidewalks along portions Townsend Street and some of the smaller mid-block streets. Within the Mission District, deficiencies in the sidewalk network are limited to the industrial area north of 20th Street between Potrero Avenue and Folsom Street. In the Showplace Square/Potrero subarea, sidewalks are lacking primarily in Showplace Square north of 16th Street; however, sidewalk deficiencies also exist on limited segments to the south of 16th Street (e.g., on Carolina Street). Deficiencies in the sidewalk network are most pronounced in the Central Waterfront, where many streets do not have sidewalks. Pedestrian conditions in Showplace Square and the Central Waterfront are further affected by vehicles parking on sidewalks, adjacent to building, and double parking.

Under 2025 No-Project conditions, some of the sidewalk deficiencies would be eliminated as a result of individual development projects and potentially as part of larger planned improvements such as the proposed extension of Caltrain to downtown, which would reconstruct the Townsend Street right-of-way. Further improvements to the pedestrian infrastructure (such as crosswalks and pedestrian signals) would be implemented in response to requirements part of individual development projects. Additionally, as noted in Section IV.B, Plans and Policies, the City is currently developing a Better Streets Plan, including the Streetscape Master Plan (SMP) and the Pedestrian Transportation Master Plan (PMP), with a goal of improving the pedestrian environment.

Development within the Eastern Neighborhoods under 2025 No-Project conditions would result in an increase in pedestrian, bicycle and vehicle trips in the four neighborhoods, with the potential for pedestrian-vehicle conflicts, and a resultant increase in pedestrian injury collisions. For example, continued development within the Mission Bay area would increase traffic volumes on 16th Street, thereby reducing gaps for pedestrians to cross 16th Street at intersections where only the side streets are STOP-sign controlled. Community-supported planning efforts would need to occur to identify specific improvements to enhance pedestrian travel and safety in the Eastern Neighborhoods. The *Southeast Mission Pedestrian Safety Plan* is one example of such an effort conducted as part of Municipal Transportation Agency's Livable Streets program, and includes location-specific pedestrian improvements such as bulb outs, ladder crosswalks, pedestrian countdown signals, and red-light photo-enforcement cameras. Once a program of specific

improvements within the four neighborhoods are identified, the City's Proposition K transportation sales tax funding, and regional and federal grant funding could be pursued by MTA to implement these projects.

Bicycles

New bicycle trips under 2025 No-Project Conditions would use the existing and planned system of bicycle routes. Individual development projects would be required to comply with provisions of the Planning Code pertaining to bicycle parking spaces in off-street parking facilities, and other support facilities, such as showers and lockers.

The draft *2005 Bicycle Plan* (currently undergoing environmental review) identifies 13 streets and corridors within the Eastern Neighborhoods where bicycle lanes are being proposed. These include Second Street, Fifth Street and Townsend Street in East SoMa; 14th Street, the 16th/17th Streets corridor, the César Chávez/26th Streets corridor, and Potrero Avenue in the Mission; the 16th/17th Streets corridor, 23rd Street, Division Street, Mississippi Street, Kansas Street, and Potrero Avenue in Showplace Square/Potrero Hill; and Illinois Street and César Chávez Street in the Central Waterfront. Implementation of these improvements would depend on availability of funding, and priority of project within the overall list of citywide bicycle route improvements. However, bicycle lane improvements on Second, Fifth, Townsend, César Chávez, 17th, and Illinois Streets were identified as part of the 20 priority projects in the *2005 Bicycle Plan*, and therefore implementation of these improvements are anticipated to occur in the near term.

Proposed Project

Proposed Policy Framework

As part of the project, the following policies applicable to pedestrian and bicycle are proposed. The proposed area plans anticipate that the Planning Department would work together with the Municipal Transportation Agency, which includes the Department of Parking and Traffic, and with other City agencies to improve pedestrian and bicycle conditions in the Eastern Neighborhoods study area as part of implementation of the rezoning and area plans.

Draft East SoMa Plan

- Objective 4.5: Promote And Improve Infrastructure For Bicycling And Walking As Important Modes Of Transportation.
- Policy 4.5.1: Establish East SoMa's linkages with the citywide bicycle network to ensure a comprehensive system of safe, convenient and attractive routes for all travel needs.
- Policy 4.5.2: Provide quality bicycle parking, particularly at transit stops, outside stores, and near concentrations of employment.
- Policy 4.5.3: Require alleys that break up the scale of large-scale projects and allow additional access to buildings in the project.
- Policy 4.5.4: Prohibit the vacation or sale of streets or alleys.

- Policy 4.5.5: Consider implementing pedestrian improvements especially near freeway on- and off-ramps.
- Policy 4.5.6: Consider mid-block crosswalks on long east-west SoMa blocks.
- Objective 4.7: Design Streets That Reflect Their Role As An Important Part Of Civic Space And For Multiple Users And Means Of Travel.
- Policy 4.7.1: Consider transforming Folsom Street, from the Bay waterfront to the Mission District into a civic boulevard through the heart of South of Market with priority bus transit treatments and significant pedestrian improvements.
- Policy 4.7.2: Consider transforming Howard Street into a neighborhood-oriented street with calm traffic and bicycle improvements and pedestrian improvements.
- Policy 4.7.3: Consider improvements to 2nd Street as an important pedestrian corridor and commercial street, as well as for bicycles and transit, connecting the ballpark area to downtown.
- Policy 4.7.4: Explore improvements to 3rd and 4th Streets through South of Market as important pedestrian corridors connecting Mission Bay to downtown.
- Policy 4.7.5: Consider north-south transit improvements in the 7th/8th Street corridor to better serve the Showplace Square area and mid-SOMA with transit and link them to Market Street, Civic Center, Van Ness and Geary transit corridors.

Draft Mission Plan

- Objective 4.4: Promote bicycle use as an alternative to the automobile.
- Policy 4.4.1: Improve and expand neighborhood bicycle routes within the Mission, as well as connections with the citywide bicycle network, to ensure a comprehensive system of safe convenient and attractive routes.
- Policy 4.4.2: Improve the 16th Street corridor within the Mission and its connections to the Castro and Showplace Square.
- Policy 4.4.3: Explore bicycle improvements on Folsom and Potrero Streets to create a north-south bicycle route to serve the Mission and that connects to SoMa.
- Policy 4.4.5: Provide quality bicycle parking, particularly at transit stops, outside stores, and near concentrations of employment.

Draft Showplace Square/Potrero Hill Plan

- Objective 3.3: Design Streets And Enhance The Street Network To Encourage Walking And Ensure Pedestrian Safety.
- Policy 3.3.1: Create safe and pleasant pedestrian networks that link Showplace Square to adjacent neighborhoods.
- Policy 3.3.2: Improve streets for pedestrian access and safety.
- Policy 3.3.3: Introduce traffic-calming measures and other improvements where appropriate.
- Policy 3.3.4: Require private developers to include alleys that break up the scale of large-scale projects and to facilitate service access to buildings away from key transit or pedestrian streets.
- Policy 3.3.5: Require private developers to contribute to the creation and maintenance of improved streetscapes through in-kind contribution, a community facilities district and/or developer fees.

- Policy 3.3.6: Pursue additional street or pedestrian connections to Mission Bay between 16th Street and Commons Street.
- Objective 3.6: Promote Bicycle Use As An Alternative To The Automobile.
- Policy 3.6.1: Improve and expand neighborhood bicycle routes within the area and connections with the citywide bicycle network to ensure a comprehensive system of safe, convenient and attractive routes.
- Policy 3.6.2: Improve the 16th/17th Street corridor within the area and its connections to the Mission District and Mission Bay.
- Policy 3.6.3: The MTA should explore bicycle improvements on Henry Adams or Rhode Island Streets to create a north-south bicycle route to serve the heart of Showplace Square and that connects to 8th Street.
- Policy 3.6.4: The MTA should consider improving bicycle connections to Mission Bay and support the Mission Creek Bikeway project.
- Policy 3.6.5: Provide quality bicycle parking, particularly at transit stops, outside stores, and near concentrations of employment.

Draft Central Waterfront Plan

- Objective 2: Design Streets That Reflect Their Role As An Important Part Of Civic Space And For Multiple Users And Means Of Travel.
- Policy 2.1: Treat streets as an important part of the public open space system.
- Policy 2.2: Design streets for a variety of users.
- Policy 2.3: Ensure provisions for safe and enjoyable pedestrian travel throughout the neighborhood by employing innovative street design.
- Policy 2.4: Support pedestrians by encouraging the development of an active streetfront.
- Policy 2.5: Clearly mark the Bay Trail where it passes through the Central Waterfront and move it closer to the Bay as opportunities become available.
- Policy 2.6: Encourage CalTrans to improve the 18th and 20th Street bridges over I-280 for better pedestrian access between the Potrero Hill neighborhood and the Central Waterfront.
- Policy 2.7: Encourage pedestrian activity by creating a better physical environment for walking.
- Objective 4: Promote Travel By Bicycle By Providing A Safe, Convenient, And Attractive Network Of Routes.
- Policy 4.1: Extend and rebuild the street grid.
- Policy 4.2: Provide quality bicycle parking, particularly at transit stops, outside stores, near concentrations of employment, and in new housing developments.
- Policy 4.3: Complete the pieces of the San Francisco bicycle network that are within the Central Waterfront. The primary goal is to create a safe, attractive north-south bicycle route from the Bayview/Hunters Point to downtown San Francisco.
- Policy 4.4: Complete connections to the bicycle network north and south of the Central Waterfront.
- Policy 4.5: Pursue construction of a bicycle and pedestrian bridge over Islais Creek.

Project Impacts

In general, the analysis of pedestrian and bicycle impacts are specific to individual development projects, and would include a discussion of the anticipated number of pedestrian and bicycle trips that would be generated during the weekday p.m. peak hour, the existing and proposed width of the adjacent sidewalks, the existing and planned bicycle routes/lanes in the area, a comparison of proposed bicycle parking spaces to the Planning Code requirements, and an assessment of potential safety concerns and conflict locations. As such, separate pedestrian and bicycle impact analyses would need to be conducted for future development projects in the Eastern Neighborhoods study area.

Individual development projects would make localized sidewalk improvements and improvements to reduce pedestrian-vehicle and bicycle conflicts. However, such development projects would typically be required to improve site-specific conditions, and would not be required to improve systemwide or areawide deficiencies. The San Francisco Department of Public Works and Municipal Transportation Agency (MTA) would be responsible for the systemwide or areawide deficiencies. Both of these departments have ongoing pedestrian improvements projects, such as installation of pedestrian signal heads and pedestrian countdown timers. Other improvements that could be implemented by these two agencies include crosswalk improvements, corner bulb-outs, pedestrian-scale lighting and decorative pavement. Additional funding for the systemwide or areawide improvements would likely be sought.

New bicycle trips resulting from development subsequent to implementation of the proposed rezoning and area plans would use the existing and planned system of bicycle routes. Individual development projects would be required to comply with provisions of the Planning Code pertaining to bicycle parking spaces in off-street parking facilities, and other support facilities, such as showers and lockers.

Pedestrian Safety

Increases in pedestrian, bicycle and vehicle trips associated with new development would result in an increase in the potential for pedestrian-bicycle-vehicle conflicts. Community-supported planning efforts would need to occur to identify specific improvements to enhance pedestrian travel and safety in the Eastern Neighborhoods. These planning efforts (e.g., the *Southeast Mission Pedestrian Safety Plan*) would include a combination of traffic engineering, pedestrian safety, and traffic calming strategies to enhance pedestrian travel and safety. Examples of measures could include:

- bulbouts
- ladder crosswalks
- pedestrian signals
- pedestrian countdown/audible signals
- red-light enforcement cameras

- intersection vehicle and pedestrian controls
- intersection/roadway geometry changes (e.g., narrow travel lanes)
- pedestrian scale lighting

- In addition, strategies to reduce traffic volumes, including trip-reduction strategies proposed as mitigation measures in Chapter V, would be expected to have beneficial effects in regard to pedestrian hazards.

The individual plans for the four Eastern Neighborhoods include objectives and policies that would serve to encourage travel by public transit, and other non-auto modes, and would enhance pedestrian travel and safety. In addition, all three rezoning options would include changes to the Planning Code parking requirements for residential and non-residential uses, to eliminate minimum parking supply requirements, and instead specify maximum permitted parking supply (the existing Planning Code requirements currently require the provision of car-sharing spaces). Chapter V identifies improvement measures for pedestrians, as well as mitigation and improvement measures for traffic and transit, which, if implemented, would be expected to improve pedestrian safety in the Eastern Neighborhoods.

San Francisco Department of Public Health Pedestrian Injury Model – The San Francisco Department of Public Health ("DPH") has analyzed pedestrian injuries in traffic accidents a public health perspective. DPH notes that traffic accidents in general are a leading cause of death and injury in the United States, and that pedestrians represented 12 percent of all fatalities in motor vehicle accidents in 2005. Beyond direct injuries and deaths, as matter of public health, DPH states that increased pedestrian safety can encourage walking, which in turn can have direct health benefits such as reducing obesity and indirect benefits such as improved air quality resulting from lesser traffic volumes.

According to data prepared by DPH, the four Eastern Neighborhoods have a substantially greater rate of pedestrian injury collisions, on a population-weighted basis, than does the City as a whole: whereas the number of accidents involving pedestrian injury citywide is approximately 100 per 100,000 population, the comparable rates in the Eastern Neighborhoods range from approximately 150 per 100,000 population in the Mission District to approximately 415 per 100,000 population in East SoMa. The rate in the Central Waterfront is approximately 170 per 100,000 population, while in Showplace Square/Potrero Hill, it is about 240 per 100,000 population.[117]

San Francisco as a whole has a substantially greater number of pedestrian injury accidents on a population-weighted basis than the national average, largely because there is much more pedestrian activity than most comparably-sized cities. The average rate of pedestrian injuries and

[117] The Mission District had the greatest total number of accidents of the four neighborhoods, 93 per year over a five-year period analyzed, but because this neighborhood has by far the greatest population of the four Eastern Neighborhoods, its rate of accidents per population is lower. The very high rate in the Central Waterfront is reflective, in part, of the very low resident population: much of the daily activity in this neighborhood is commercial activity by workers and employers, whose numbers are not counted in the "population" that is the basis of the accident rate. This neighborhood had by far the lowest total number of accidents, about nine per year. In East SoMa, the number of accidents is 82 per year, while for Showplace Square/Potrero Hill, it was about 57 per year. All accident rates are based on census tract population, which does not correlate precisely with the boundaries of the four Eastern Neighborhoods, and thus should be considered order-of-magnitude figures.

fatalities in California as a whole is 40 per 100,000 based on 2005 data from the California Highway Patrol. In part, the city's pedestrian injury rate of 104 per 100,000 residents reflects a higher level of pedestrian activity than most comparably sized cities; however, DPH and other research s indicate that this explains only a part of the difference. Based on analysis of data from 68 California cities, the effect of pedestrian activity in San Francisco on the relative pedestrian injury rate can be estimated by the relationship that the number of pedestrian collisions increases at approximately 0.4 power of the number of people walking to work.[118] Using this empirically derived relationship and publicly-available data from the U.S. Census on the proportion of

- workers walking to work in California (2.9 percent) and in San Francisco (9.4 percent), one would expect San Francisco to have about 1.6 times more pedestrian collisions than comparable cities (i.e., $((9.4/2.9)^{0.4}$=160 percent). This adjustment also shows that while 60 percent more collisions per resident (a rate of 64 per 100,000) may be expected based on greater pedestrian activity, the degree of pedestrian activity does not fully account for the high rate of collisions in parts of the City, particularly in the Eastern Neighborhoods. San Francisco's relatively high rate of collisions may also be influenced by the increased exposure associated with a 50 percent increase in its daytime population relative to its resident population due to an influx
- of commuters into its job centers, although the injury model identified no statistically significant correlation between injuries and the number of workers per census tract.

Among the five intersections in San Francisco where 10 or more vehicle-pedestrian collisions occurred during the period from 2001-2005, four are in the study area: 16th/Potrero (14 collisions), 16th/Mission (13 collisions), 18th/Mission (10 collisions), and Sixth/Mission (10 collisions).[119] In general, the number of pedestrian injury collisions citywide (including fatalities) has declined over the last 10 years, from 1,035 in 1996 to 718 in 2005.[120] Based on previous San Francisco research,[121] the influence of alcohol or substance abuse may be contributing factors to high numbers of pedestrian collisions at the 16th/Mission, 18th/Mission and Sixth/Mission locations.

There are a number of factors that contribute to increased pedestrian-vehicle collisions, and the number of collisions at an intersection is a function of the traffic volume, travel speeds, intersection configuration, traffic control, surrounding land uses, location, and number of pedestrians. DPH has developed a "pedestrian injury model" that attempts to predict the change in accidents involving pedestrian injury on the basis of a number of different factors, including vehicular traffic volume, resident population, proportion of occupied housing units without auto access,[122] proportion of the population that uses transit to travel to and from work, proportion of arterial streets without Muni access in the neighborhood, and land area of the neighborhood.

[118] Jacobsen PL. Safety in numbers: more walkers and bicyclists, safer walking and bicycling. Injury Prevention Sep;9(3):205-9. This relationship between injuries and the proportion walking to work can be summarized with the following equation: % change in injury = (% change in walking)$^{0.4.}$
[119] Department of Parking and Traffic, *San Francisco 2005 Collision Report*, July 19, 2006; Table 6.
[120] Department of Parking and Traffic, *San Francisco 2005 Collision Report*, July 19, 2006; Figures 3 and 4.
[121] LaScala, EA, Gerber D, and Gruenewald PJ, Demographic and environmental correlates of pedestrian injury collisions: a spatial analyais. Accident Analysis & Prevention 2000 (32): 651-658.
[122] Units that do not have access to at least one automobile tend to be more reliant on pedestrian travel.

Based on this model, DPH projects that the number of pedestrian injury collisions in the project area could increase, from 2000 conditions, by between 14 and 24 percent by 2025 with implementation of the proposed rezoning and community plans (under Option B). The greatest percentage increase would be in the Central Waterfront (24 percent), largely because of the relatively few existing accidents, while the smallest percentage increase would be in the Mission (14 percent), which would also see the smallest relative increase in population because this neighborhood has the largest existing population. The rate of increase in Showplace Square/Potrero Hill would be 21 percent, and in East SoMa it would be 20 percent. For the Eastern Neighborhoods as a whole, the predicted increase in pedestrian injury accidents under Option B, according to the DPH model, would be 17 percent, or essentially the same as the 16 percent increase in residential population under Option B.

Under current conditions, all neighborhoods affected by neighborhood plans currently have high annual population-based rates of pedestrian injury collisions (ranging from 170 per 100,000 residents in the Central Waterfront, to 410 per 100,000 in East SoMa – compared to a much lower citywide average rate of 100 per 100,000 residents. Based on the DPH model, the number of accidents involving pedestrian injury would increase throughout the project area. This result is consistent with what would be anticipated with an increase in both vehicle traffic and population (and thus residents) throughout the study area. The outcome predicted by the DPH model may, however, be tempered by the influence of "safety in numbers" in a number of the Eastern Neighborhoods, presently characterized by low volumes of pedestrians in industrial settings, as increases in the numbers of both residents and pedestrians have the effect that drivers exercise more care when they expect to and see many pedestrians than when they see few pedestrians.

As indicated above, the number of pedestrian collisions at an intersection is a function of the traffic volume, travel speed, intersection configuration, traffic control, surrounding land uses, location, and number of pedestrians. The DPH pedestrian injury model is one approach to evaluating pedestrian hazards, and is intended to compliment more traditional methods of pedestrian hazards analysis. The DPH employs a health risk assessment analytic approach to the presentation of existing areawide conditions and the forecasting of areawide trends that focuses on area-level factors such as traffic volumes and population. It differs from the traditional traffic engineering approach to accident analysis, which is focused more closely on specific locations; that is, traffic engineers tend to examine specific locations (generally, intersections) where a relatively large number of accidents are noted and to examine potential operational solutions (e.g., installation of new traffic signals, signal re-timing, sidewalk widening (bulbouts), and the like) in an effort to alleviate site-specific traffic hazards. The traditional approach also goes beyond a simple compilation of accident volumes to include a detailed examination of the causes of accidents at specific locations.

Because the City of San Francisco has not established criterion of significance and has not thoroughly evaluated various analysis tools for pedestrian injury collisions, it cannot be

concluded that the proposed project would result in a significant effect with regard to pedestrian conditions.

East SoMa

Pedestrians

The increase in pedestrian trips is projected to be similar between the rezoning options, with the greatest increase projected to occur under Option C. Including cumulative (2025 No-Project) growth, East SoMa would experience the greatest overall increase in pedestrian trips, from baseline conditions, among the four neighborhoods. Trips to and from transit stops, and to and from parking facilities would result in an increase in pedestrian volumes on the study area sidewalks. Increases in pedestrian volumes would be most noticeable in the immediate vicinity of subsequent individual development projects. Because all three rezoning options would result in an increase in housing units in East SoMa, pedestrian activities during the night-time and overnight hours would be expected to increase, as well.

Since baseline pedestrian volumes within East SoMa are relatively low, the character of interactions between pedestrians and vehicles may change substantially. Currently, there are high volumes of vehicles and relatively high number of collisions between vehicles and pedestrians even though the number of pedestrians is relatively low. With increased residential development, increases in the number of pedestrian would likely outpace the substantial increases in the number of vehicles in the area. For future conditions, the amount of conflicts between pedestrians and vehicles would likely increase, but the presence of increased number of pedestrians may also affect driver behavior. New residential settings coupled with substantial increases in foot traffic may partially offset risks associated with increased pedestrian-vehicle conflicts, as “safety in numbers” causes drivers to expect and adapt to increased interactions with pedestrians. The addition of pedestrian trips associated with the rezoning options would likely change the character of the area’s pedestrian environment, but would not be expected to significantly affect baseline pedestrian conditions. While the addition of vehicle trips associated with the rezoning options would increase the potential for pedestrian-vehicle conflicts, traffic engineering, pedestrian safety, and traffic calming strategies to enhance pedestrian travel are included in improvement measures in Chapter V. The Draft East SoMa Plan contains objectives and policies that would serve to encourage travel by public transit and other non-auto modes, and enhance pedestrian travel and safety within East SoMa.

Bicycles

Because the baseline bicycle volumes on these routes are relatively low, it is not expected that the added bicycle trips would cause significant bicycle impacts. However, depending on the design of the new development projects, there may be added conflicts with garage access along these bicycle routes.

As indicated above under Planned Transportation Improvements, the *2005 Bicycle Plan* proposes implementing bicycle lanes on Second, Fifth and Townsend Streets, and has identified these projects as part of the 20 priority projects. The implementation of a bicycle lanes on Second (between Market and King Streets) for Route #11, and on Fifth Street (between Market and Townsend Streets) for Route #19 would require removing one to two travel lanes. The implementation of bicycle lanes on Townsend Street for Route #36 could be achieved by reducing travel lanes, changing 90-degree angle parking to parallel parking, or by eliminating a travel lane and providing a two-way center turn lane. These projects are currently undergoing environmental review. With implementation of bicycle lanes on these routes, all designated bicycle routes in the East SoMa neighborhood would have exclusive bicycle lanes.

Mission

Pedestrians

Option C, which would result in a substantial increase in housing units and employment, as compared to Options A and B, would have the greatest increase in pedestrian trips (an increase of 20 percent from 2025 No-Project conditions, as compared to an increase of 5 percent for Option A, and 7 percent for Option B). Under all rezoning options, increases in pedestrian volumes would occur throughout the Mission. Under Option C, there would be greater increases in pedestrian volumes in the northeast and southern portions of the neighborhood, and along the Mission Street corridor. Of the four study neighborhoods, the Mission would experience the greatest increase in pedestrian activity due to the proposed project, although the overall increase from baseline conditions—primarily due to other, cumulative, development would be greatest in East SoMa. The addition of vehicle trips associated with development with each rezoning option would increase the potential for pedestrian-vehicle conflicts. Individual development projects would address pedestrian conditions, and include improvements to address localized deficiencies and pedestrian-vehicle conflicts. Pedestrian-related amenities that could be considered include sidewalk and crosswalk widening, corner bulbing, pedestrian signal heads and countdowns, pedestrian-scale lighting, and decorative pavement.

Several streets in this subarea, such as Potrero Avenue, South Van Ness Avenue and César Chávez Street, are major arterials with higher vehicular travel speeds. Improvements associated with individual development projects could contribute to implementation of needs assessments conducted by the MTA, such as the *Southeast Mission Pedestrian Safety Plan*. This plan was developed by the MTA and the Department of Public Health in 2003 for the rectangle of streets bounded by Potrero Avenue, César Chávez Street, 24th Street and Mission Streets. Improvements identified for implementation included bulb-outs, ladder crosswalks, pedestrian countdown signals, and red-light photo-enforcement cameras.

Bicycles

There is a good network of bicycle routes serving this subarea, described above in the Setting, and because the baseline bicycle volumes on these routes are relatively low, it is not expected that the added bicycle trips would cause significant impacts on these bicycle routes. However, depending on the design of the new development projects, there may be added conflicts with garage access along these bicycle routes. In addition, the projected increase in traffic volumes within the Mission District would result, particularly under Option C, in increased bicycle and vehicle conflicts.

As indicated above under Planned Transportation Improvements, the *2005 Bicycle Plan* proposes implementing bicycle lanes on the 16th/17th Streets and César Chávez/26th Streets corridors, and on Potrero Avenue south of 25th Street and north of 17th Street. Bicycle lanes on the 16th/17th Streets and César Chávez/26th Streets corridors were identified as part of the 20 priority projects in the *2005 Bicycle Plan.* Due to constraints with providing within these corridors, full corridor studies were recommended to determine the most appropriate bicycle improvements for the corridor. These projects are currently undergoing environmental review. The provision of a bicycle lane on 14th Street between Market and Dolores Streets has recently been implemented, although this project requires environmental review clearance.

Because neither the *People's Plan* nor the MCEJJ plan would result in land uses or development patterns that would differ markedly from those under the proposed project rezoning options, these two variants would have effects on pedestrian and bicycle circulation that would be similar to those of the proposed project.

Showplace Square/Potrero Hill

Pedestrians

The increase in pedestrian trips relative to 2025 No-Project conditions is projected to be similar between Option A and Option B (a 17 percent and a 20 percent increase from 2025 No-Project, respectively), and the increase under Option C would be somewhat higher (a 30 percent increase). Trips to and from the transit stops, and to and from parking facilities would result in an increase in pedestrian volumes on the study area sidewalks. Increases in pedestrian volumes would be most noticeable in the immediate vicinity of the individual development projects. Because all rezoning options would result in an increase in housing units in Showplace Square, pedestrian activities during the night-time and overnight hours within this subarea would be expected to increase, as well.

Because baseline pedestrian volumes within the Showplace Square/Potrero Hill neighborhood are relatively low, the addition of pedestrian trips associated with the rezoning options would not substantially affect baseline pedestrian operating conditions. However, the addition of vehicle trips and pedestrian trips associated with the rezoning options would increase the potential for pedestrian-vehicle conflicts and collisions, particularly because several streets in this subarea,

such as 16th Street, are major arterials with higher vehicular travel speeds. Pedestrians crossing 16th Street experience difficulty due to the high traffic volumes along 16th Street and the lack of marked crosswalks and pedestrian signals.

Bicycles

There is a good network of bicycle routes serving Showplace Square/Potrero Hill, described above in the Setting, and the Bicycle Plan proposes additional improvements. Because the baseline bicycle volumes on these routes are relatively low, it is not expected that the added bicycle trips would cause significant impacts on these bicycle routes. However, depending on the design of the new development projects, there may be added conflicts with garage access along these bicycle routes.

As indicated above under Planned Transportation Improvements, the *2005 Bicycle Plan* proposes implementing bicycle lanes on 16th/17th Street corridor, 23rd Street, Division Street, Mississippi Street, and on Potrero Avenue. Bicycle lanes on the 16th/17th Street corridor were identified as part of the 20 priority projects in the 2005 Bicycle Plan. These projects are currently undergoing environmental review.

Central Waterfront

Pedestrians

Of the four neighborhoods, the Central Waterfront would generally have the least amount of growth in pedestrian travel. The increase in pedestrian trips within the Central Waterfront relative to 2025 No-Project conditions is projected to be similar between Option B and Option C (about a 23 percent increase from 2025 No-Project conditions), and the increase under Option A would be substantially higher (an 89 percent increase). Option A includes the 2,500 housing units proposed within the Potrero Power Plant site, and this development would be the primary generator of pedestrian trips. The primary pedestrian direction of travel would be between the Potrero Power Plant site and the light rail service on Third Street. Pedestrian levels within the Central Waterfront currently are low, and the development associated with the rezoning options would increase pedestrian presence in the neighborhood.

Since baseline pedestrian volumes within the Central Waterfront are low, the addition of pedestrian trips associated with the rezoning options would not substantially affect baseline pedestrian operating conditions. The addition of vehicle trips associated with the rezoning options would increase the potential for pedestrian-vehicle conflicts, particularly in locations where the sidewalk network is incomplete and where vehicles park on the sidewalks, causing pedestrians to walk in the roadway and mix with vehicle traffic, and contributing to lack of visibility that contributes to pedestrian-vehicle conflicts. While the presence of an increased number of pedestrians may partially offset risks associated with increased pedestrian-vehicle conflicts, as “safety in numbers” causes drivers to expect and adapt to increased interactions with pedestrians,

measures to safely accommodate pedestrians, bicyclists and vehicles would need to be made. Within the industrial areas of the Central Waterfront, improvements such as provision of sidewalks and curbs, on-street parking, stop bars at approaches to intersections, street lighting, and refurbishment of roadway markings would serve to improve pedestrian travel in the area. A community-supported planning effort similar to the *Southeast Mission Pedestrian Safety Plan* that would include the Third Street corridor, as well as the industrial areas to the west, could identify specific improvements to enhance pedestrian travel and safety in the Central Waterfront.

Bicycles

As indicated above under Planned Transportation Improvements, the *2005 Bicycle Plan* proposes implementing bicycle lanes on Illinois Street and César Chávez Street. Both of these projects were identified as part of the 20 priority projects in the 2005 Bicycle Plan. These projects are currently undergoing environmental review. MTA's analysis of César Chávez Street would determine if a travel lane or parking (or some combination) should be removed to create space for bicycles lanes on César Chávez Street between U.S. 101 and I-280. To the east of I-280, there are bicycle lanes currently striped around Mississippi Street. To the west, there is a bicycle bridge that connects westbound cyclists to bicycle lanes on Potrero Avenue. There are several other bicycle improvement projects in the vicinity of the Central Waterfront, including improvements to the connection between César Chávez Street and Bayshore Boulevard/Potrero Avenue, and planning for bicycle lanes on Bayshore Boulevard. Route #9 on Indiana Street has also been slated for yet-to-be-determined potential improvements.

Because the baseline bicycle volumes on these routes are relatively low, it is not expected that the added bicycle trips would cause significant bicycle impacts. However, depending on the design of the new development projects, there may be added conflicts with garage access along these bicycle routes.

Parking

2025 No-Project Scenario

The projected growth in residential housing units and employment within the four neighborhoods would result in an increased parking supply and demand. The extent to which new parking demand would be accommodated would depend on the existing parking supply that the new development would displace and the intensity of use (e.g., PDR uses generate fewer vehicle trips per 1,000 square feet than retail or office uses). Individual development projects would be required to comply with provisions of the Planning Code pertaining to vehicle parking and car-sharing spaces, and with Planning Code provisions and Planning Commission policy regarding separation of parking costs from housing costs in new residential buildings.

Under 2025 No-Project conditions, the number of residential units within the Eastern Neighborhoods are projected to increase (from 2000 baseline conditions) by 2,871 units, with the

greatest amount of development projected to occur within East SoMa (1,581 units). The parking demand associated with these residential units would range from about 2,650 to about 4,300 spaces. Under the existing Planning Code provisions, most new residential developments are required to provide a minimum of one parking space per unit, except in the C-3 (downtown commercial) and downtown residential districts. Assuming the existing Code requirement, new residential development would provide a minimum of 2,871 parking spaces, which would result in a residential parking shortfall of up to 1,436 parking spaces, depending on the actual demand. A portion of the overnight residential parking demand not accommodated within the new development could be met on-street. In general, there is available on-street parking capacity in East SoMa, Showplace Square, and the Central Waterfront neighborhoods. On-street parking within the Mission District is generally fully-occupied during the weekday daytime and overnight hours (with the exception of the industrial area within the northeast portion of the Mission District).

Under 2025 No-Project conditions, non-residential development within the Eastern Neighborhoods is projected to increase (from 2000 baseline conditions) by about 3.4 million square feet, with the greatest amount of growth projected to occur within Showplace Square/Potrero Hill (about 2.0 million square feet) and East SoMa (about 718,000 square feet). New development would likely provide off-street parking to meet the existing Planning Code minimum requirements for the various uses. However, it is anticipated that the new supply would not accommodate the entirety of the projected demand associated with the new development, and there would be a parking shortfall. Within the Eastern Neighborhoods, existing on-street parking is well-utilized during the daytime hours, and there is limited capacity to accommodate a substantial increase in demand. As a result of the parking shortfall, some drivers may circle around the neighborhood in search of parking, which would add traffic congestion to the local street network. The expectation is also that some drivers, frustrated by the shortage of available parking would shift to public transit or other modes (such as bicycling), while others would search out alternative parking within reasonable distance of their destination.

Proposed Project

Proposed Policy Framework

As part of the project, the following policies applicable to parking requirements are proposed, and would be anticipated, over time, to reduce parking demand, although it is not possible to accurately quantify this potential change.

Draft East SoMa Plan

- Objective 4.2: Establish Parking Policies That Improve The Quality Of Neighborhoods And Reduce Traffic Congestion By Encouraging Travel By Public Transit Or Other Non-Auto Transportation Modes.
- Policy 4.2.1: Eliminate minimum off-street parking requirements and establish parking caps for new residential and commercial developments.

- Policy 4.2.2: Make the cost of parking visible to users. Require parking to be rented, leased or sold separately from residential and commercial space for all new major development.
- Policy 4.2.3: Encourage innovative parking arrangements that make efficient use of space.
- Policy 4.2.4: Establish parking pricing that favors short-term use.
- Policy 4.2.5: Discourage construction of new public parking facilities.
- Objective 4.4: Ensure The Least Possible Negative Impact From Parking On The Physical Character And Quality Of The Neighborhood.
- Policy 4.4.1: Encourage parking and loading access from alleys, rather than primary streets.
- Policy 4.4.2: Prohibit curb cuts to access off-street parking and loading in the 6th Street Neighborhood Commercial Transit District and along all Transit Preferential Streets; discourage along 2nd Street.

Draft Mission Plan

- Objective 4.2: Reduce traffic congestion by establishing parking policies that encourage travel by public transit or other alternative transportation modes.
- Policy 4.2.1: Eliminate minimum off-street parking requirements and establish parking caps for new residential and commercial developments in mixed-use areas and areas adjacent to significant transit services.
- Policy 4.2.2: Make the cost of parking visible to users. Require parking to be rented, leased or sold separately from residential and commercial space for tenants or owners in all new major development.
- Policy 4.2.3: Encourage, or require where appropriate, innovative parking arrangements that make efficient use of space and that discourage the use of autos for everyday use.
- Policy 4.2.4: Discourage auto commuting by requiring rates to favor short-term users, installing parking meters on all streets outside established residential areas and considering residential parking permits if necessary in residential areas.
- Policy 4.2.5: Discourage construction of new public parking facilities.
- Policy 4.2.6: Prohibit parking as a principal use.
- Objective 4.3: Support the circulation needs of existing PDR uses in the Mission.
- Policy 4.3.1: Provide an adequate amount of short-term, on-street curbside freight loading spaces in PDR areas in the Mission.
- Policy 4.3.2: Require off-street facilities for freight loading and service vehicles in any new major non-residential developments.
- Policy 4.3.3: Where appropriate, enhance access for vehicles serving PDR activities, giving them priority over other users.
- Objective 4.5: Encourage alternatives to car use and ownership.
- Policy 4.5.1: Continue to require car-sharing arrangements in new residential and commercial developments, as well as any parking garages.
- Policy 4.5.2: Provide space for car sharing vehicles in convenient, visible locations.
- Policy 4.5.3: Require large retail uses to provide free or discounted shuttle and delivery services to customers.

- Policy 4.5.4: Require major institutions to create "transportation demand management" programs, to encourage students, staff and faculty to use alternative transportation modes.

Draft Showplace Square/Potrero Hill Plan

- Objective 3.2: Reduce Traffic Congestion By Establishing Parking Policies That Encourage Travel By Public Transit Or Other Alternative Transportation Modes.
- Policy 3.2.1: Eliminate minimum off-street parking requirements and establish parking caps for new residential and commercial developments in mixed-use areas and areas adjacent to significant transit services.
- Policy 3.2.2: Make the cost of parking visible to users. Require parking to be rented, leased or sold separately from residential and commercial space for tenants or owners in all new major development.
- Policy 3.2.3: Encourage, or require where appropriate, innovative parking arrangements that make efficient use of space and that discourage the use of autos for everyday use.
- Policy 3.2.4: Discourage auto commuting by requiring rates to favor short-term users, installing parking meters on all streets outside established residential areas and considering residential parking permits if necessary in residential areas.
- Policy 3.2.5: Discourage construction of new public parking facilities.
- Policy 3.2.6: Prohibit parking as a principal use.

Draft Central Waterfront Plan

- Objective 7: Manage Off-Street Parking To Encourage New Housing Development And Support Local Businesses While Recognizing The Limited Capacity Of The Street Network To Carry More Automobiles.
- Policy 7.1: Eliminate minimum parking requirements in the Planning Code and establish maximums for all uses within a half mile of the Third Street light rail stations and the Caltrain station, and for all below-market-rate, elderly, and institutional housing units.
- Policy 7.2: Require parking to be rented, leased, or sold separately from residential and commercial space for all developments seeking conditional use permits.
- Policy 7.3: Limit long-range parking associated with Pier 70 opportunity site development.
- Policy 7.4: Promote car-sharing as an important means to reduce parking needs while still providing residents with access to an automobile. Provide space for city-recognized car sharing vehicles in convenient, visible locations, particularly at the 22nd Street Caltrain station and near transit stops on Third Street.
- Policy 7.5: Encourage new development to provide innovative parking solutions and to make more efficient use of space devoted to parking.

Project Impacts

The analysis of parking impacts are specific to individual development projects, and includes a dual comparison of proposed parking space supply versus Planning Code requirements and the estimated parking demand. As such, separate parking impact analyses would need to be conducted for future development projects in the study area. For the purpose of this analysis, however, parking impacts associated with the proposed rezoning and area plans were assessed by

comparing the anticipated parking supply which would be required (based on the proposed rezoning) to the anticipated parking demand.

Individual development projects in the Eastern Neighborhoods would be required to comply with the Planning Code requirements for parking, including the number of parking spaces, provision of car-sharing spaces, and the separation of parking costs from housing costs in new residential buildings. However, all three rezoning options would include changes to the Planning Code requirements for both residential and non-residential uses. For non-residential uses, the current minimum requirement would be the maximum permitted, except for office uses, for which a maximum of 7 percent of building gross floor area could be devoted to parking. For residential uses, up to one space per unit would be maximum permitted (rather than minimum required), except for development within the mixed-use and transit-oriented residential (e.g., RTO and NC-T) zoning districts, where a maximum of 0.5 to 0.75 spaces per unit would be permitted, with a somewhat greater amount conditionally permitted. As indicated below in the analysis by neighborhood, the proposed project would result in a substantial shortfall in residential parking supply relative to residential parking demand, based on the demand factors in the Planning Department transportation analysis guidelines. It is not anticipated that the shortfall would be accommodated on-street in any of the four neighborhoods, under any of the three rezoning options. (The degree of the shortfall would vary by option.) While the parking shortfall may result in some drivers circling the neighborhood in search of parking, adding to local traffic congestion, the expectation is that many residents would chose not to own automobiles, particularly if adequate transit access were available or were provided going forward. For non-residential development, it is anticipated that the parking demand would be substantially accommodated within the permitted parking supply.

For each neighborhood and rezoning option, parking demand and supply is presented as a range, as it is not possible to know with certainty the size of residential units or the precise mix of non-residential land uses that would be developed.

East SoMa

Under Option A, parking demand would range from a net reduction of slightly more than 300 spaces (because of the relatively large decline anticipated in non-residential uses) to a net increase of almost 250 spaces. Parking demand under Option B would be between about 785 and 2,175 spaces, while under Option C, demand would be between about 1,700 and 2,840 spaces. Under all three rezoning options, the residential parking demand would represent the majority of the parking demand.

Under each rezoning option, residential development in East SoMa would be in either the Mixed-Use Residential or the Neighborhood Commercial Transit districts, except for Option A. Under all options, if the maximum permitted number of 0.5 spaces per unit is provided, there would be a substantial shortfall in parking spaces provided relative to the projected demand. If conditional

use permits are pursued, the number of parking spaces provided would be closer to the projected demand, however, there would still be shortfall in supply relative to demand.

Mission

Under Option A, parking demand would range from a net reduction of about 175 spaces (because of the decline anticipated in non-residential uses) to a net increase of about 50 spaces. Parking demand under Option B would be between about 700 and 1,150 spaces, while under Option C, demand would be between about 6,150 and 7,200 spaces. Under Options A and B, the residential parking demand would represent the majority of the parking demand, but under Option C, the non-residential parking demand of nearly 4,750 spaces would be substantially greater than the residential demand.

Within the Mission, Option C would have the greatest amount of residential development that would be primarily within the Mixed-Use Residential, Residential Transit Oriented, or the Neighborhood Commercial Transit zoning districts. Under Option A, about 34 percent of new residential development (beyond 2025 No-Project conditions) would be in these two zoning districts, and under Option B about 54 percent of new residential development would be in these districts. Under Option C, if the maximum permitted of 0.5 spaces per unit is provided, there would be a substantial shortfall in parking spaces provided relative to the projected demand. If conditional use permits are pursued, the number of parking spaces provided would be closer to the projected demand, however, there would still be shortfall in supply relative to demand. Under Option A and Option B, the projected parking demand would not be accommodated within the allowable permitted parking, also resulting in a parking shortfall. Non-residential parking demand associated with Option A and Option B would be generally accommodated within the permitted supply. Under Option C, however, the non-residential parking demand of more than 4,700 spaces would likely not be accommodated by the permitted supply, resulting in a substantial non-residential parking shortfall. As a result of the parking shortfalls under all three options, some drivers may circle around the neighborhood in search of parking, or shift to public transit or other modes (such as bicycling).

Showplace Square/Potrero Hill

Under Option A, parking demand would range from about 2,750 to 3,400 spaces. Parking demand under Option B would be between about 2,100 and 2,900 spaces, while under Option C, demand would be between about 2,600 and 3,900 spaces. Under all three options, the residential parking demand would represent the large majority of the parking demand.

Within this subarea, residential development associated with Option A would be within the Mixed-Use Residential, Residential Transit Oriented, or the Neighborhood Commercial Transit zoning districts. Under Option A, if the maximum permitted of 0.5 spaces per unit is provided, there would be a substantial shortfall in parking spaces provided relative to the projected demand. If conditional use permits are pursued, the number of parking spaces provided would be closer to

the projected demand; however, there would still be shortfall in supply relative to demand. Under Option B and Option C, up to one parking space per unit would be permitted, and projected parking demand would substantially be accommodated within the permitted supply. Non-residential parking demand associated with all three options within the Showplace Square area would be minimal (compared to 2025 No-Project conditions), would decline under both Options B and C, and would generally be accommodated within the permitted supply. As a result of the parking shortfalls projected under all three options, some drivers may circle around the neighborhood in search of parking, or shift to public transit or other modes (such as bicycling).

Central Waterfront

Under Option A, parking demand would range from about 3,750 to 5,100 spaces. Parking demand under Option B would be between about 800 and 1,200 spaces, while under Option C, demand would be between about 550 and 675 spaces. Under all three options, the residential parking demand would represent the large majority of the parking demand.

Within the Central Waterfront subarea, residential development associated with all three options would primarily be within the Mixed-Use Residential or the Neighborhood Commercial Transit zoning districts. Under each of the options, if the maximum permitted of 0.5 spaces per unit is provided, there would be a substantial shortfall in parking spaces provided relative to the projected demand. If conditional use permits are pursued, the number of parking spaces provided would be closer to the projected demand, however, there would still be shortfall in supply relative to demand. Non-residential parking demand associated with all three options within the Central Waterfront subarea would be minimal (compared to 2025 No-Project conditions), and would generally be accommodated within the permitted supply. As a result of the parking shortfalls projected under all three options, some drivers may circle around the neighborhood in search of parking, or shift to public transit or other modes (such as bicycling).

Because parking deficits are considered to be social effects, rather than impacts on the physical environment as defined by CEQA, the anticipated parking shortfall would be a less-than-significant effect of the proposed Eastern Neighborhoods project.

Loading

In general, the analysis of loading impacts are specific to individual development projects, and includes a comparison of proposed loading space supply to the Planning Code requirements and the estimated loading demand during the peak hour of loading activities. As such, loading impacts have not been assessed for the proposed Eastern Neighborhoods Rezoning and Area Plans project or for the 2025 No-Project scenario. To the extent that loading demand is not accommodated on-site, double-parking, illegal use of sidewalks and other public space is likely to occur with associated disruptions and impacts to traffic and transit operations as well as to bicyclists and pedestrians.

Construction Impacts

In general, the analysis of construction impacts are specific to individual development projects, and include a discussion of temporary roadway and sidewalk closures, relocation of bus stops, effects on roadway circulation due to construction trucks, and the increase in vehicle trips, transit trips and parking demand associated with construction workers. As such, construction impacts have not been assessed for the proposed project. It should be noted that potential impacts associated with individual projects are not generally considered significant because they are temporary and of short-term duration.

Construction-related activities typically occur Monday through Friday, between 6:00 a.m. and 6:00 p.m., with limited construction activities on weekends (on an as-needed basis). Construction staging typically occurs within project sites and from the adjacent sidewalks. These sidewalks along the site frontages are usually closed throughout the construction duration, with temporary pedestrian walkways constructed in the adjacent parking lanes as needed. Temporary traffic lane closures are required to be coordinated with the City in order to minimize the impacts on local traffic.

During a project's construction period, temporary and intermittent traffic and transit impacts may result from truck movements to and from project sites. Truck movements during periods of peak traffic flow would have greater potential to create conflicts than truck movements during non-peak hours because of the greater number of vehicles on the streets during the peak hour that would have to maneuver around queued trucks. The sponsors of individual projects would have to meet with Muni, the Department of Parking and Traffic, Interdepartmental Staff Committee on Traffic and Transportation (ISCOTT), and other responsible City agencies to coordinate construction activities so as to minimize construction impacts on vehicular, transit and pedestrian traffic.

Temporary parking demand from construction workers' vehicles and impacts on local intersections from construction worker traffic would occur in proportion to the number of construction workers who would use automobiles. Parking of construction workers' vehicles would temporarily increase occupancy levels in off-street parking lots, either by those vehicles or by vehicles currently parking in on-street spaces that would be displaced by construction workers' vehicles.

In summary, the project would result in a significant adverse impact on traffic and circulation, a potentially significant impact on transit, and less-than-significant impacts pm parking and loading and pedestrian and bicycle conditions.

F. Noise

Environmental Setting

Sound Descriptors

Decibel

Sound is characterized by various parameters that describe the rate of oscillation (frequency) of sound waves, the distance between successive troughs or crests in the wave, the speed that it travels, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound, and the decibel (dB) scale is used to quantify sound intensity. Because sound can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. A 10-dBA increase in the level of a continuous noise represents a perceived doubling of loudness. The noise levels presented herein are expressed in terms of dBA, unless otherwise indicated. **Table 43** shows some representative noise sources and their corresponding noise levels in dBA.[123]

Planning for acceptable noise exposure must take into account the types of activities and corresponding noise sensitivity in a specified location for a generalized land use type. Some general guidelines[124] are as follows: sleep disturbance can occur at levels above 35 dBA; interference with human speech begins at about 60 dBA; and hearing damage can result from prolonged exposure to noise levels in excess of 85 to 90 dBA.

Leq, CNEL, Ldn

Time variations in noise exposure are typically expressed in terms of a steady-state energy level (called Leq) that represents the acoustical energy of a given measurement. Leq (24) is the steady-state energy level measured over a 24-hour period. Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dBA increment be added to "quiet time" noise levels to form a

[123] U.S. Department of Housing and Urban Development, *The Noise Guidebook*, 1985. Available on the internet at: http://www.hud.gov/offices/cpd/energyenviron/environment/resources/guidebooks/noise/.

[124] U.S. Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. March, 1974. Available on the internet at: http://nonoise.org/library/levels74/levels74.htm.

TABLE 43
TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT

Examples of Common, Easily Recognized Sounds	Decibels (dBA) At 50 feet	Subjective Evaluations
Near Jet Engine	140	Deafening
Threshold of Pain (Discomfort)	130	
Threshold of Feeling – Hard Rock Band	120	
Accelerating Motorcycle (at a few feet away)	110	
Loud Horn (at 10 feet away)	100	Very Loud
Noisy Urban Street	90	
Noisy Factory	85[1]	
School Cafeteria with Untreated Surfaces	80	Loud
Near Freeway Auto Traffic	60[2]	Moderate
Average Office	50[2]	
Soft Radio Music in Apartment	40	Faint
Average Residence Without Stereo Playing	30	
Average Whisper	20	Very Faint
Rustle of Leaves in Wind	10	
Human Breathing	5	
Threshold of Audibility	0	

[1] Continuous exposure above 85 dBA is likely to degrade the hearing of most people.
[2] Range of speech is 50 to 70 dBA.
Source: U.S. Department of Housing and Urban Development, *The Noise Guidebook.* 1985.

24-hour noise descriptor called the Community Noise Equivalent Level (CNEL). CNEL adds a 5-dBA "penalty" during the evening hours (7:00 p.m. to 10:00 p.m.) and a 10-dBA penalty during the night hours (10:00 p.m. to 7:00 a.m.). Another 24-hour noise descriptor, called the day-night noise level (Ldn), is similar to CNEL, except that Ldn adds only the 10-dBA nighttime penalty, not the evening penalty. In practice, Ldn and CNEL usually differ by less than 1 dBA at any given location for transportation noise sources, which is generally an imperceptible difference.

Health Effects of Environmental Noise

The World Health Organization (WHO) is perhaps the best source of current knowledge regarding health impacts due to the fact that the European nations have continued to study noise and its health effects, while the U.S. Environmental Protection Agency all but eliminated its noise investigation and control program in the 1970s.[125] According to WHO, sleep disturbance can occur when continuous indoor noise levels exceed 30 dBA or when intermittent interior noise levels reach 45 dBA, particularly if background noise is low. With a bedroom window slightly

[125] The *San Francisco General Plan* Land Use Compatibility Guidelines for Community Noise, presented below in Figure 19, were created during the same era.

open (a reduction from outside to inside of 15 dB), the WHO criteria would suggest exterior continuous (ambient) nighttime noise levels should be 45 dBA or below, and short-term events should not generate noise in excess of 60 dBA. WHO also notes that maintaining noise levels within the recommended levels during the first part of the night is believed to be effective for the ability to fall asleep.[126]

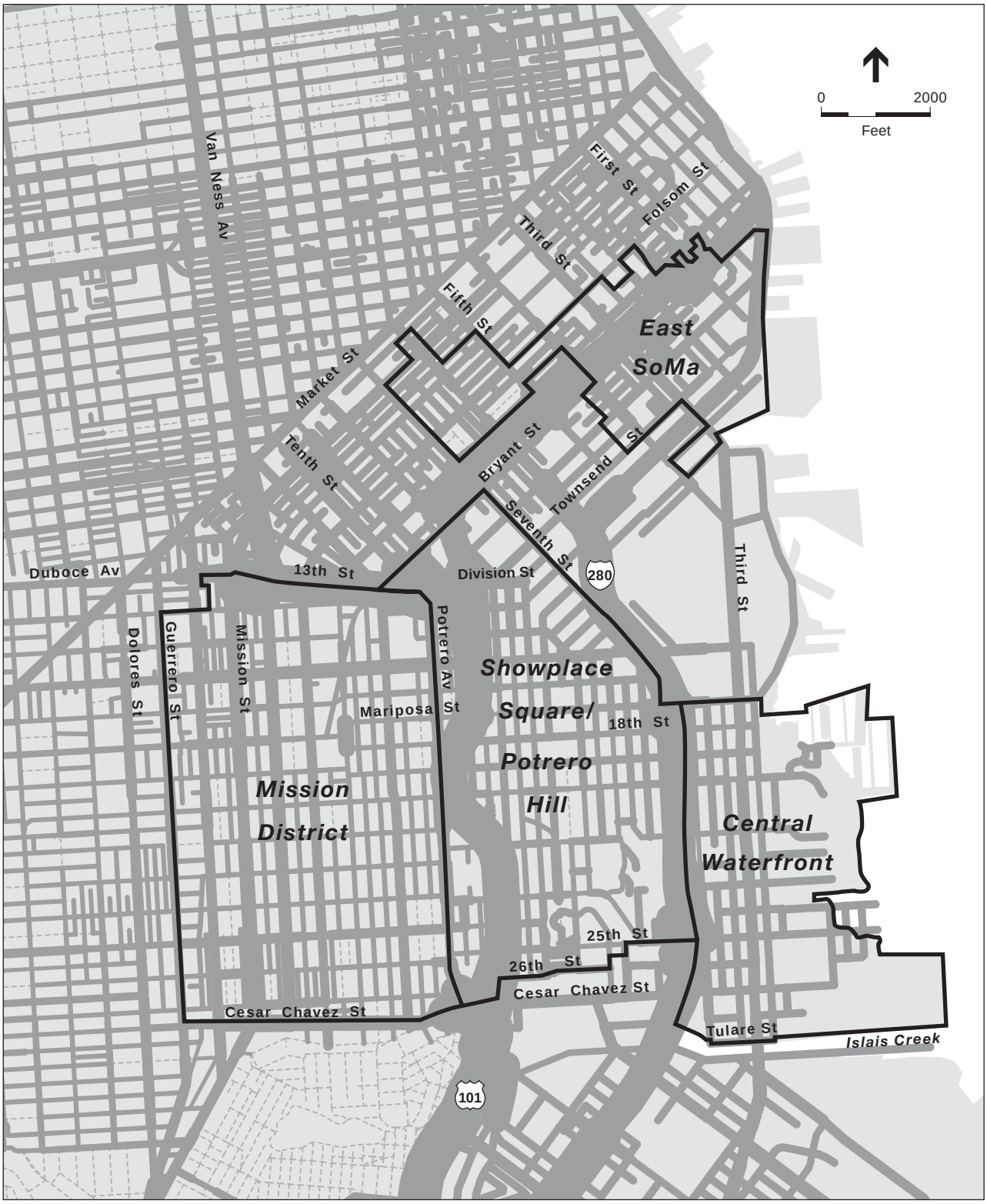
Other potential health effects of noise identified by WHO include decreased performance on complex cognitive tasks, such as reading, attention, problem solving, and memorization; physiological effects such as hypertension and heart disease (after many years of constant exposure, often by workers, to high noise levels); and hearing impairment (again, generally after long-term occupational exposure, although shorter-term exposure to very high noise levels, for example, exposure several times a year to concert noise at 100 dBA). Noise can also disrupt speech intelligibility at relatively low levels; for example, in a classroom setting, a noise level as low as 35 dBA can disrupt clear understanding. Finally, noise can cause annoyance, and can trigger emotional reactions like anger, depression, and anxiety. WHO reports that, during daytime hours, few people are seriously annoyed by activities with noise levels below 55 dBA, or moderately annoyed with noise levels below 50 dBA.[127]

Existing Noise Environment

Long-term environmental noise is primarily dependent by vehicle traffic volumes as well as the mix of vehicle types. The existing ambient noise environment within the project area, typical of most urban areas, is dominated by vehicular traffic on the U.S. 101, I-80, and I-280 freeways as well as traffic on local roadways (autos, trucks, buses, and light rail trains). BART trains operate underground through the western margin of the project area (in the Mission), although their noise is typically apparent at street level only near ventilation grates in the street. Caltrain operations (surface trains) traverse the eastern portion of the project area, including both the Showplace Square/Potrero Hill and Central Waterfront neighborhoods, straddling the boundary between these neighborhoods, before terminating at Fourth and Townsend Streets, in East SoMa.

The San Francisco Department of Public Health (DPH) has mapped transportation noise throughout the City of San Francisco, based on modeled baseline traffic volumes derived from the San Francisco County Transportation Authority travel demand model. DPH draft maps indicate the areas subject to noise levels over 60 dBA (Ldn) and the range of Ldn noise levels that occur on every street within the City. The portions of these maps that cover the project area are presented as **Figures 17** and **18**. As indicated in these figures, noise levels along most

[126] World Health Organization, *Guidelines for Community Noise.* Geneva, 1999. Available on the internet at: http://www.who.int/docstore/peh/noise/guidelines2.html. This document is also available for review by appointment at the Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2004.0160E.
[127] Ibid.



Areas of traffic noise of 60 dB or greater

Streets with noise volumes less than 60 dB

NOTE: Map is a draft that is subject to refinement by DPH.

SOURCE: San Francisco Department of Public Health (DPH)

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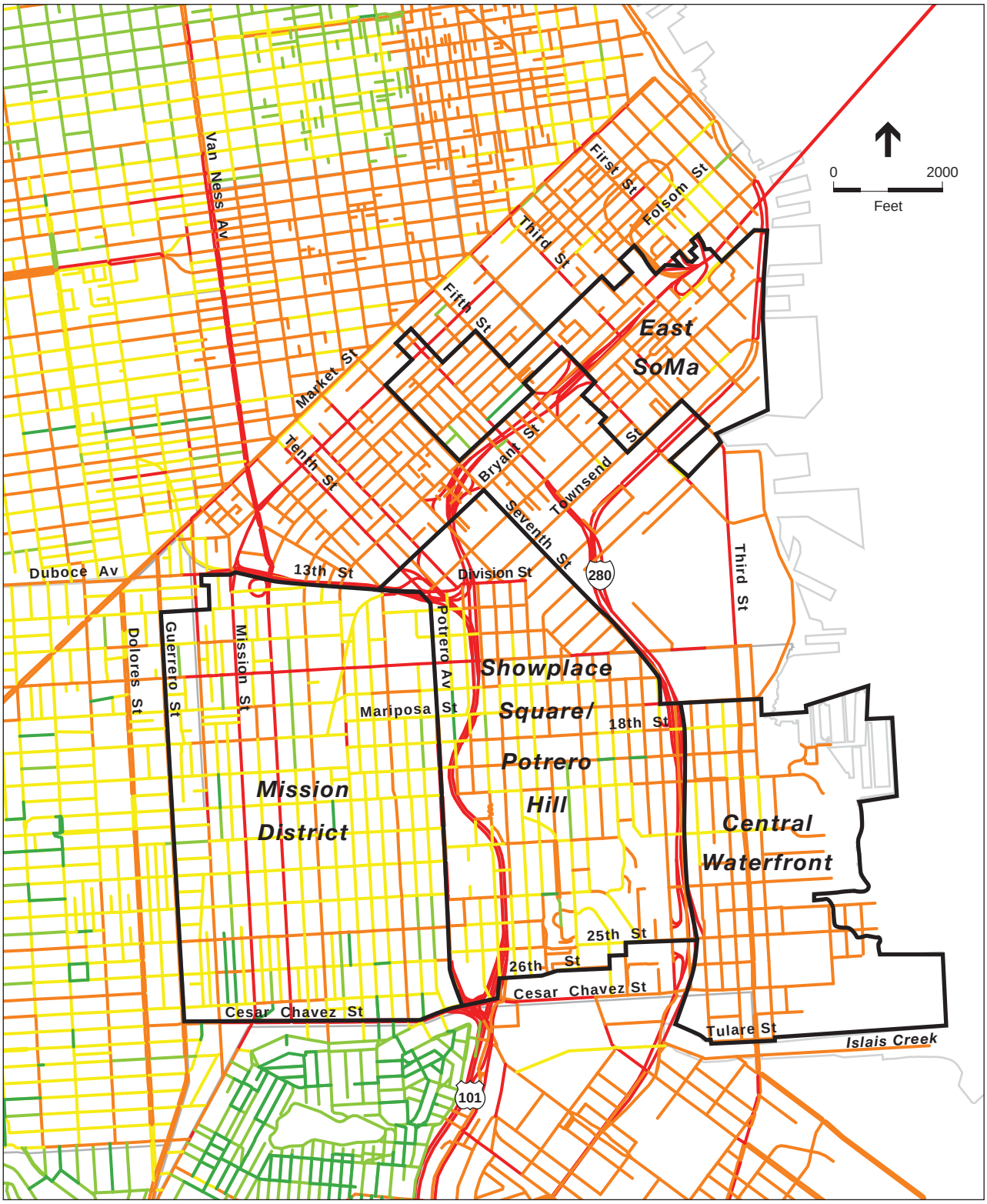
Figure 17
Traffic Noise Levels



Street Noise Levels: Ldn (dBA) ≤ 55.0 | 55.1 - 60.0 | 60.1 - 65.0 | 65.1 - 70.0 | > 70.0

NOTE: Map is a draft that is subject to refinement by DPH.

SOURCE: San Francisco Department of Public Health (DPH)

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Figure 18
Street Noise Levels

streets in the project area would exceed 60 dBA (Ldn).[128] Figure 18 indicates the following existing noise conditions in each neighborhood.

In addition to vehicle traffic, continuous sources of machinery and mechanical noise also contribute to ambient noise levels. On the other hand, short-term noise sources, such as truck back-up beepers, the crashing of material being loaded or unloaded, and car doors slamming and engines revving outside a nightclub, contribute very little to 24-hour noise levels but are capable sleep disturbance and severe annoyance. The importance of noise to receptors is dependent on both time and context. For example, long-term high noise levels from large traffic volumes can make conversation at a normal voice level difficult or impossible, while short-term peak noise levels, if they occur at night, can disturb sleep.

The Eastern Neighborhoods also have abundant existing commercial and industrial uses which oftentimes requires delivery and processing during late night and early morning hours, a time when the residential population is most sensitive to the effects of noise. These activities contribute to long-term noise, but perhaps more importantly to short-term peak noise levels. Food and other perishables requiring delivery in refrigerated trucks, backup beepers, and forklifts all generate noise in excess of ambient nighttime levels. In recent years, new residential uses in and around the Eastern Neighborhoods (including many in Western SoMa), have resulted in reported noise conflicts between new residential development and existing commercial uses, including wholesale distribution firms and contractors, as well as conflicts with some of the nightclubs in Western SoMa.

East SoMa

This neighborhood is traversed by the elevated I-80 freeway and noise levels along the freeway exceed 70 dBA (Ldn). According to the DPH maps, the sections of The Embarcadero, Third Street, and Fourth Street that occur within East SoMa also have noise levels above 70 dBA (Ldn). Noise levels along almost all other streets within this area range between 65 and 70 dBA (Ldn). Other than some mid-block alleys, there are virtually no street segments with noise levels below 60 dBA (Ldn).

Mission

There are no freeways that extend through the Mission. The elevated U.S. 101 freeway is east of the Mission, so that only a small portion of the easternmost margin of this neighborhood could be affected by noise from this freeway. Figure 18 indicates that the U.S. 101 freeway as well as the segments of Mission Street, South Van Ness Avenue, 13th Street, 16th Street, and César Chávez Street that traverse this neighborhood have noise levels above 70 dBA (Ldn). Folsom, Bryant,

[128] Note that the noise levels presented in the figure are 24-hour noise levels, in which nighttime noise is given additional weight. These noise levels are not directly comparable to the noise levels discussed under "Health Effects of Environmental Noise," as those noise levels are for specified periods of less than 24 hours.

and 24th streets have noise levels between 65 and 70 dBA (Ldn), while most other streets within this neighborhood, including most east-west routes, have noise levels ranging between 60 and 65 dBA (Ldn). There are a few street segments with noise levels below 60 dBA (Ldn).

Showplace Square/Potrero Hill

The western portion of this neighborhood is traversed by the U.S. 101 freeway, while the I-280 freeway is located along the eastern margin of this neighborhood. Noise levels along these freeways as well as along Potrero Avenue (which extends along the western margin of this neighborhood and divides it from the Mission District) and a short segment of 16th Street have noise levels above 70 dBA (Ldn). Noise levels along streets north of 16th Street have noise levels between 65 and 70 dBA (Ldn). South of 16th Street, noise levels along most streets in this neighborhood range between 60 and 70 dBA (Ldn), while a few street segments have noise levels below 60 dBA (Ldn).

Central Waterfront

The western portion of this neighborhood is traversed by the I-280 freeway and noise levels along the freeway exceed 70 dBA (Ldn). According to the DPH map (Figure 18), all other streets in this neighborhood have noise levels between 60 and 70 dBA (Ldn), with most streets in this area having noise levels between 65 and 70 dBA (Ldn).

Sensitive Receptors

Sensitive noise receptors are generally considered to include hospitals, nursing homes, senior citizen centers, schools, churches, libraries, and residences. Land uses within the Eastern Neighborhoods are described in detail in Section IV.A, Land Use. Residential uses occur in parts of each of the Eastern Neighborhoods. Many schools and churches are located within the Mission and Showplace Square/Potrero Hill neighborhoods; there are fewer such institutions in East SoMa and fewer still in the Central Waterfront at present. San Francisco General Hospital is located in near the southeastern margin of the Showplace Square/Potrero Hill neighborhood, while there are several convalescent facilities and nursing homes in the Mission and Showplace Square/Potrero Hill.

Regulatory Setting

California Noise Insulation Standards

State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are collectively known as the California Noise Insulation Standards and are found in Title 24 of the California Code of Regulations. For limiting noise transmitted between adjacent dwelling units, the noise insulation

standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior sources, the noise insulation standards set forth an interior standard of 45 dBA (Ldn) in any habitable room and, where such units are proposed in areas subject to noise levels greater than 60 dBA (Ldn), demonstration of how dwelling units have been designed to meet this interior standard. If the interior noise level depends upon windows being closed, the design for the structure must also specify a ventilation or air-conditioning system to provide a habitable interior environment.

San Francisco General Plan

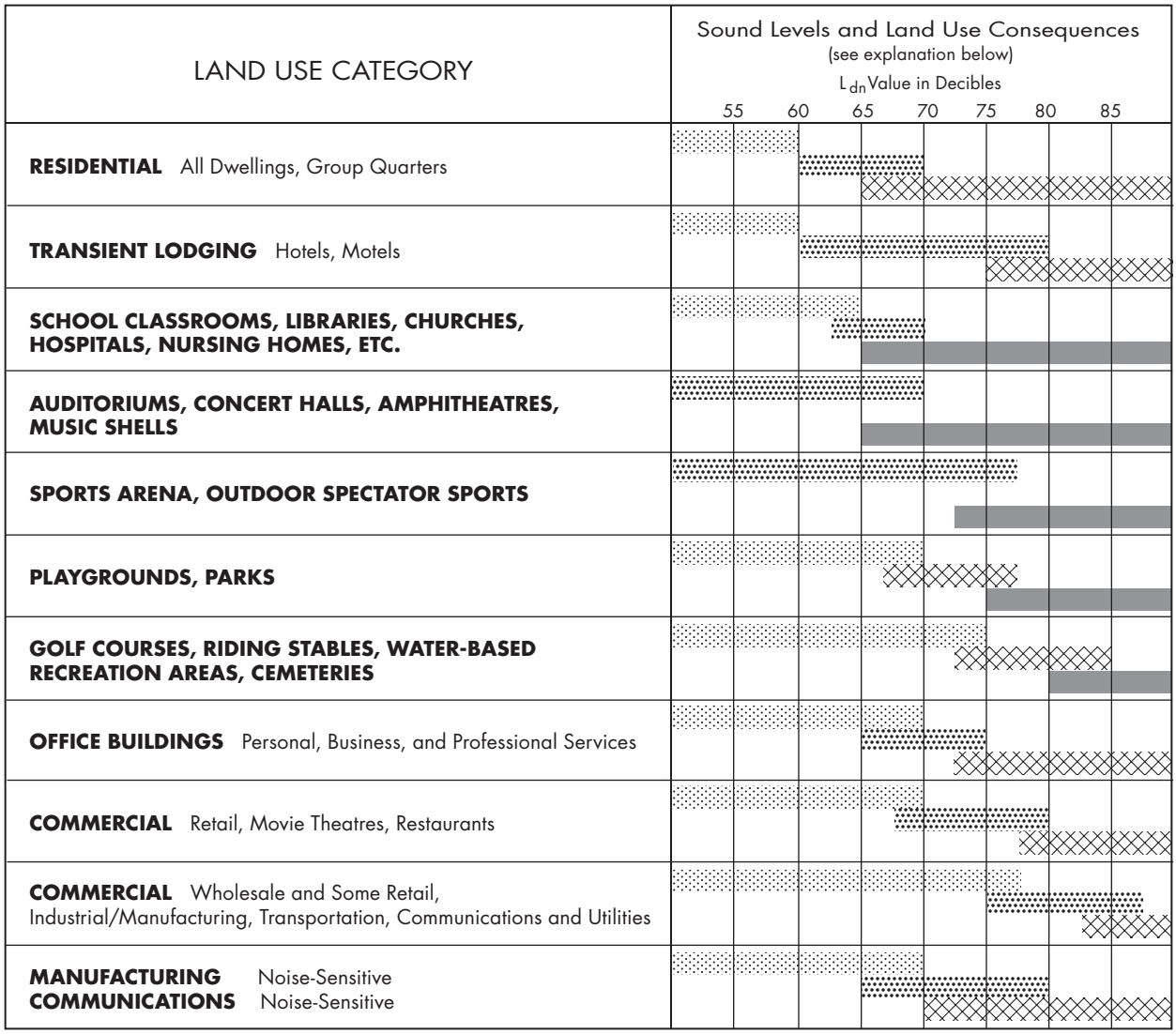
The Environmental Protection Element of the *San Francisco General Plan* contains Land Use Compatibility Guidelines for Community Noise.[129] These guidelines, which are similar to but differ somewhat from state guidelines promulgated by the Governor's Office of Planning and Research, indicate maximum acceptable noise levels for various newly developed land uses. These guidelines are presented in **Figure 19**. Although this figure presents a range of noise levels that are considered compatible or incompatible with various land uses, the maximum "satisfactory" noise level is 60 dBA (Ldn) for residential and hotel uses, 65 dBA (Ldn) for school classrooms, libraries, churches and hospitals, 70 dBA (Ldn) for playgrounds, parks, office buildings, retail commercial uses and noise-sensitive manufacturing/ communications uses, and 77 dBA for other commercial uses such as wholesale, some retail, industrial/manufacturing, transportation, communications, and utilities. If these uses are proposed to be located in areas with noise levels that exceed these guidelines, a detailed analysis of noise reduction requirements will normally be necessary prior to final review and approval.

San Francisco Noise Ordinance

In the City, regulation of noise is stipulated in Article 29 of the Police Code (the Noise Ordinance), which states the City's policy is to prohibit unnecessary, excessive, and offensive noises from all sources subject to police power. Sections 2907 and 2908 of Article 29 regulate construction equipment and construction work at night, while Section 2909 provides for limits on stationary-source noise from machinery and equipment. Sections 2907 and 2908 are enforced by the Department of Building Inspection, and Section 2909 is enforced by the Department of Public Health. Summaries of these and other relevant sections are presented below:

Section 2907(b) of the Police Code states it shall be unlawful for any person, including the City and County of San Francisco, to operate any powered construction equipment, regardless of age or date of acquisition, if the operation of such equipment emits noise at a level in excess of 80 dBA when measured at a distance of 100 feet from such equipment, or an equivalent sound level at some other convenient distance. Exemptions to this requirement include:

[129] City and County of San Francisco, Planning Department, San Francisco General Plan, Environmental Protection Element, Policy 11.1.



Satisfactory, with no special noise insulation requirements.

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

New construction or development should generally not be undertaken.

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SOURCE: San Francisco General Plan, Environmental Protection Element

Figure 19
Land Use Compatibility Chart for Community Noise

- Impact tools and equipment with intake and exhaust mufflers recommended by the manufacturers and approved by the Director of Public Works as best accomplishing maximum noise attenuation; and

- Pavement breakers and jackhammers equipped with acoustically attenuating shields or shrouds recommended by the manufacturers and approved by the Director of Public Works as best accomplishing maximum noise attenuation.

Section 2908 prohibits any person, between the hours of 8:00 pm of any day and 7:00 am of the following day to erect, construct, demolish, excavate for, alter, or repair any building or structure if the noise level created is in excess of the ambient noise level by 5 dBA at the nearest property line unless a special permit therefore has been applied for and granted by the Director of Public Works.

Section 2909, establishes a not-to-exceed noise standard for fixed sources of noise, such as building mechanical equipment and industrial or commercial processing machinery. Unlike the state building code (Title 24) standard, which is applicable to interior living space only, the standards in Section 2909 are applicable outdoors, at the property line of the affected use, and vary based on the zoning district in which the affected property is located. As is common for noise standards, the permitted noise level is lower at night (10:00 p.m. to 7:00 a.m.) than during the day. Section 2909 establishes maximum noise levels of 55 dBA (daytime) and 50 dBA (nighttime) in low-density residential districts, while the corresponding levels in medium- and high-density residential districts are 60 dBA (daytime) and 55 dBA (nighttime). In commercial districts, the noise limits are 65 dBA (daytime) and 60 dBA (nighttime), while in industrial districts, maximum noise levels are 70 dBA (M-1 districts) and 75 dBA (M-2 districts) at all hours.[130,131,132]

In addition to construction activities and operational noise from stationary equipment, Section 2901.11 addresses unnecessary, excessive or offensive noise in general. It states that "unnecessary, excessive or offensive noise shall mean any sound or noise conflicting with the criteria, standards, or levels set forth for permissible noises. In the absence of specific maximum noise levels, a noise level which exceeds the ambient noise level by 5 dBA or more when measured at the nearest property line … shall be deemed a prima facie violation of this Article."

[130] The Noise Ordinance has not been amended since 1973 and Section 2909 does not currently correspond to many existing zoning districts. For example, the ordinance makes no reference to existing mixed-use districts in the South of Market or to neighborhood commercial districts, which exist citywide, and the residential districts identified in the ordinance do not match the current array of residential districts in the Planning Code. Thus, enforcement of the ordinance involves a degree of interpretation as to its applicability in various use districts.

[131] Section 2909 does not apply to legally required emergency signaling devices, such as vehicle backup beepers or garage exit warning devices, nor does it apply to emergency standby equipment, provided such emergency equipment does not generate noise levels in excess of 75 dBA at the property line where it operates.

[132] Interior noise levels with windows slightly open are typically about 15 dB lower than exterior levels. Thus, the nighttime noise standards of 50 to 55 dBA in residential districts correlate to interior noise levels of 35 to 40 dBA. Lower interior noise levels can be attained with windows fully closed.

In addition, Section 2915 states that it is unlawful to make "unnecessary, excessive, or offensive noise," including music, that "disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance of any reasonable person of normal sensitivity residing or working in the area." The ordinance defines the ambient noise level to be the average noise level over a 15-minute period. For practical purposes the 15-minute equivalent level or Leq may be use to determine this average.

Impact Analysis

Significance Criteria

Implementation of the proposed project would have a significant noise impact if it were to:

- Expose people to or generate noise levels in excess of standards established in the San Francisco General Plan or noise ordinance (Article 29 of the Police Code);
- Expose people to or generate excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- For a project located within an area covered by an airport land use plan (or, where such a plan has not been adopted, within two miles of a public airport or public use airport), expose people residing or working in the project area to excessive noise levels;
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels; or
- Be substantially affected by existing noise levels.

Temporary, construction-related noise impacts associated with the proposed rezoning are discussed in the Initial Study (see Appendix A). The Initial Study determined that compliance with the San Francisco Noise Ordinance, which is required by law, and implementation of mitigation measures identified in the Initial Study would reduce construction noise effects from any subsequent development projects to a less-than-significant level. Therefore, construction-related noise impacts are not discussed further in this section.

The two airport-related criteria are not relevant to the proposed rezoning since the project area is located more than two miles from the San Francisco International Airport and not located near a private airstrip. Therefore, no further consideration of these criteria is provided.

Methodology

This analysis identifies potential noise impacts associated with future development that could result from the proposed rezoning. Noise issues evaluated in this section include: (1) noise generated by traffic generated by future growth under proposed rezoning options A, B, and C;

and (2) compatibility of potential future uses with San Francisco Land Use Compatibility Guidelines for Community Noise. Traffic noise modeling was completed using the Federal Highway Administration RD-77-108 model. Road segments that were analyzed were selected based on three criteria: (1) the estimated change in intersection volumes (total intersection volume must have a 10 percent increase or more under one or more options); (2) the proposed rezoning would allow residential uses to occur on this road segment; and (3) the range of intersections selected needed to be representative of the different neighborhoods. The one exception was the Mission, where study intersections in this neighborhood did not meet these criteria: intersection volume changes were generally less than 10 percent, with the only intersections with greater than a 10 percent increase being along 13th and Division Streets (beneath the elevated Central Freeway), which are not in proximity to existing or proposed residential uses. Therefore, it is expected that incremental noise increases on road segments in the Mission would be lower than those presented in Table 44, and future residential uses allowed by the proposed rezoning generally would not be affected by these increases.

Project-Related Traffic Noise Impacts

Based on baseline and future traffic projections developed as part of the transportation analysis for the proposed project, baseline and future noise levels were estimated for representative major streets within the project area: Second Street, Third Street, 7th Street, 16th Street, Brannan Street, Harrison Street, Mariposa Street, and Pennsylvania Street. Noise level estimates for various segments of these roads are presented in Table 44. As shown in this table, the greatest noise increases (up to 3 dBA) would occur from future (2025) growth that would occur without the proposed rezoning (i.e., 2025 No-Project conditions). The proposed rezoning under all options would increase these future No-Project noise levels by 1 dBA or less. In general, traffic noise increases of less than 3 dBA are not perceptible to most people, while a 5-dBA increase is readily noticeable.[133] Therefore, permanent increases in ambient noise levels of less than 3 dBA are considered to be less than significant, and implementation of the proposed Eastern Neighborhoods Rezoning and Area Plans would have a less-than-significant noise impact due to noise created by project-generated traffic.

Cumulative Traffic Noise Impacts

When traffic noise increases associated with the proposed rezoning are considered future No-Project noise levels would increase by an additional 1 to 3 dBA, depending on location and option. As indicated in Table 44, in the columns headed, “dBA Change from Baseline (Cumul.),” when noise increases from future background traffic growth are considered with project-related noise increases, the cumulative increase from baseline noise levels would increase

[133] California Department of Transportation, Environmental Program, Noise, Air Quality, and Hazardous Waste Management Office, “Technical Noise Supplement,” October 1998; pp. 41 – 42. Available on the internet at: http://www.dot.ca.gov/hq/env/noise/pub/Technical%20Noise%20Supplement.pdf.

TABLE 44
FUTURE NOISE LEVEL CHANGES ALONG SELECTED ROADWAY SEGMENTS

	Noise Level (Ldn @ 50 feet from Roadway Centerline)											
Street Segment	**Baseline (2000)**	**Future No-Project (2025)**	**dBA Change from Baseline**	**Future + Option A (2025)**	**dBA Change from Future No-Project**	**dBA Change from Baseline (Cumul.)**	**Future + Option B (2025)**	**dBA Change from Future No-Project**	**dBA Change from Baseline (Cumul.)**	**Future + Option C (2025)**	**dBA Change from Future No-Project**	**dBA Change from Baseline (Cumul.)**
East SoMa												
Second Street (n/Brannan)	65.5	65.1	-0.4	65.4	0.3	-0.1	65.7	0.5	0.2	65.6	0.5	0.1
Second Street (s/Brannan)	63.5	63.2	-0.3	63.5	0.3	0	63.8	0.6	0.3	63.7	0.5	0.2
Brannan Street (w/Second)	65.0	65.5	0.5	64.7	-0.8	-0.3	65.2	-0.4	0.2	64.7	-0.9	-0.3
Brannan Street (e/Second)	63.6	64.2	0.6	63.4	-0.8	-0.2	64.1	-0.1	0.5	63.3	-0.9	-0.3
Seventh Street (n/Harrison)	68.8	69.8	1.0	70.3	0.5	1.5	70.5	0.7	1.7	69.1	-0.7	0.3
Harrison Street (e/Seventh)	68.7	69.0	0.3	69.7	0.7	1	70.2	1.2	1.5	68.8	-0.2	0.1
Showplace Sq./Potrero Hill									0			0
Brannan Street (w/Seventh)	67.3	67.3	0.1	66.9	-0.5	-0.4	67.2	-0.1	-0.1	67.8	0.4	0.5
Brannan Street (e/Eighth)	66.3	68.4	2.1	66.9	-1.6	0.6	67.2	-1.2	0.9	67.8	-0.7	1.5
Mariposa Street w/I-280)	66.3	64.3	-2.1	65.6	1.3	-0.7	66.4	2.1	0.1	67.0	2.7	0.7
Central Waterfront									0			0
Third Street (n/5th)	67.8	69.4	1.6	69.4	0.0	1.6	69.5	0.0	1.7	69.5	0.1	1.7
16th Street (e/Rhode Island)	64.2	67.1	2.9	67.5	0.4	3.3	67.6	0.6	3.4	67.5	0.5	3.3
Mariposa Street (e/I-280)	63.2	66.0	2.7	65.8	-0.1	2.6	66.6	0.6	3.4	66.8	0.8	3.6
Pennsylvania Street (n/I-280 ramps)	66.7	67.1	0.4	67.8	0.7	1.1	68.1	1.0	1.4	67.9	0.8	1.2

NOTES: Assumptions include: Travel speeds on all streets, 35 mph; Vehicle Mix: 98% Autos/ 1.5% Medium Trucks/0.5% Heavy Trucks; Day-Night Split: 76% Day (7 a.m. to 7 p.m.), 12% Evening (7 p.m. to 10 p.m.), & 12% Night (10 p.m. to 7 a.m.). Background noise levels due to traffic on other roadways and non-traffic related activities are not reflected in these noise levels. Noise levels in this table are intended to indicate incremental noise changes due to future growth and project development. Since they do not include background noise levels, they do not necessarily reflect actual noise levels along these roadway segments.

Changes between scenarios may not add due to rounding in the noise modeling.

n/, s/, e/ w/ - North of, South of, East of, and West of, respectively.

Source: Orion Environmental Associates, 2007.

by up to 3.3 dBA under Option A, 3.5 dBA under Option B, and 3.6 dBA under Option C. The largest increases would occur on 16th Street and Mariposa Street in the Central Waterfront neighborhood, under all options. At or near both of these locations, traffic would pass through and/or by anticipated residential development, which is generally considered noise-sensitive. Because the cumulative noise increases at two of the modeled locations would exceed 3 dBA,

these increases would be perceptible. Traffic generated by development anticipated to result from the proposed project would contribute up to 0.8 dBA of the noise increase under Option C, up to 0.6 dBA of the increase under Option B, and up to 0.4 dBA under Option A. Although the cumulative noise increase would be greater than the 3-dBA threshold, none of the proposed rezoning options' contributions would be "considerable" within the meaning of CEQA, because the cumulative peak-hour noise levels would, in each case where the cumulative increase would exceed 3 dBA, be less than 70 dBA, which is the exterior noise level at which it is typically possible to maintain acceptable residential interior noise levels without special noise attenuation features (see section below on Noise Compatibility of Future Development), and because the contribution under each of the proposed rezoning options would be less than 1 dBA in each case, which is not a perceptible change. Therefore, the cumulative noise increases of up to 3.6 dBA are considered to be less than significant.

Noise Compatibility of Future Development

Figures 17 and 18 indicate that areas adjacent to or near freeways are subject to noise levels above 70 dBA (Ldn), while areas adjacent to some most major streets in the project area are subject to noise levels between 65 and 70 dBA (Ldn) at 100 feet from the centerline of the street. In areas adjacent to the freeways, noise levels could approach 80 dBA (Ldn) in some areas, based on noise measurements collected at other freeway locations.

The *San Francisco General Plan* noise guidelines (Figure 19) indicate that any new residential construction or development in areas with noise levels above 60 dBA (Ldn) should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features are included in the design. In areas where noise levels exceed 65 dBA (Ldn), new residential construction or development is generally discouraged, but if it does proceed, a detailed analysis of noise reduction requirements must be done and needed noise insulation features included in the design. Therefore, a detailed analysis of noise reduction requirements should be completed for all future residential and hotel uses proposed in areas subject to noise levels above 60 dBA (Ldn). Since noise measurements indicate noise levels exceed 60 dBA (Ldn) along almost all streets in the project area and in areas where most new residential development is expected to occur with implementation of the proposed rezoning, noise compatibility impacts would be potentially significant and a detailed noise analysis would be required for residential development proposed in the project area to reduce these impacts to a less-than-significant level.

However, because most new residential development that would be allowed within the project area by the proposed rezoning would be attached, multi-family residential units, most new residential development in the Eastern Neighborhoods would be subject to Title 24 Noise Insulation requirements. This state regulation requires meeting an interior standard of 45 dBA (Ldn) in any habitable room and, where such units are proposed in areas subject to noise levels greater than 60 dBA (Ldn), demonstrating how dwelling units have been designed to meet this

interior standard. Therefore, compliance with the state noise standards would ensure consistency with the *General Plan* noise standards for most new residential development in the project area.

For residential development not subject to the California Noise Insulation Standards (e.g., single-family dwellings), traffic noise in the study area could potentially result in a significant effect if interior noise were not adequately reduced, consistent with the state standards for multi-family housing. Implementation of Mitigation Measure F-3, p. 508, would require that residential development not subject to the California Noise Insulation Standards would undergo appropriate noise analysis prior to approval and construction, thereby avoiding the potential significant impact of exposure to noise levels in excess of *General Plan* recommendations. It should be noted that in areas with noise levels up to 70 dBA (Ldn), conventional construction but with closed windows and fresh air supply systems or air conditioning will normally be adequate to maintain acceptable interior noise levels (45 dBA, Ldn). Additional noise attenuation features may need to be incorporated into the building design where noise levels exceed 70 dBA (Ldn) to ensure that acceptable interior noise levels can be achieved.

Other noise-sensitive land uses, such as schools, libraries, churches and hospitals, where the *General Plan*-recommended threshold for detailed noise reduction analysis is 65 dBA (Ldn), would be subject to this noise recommendation at many locations in the in the study area. Because such special-purpose uses are frequently subject to particular design and construction standards, it is similarly anticipated that consistency with the *General Plan* recommendations would occur as a matter of course, in many instances. However, without adequate design, such uses could be subject to potentially significant impacts due to traffic-generated noise. To avoid the potential significant impact of exposure of such uses to noise levels in excess of *General Plan* recommendations, Mitigation Measure F-3 would ensure that such uses would undergo appropriate noise analysis prior to approval and construction. Likewise, Mitigation Measure F-3 would avoid potentially significant noise impacts to other new development in the project area by ensuring appropriate noise analysis, consistent with the *General Plan* noise guidelines for land use compatibility.

In general, the proposed rezoning and area plans would tend to rationalize the arrangement of land use in the Eastern Neighborhoods so that new residential uses would be less likely to locate in proximity to new noise-generating PDR uses than is the case under existing conditions or under future No-Project conditions absent the proposed rezoning. This is because the rezoning would more clearly delineate Employment and Business Development (EBD), mixed-use residential, and neighborhood commercial districts and would tend to concentrate these uses in designated areas and corridors to a greater degree than under the existing M-1 and M-2 zoning, which is more permissive in that it allows all major land use categories. Because the proposed controls would more clearly define areas intended for residential and PDR uses, the rezoning would tend to result, over time, in fewer land use conflicts between noise generators and residential and other more noise-sensitive uses. That is, under the proposed rezoning, new

residential uses would not be permitted in EDB zones, which would be reserved exclusively for PDR uses (e.g., light industrial, transportation/distribution, and other uses) that tend to generate operational noise, unlike conditions under existing and future No-Project zoning, in which residential development is permitted (with conditional use authorization) in C-M, M-1, and M-2 (heavy commercial and industrial) zones. The project would also create defined transitions between residential and non-residential areas through the UMU district, which would serve as a transitional buffer zone between unlike uses.

However, because the proposed rezoning would permit existing uses to remain where they are, existing PDR uses would remain, to a greater or lesser degree, in some areas newly zoned for mixed residential and other uses. Thus, particularly in the short term, the project would facilitate some residential development in proximity to a mix of uses including PDR uses that can generate operational noise, as well as other non-residential uses such as retail and entertainment, cultural/institutional/educational uses, and offices. Sources of noise typically associated with such non-residential uses can include loading/unloading activities, delivery trucks, parking cars, garbage trucks, and use of refuse bins. Stationary sources of noise from such uses can include refrigeration, air conditioning, and heating units. Depending on the type of commercial or employment activities, noise generated during the evening or nighttime hours can result in noise conflicts between residential and commercial uses.

As noted in the setting, these uses sometimes generate high short-term (or long-term) noise levels that could prove disruptive to occupants of new residential development that would be permitted as a result of the proposed rezoning, particularly where existing industrial or heavy commercial use districts are rezoned to Mixed-Use Residential (MUR) or Urban Mixed-Use (UMU) districts. Residential development in proximity to existing noisy uses could result in health effects associated with exposure to chronic high levels of environmental noise and with exposure to short term accidences in noise occurring during the typical hours of sleep, including sleep disturbance, annoyance, impaired speech comprehension, and possible changes in cognitive function. Moreover, the interior noise protections required by Title 24 will not protect the entire population from the health effects (e.g. sleep disturbance) of short-term exceedances of ambient noise levels, because Title 24 standards are based on 24-hour noise levels and short-term noise sources often have little effect on these day-night average noise levels. These short-term exceedances of ambient noise levels would result in a potentially significant effect on nearby sensitive receptors, if present in proximity to the noise sources. (See also the discussion under “Impacts on Regulatory Compliance by Existing Commercial Uses,” p. 322, below.)

Implementation of Mitigation Measure F-4, p. 508, would reduce such potential conflicts between existing noise-generating uses and new sensitive receptors by requiring evaluation of the noise environment around any site where a noise-sensitive use is proposed, in advance of the first approval of such use. Likewise, implementation of Mitigation Measure F-5, p. 508, would reduce potential conflicts between new noise-generating uses and existing noise-sensitive uses. Together,

these measures, along with Mitigation Measure F-3, would reduce noise impacts of potentially incompatible uses to a less-than-significant level.

Depending on the type and design of residential development proposed, outdoor areas associated with residential uses could also be exposed to noise levels above 60 dBA (Ldn). Very often, residential developments provide a roof deck or an interior courtyard that provides a noise-protected location for exterior recreation. Where such features are included, balconies associated with each residential unit are considered an architectural feature, not an outdoor recreational area that must comply with the San Francisco Land Use Compatibility Guidelines for Community Noise. However, these exterior features could be subject to potentially significant noise impacts if located in particularly noisy locations. Potential effects on such areas would be minimized through implementation of Mitigation Measures F-3, F-4, and F-5. In addition, implementation of Mitigation Measure F-6, p. 509, would specifically reduce, to the extent feasible, noise impacts associated with open space areas of residential units and other noise-sensitive uses. Together, these measures would reduce potential impacts on exterior residential features to a less-than-significant level.

East SoMa

Noise levels along the I-80 freeway as well as the segments of The Embarcadero, Third Street, and Fourth Street located within this neighborhood would have noise levels above 70 dBA (Ldn; see Figure 18). Noise levels along almost all other streets within this area range between 65 and 70 dBA (Ldn). Future noise levels, with traffic increases along these streets, would be approximately the same.

In East SoMa, Option A would result in development of the least number of new noise-sensitive uses (e.g., residential and cultural/institutional/educational), while Option C would result in development of the greatest number of these uses. Most of the new residential development is anticipated to occur in the South Beach area and in portions of the westerly extension of East SoMa north of Harrison Street between Fifth and Seventh Streets. Where noise levels exceed 65 dBA (Ldn), the *General Plan's* Land Use Compatibility Guidelines (see Figure 18) would recommend that a detailed evaluation of noise reduction requirements be conducted for new residential uses and that needed noise reduction requirements be incorporated into the project design. Such analysis is required under Title 24 noise standards for multi-family housing; implementation of Mitigation Measure F-3 would ensure such analysis were undertaken for other residential uses. For most other noise-sensitive land uses (e.g., schools, churches, hospitals, and nursing homes), a detailed noise evaluation also would be required wherever noise levels exceed specified levels identified in the *General Plan* and incorporated into Mitigation Measure F-3. Compliance with Title 24 Noise Insulation requirements and implementation of Mitigation Measures F-3, F-4, and F-5 would ensure that interior noise levels are maintained at acceptable

levels and potential noise impacts on future residences or other noise-sensitive uses would be reduced to less-than-significant levels.

Mission

Figure 18 indicates that the U.S. 101 freeway (located immediately east of this neighborhood) as well as the segments of Mission Street, South Van Ness Avenue, 13th Street, 16th Street, and César Chávez Street that traverse this neighborhood have noise levels above 70 dBA (Ldn). Folsom and Bryant streets have noise levels between 65 and 70 dBA (Ldn), while most other streets within this neighborhood have noise levels ranging between 60 and 65 dBA (Ldn). There are a few street segments with noise levels below 60 dBA (Ldn).

In the Mission, Option A would also result in development of the least number of new noise-sensitive uses (e.g., residential and cultural/institutional/educational), while Option C would result in development of the greatest number of these uses. With the proposed rezoning, it is expected that much of the new residential development would occur in the already mixed-use Mission Street corridor, with additional new residential development along the corridor between South Van Ness Avenue and Bryant Streets, south of 17th Street. There would also be some residential growth around the southern and western edges of the Northeast Mission Industrial Zone, although the NEMIZ proper would not be anticipated to see substantial new residential development. Thus, future residential development would be primarily concentrated in existing mixed-use residential districts, and noise levels would be similar to those that already exist in such districts. Still, some parts of the Mission, such as Mission Street itself, already have noise levels that would be considered marginally acceptable for future noise-sensitive uses such as residences (see Figure 18). In such areas, a detailed analysis of noise reduction requirements would be recommended by the *General Plan's* Land Use Compatibility Guidelines (see Figure 19). Compliance with Title 24 requirements (applicable to attached residences) and implementation of Mitigation Measures F-3, F-4, and F-5 would reduce this potentially significant impact to a less-than-significant level.

Effects under the *People's Plan* would be similar to those described above, as this variant does not propose substantial expansion of residential uses into non-residential areas. Under the MCEJJ plan, additional residential development could be permitted in the NEMIZ, similar to what would be permitted under rezoning Option C. As with the project analysis above, compliance with Title 24 requirements (applicable to attached residences) and implementation of Mitigation Measures F-3, F-4, and F-5 would reduce this potentially significant impact to a less-than-significant level.

Showplace Square/Potrero Hill

Noise levels along the U.S. 101 and I-280 freeways as well as along Potrero Avenue and a short segment of 16th Street have noise levels above 70 dBA (Ldn). Noise levels along streets north of

16th Street have noise levels between 65 and 70 dBA (Ldn). South of 16th Street, noise levels along most streets in this neighborhood range between 60 and 70 dBA (Ldn), while a few street segments have noise levels below 60 dBA (Ldn).

In the Showplace Square/Potrero Hill neighborhood, Option A would likewise result in development of the least number of new noise-sensitive uses (e.g., residential and educational), while Option C would result in development of the greatest number of these uses. It is expected that much of the new residential development that would be allowed by the proposed rezoning would occur in the northwestern portion of this neighborhood, generally along the Seventh Street corridor and the 16th/17th Streets corridor east of U.S. 101. Noise levels in this area are relatively high (above 70 dBA, Ldn) due to traffic on the U.S. 101 freeway. Also, noise levels along many of the streets north of 16th Street range from 65 to 70 dBA (Ldn), and the *General Plan* would generally encourage a detailed analysis of noise reduction requirements for new residential development in this area (see Figure 19). Compliance with Title 24 requirements (applicable to attached residences) and implementation of Mitigation Measures F-3, F-4, and F-5 would reduce this potentially significant impact to a less-than-significant level.

Central Waterfront

Noise levels along the I-280 freeway would exceed 70 dBA (Ldn). Figure 18 indicates that most streets in this area having noise levels between 65 and 70 dBA (Ldn), with some having noise levels between 60 and 65 dBA (Ldn). Noise levels along Third Street and other streets in this area exceed 65 dBA, and residential uses would generally be discouraged from these areas. Another source of noise along Third Street is light rail corridor, which as of spring 2007 is fully operational.

In the Central Waterfront, in contrast to the other neighborhoods, Option A would result in development of the greatest number of new noise-sensitive uses (e.g., residential and educational), while Option C would result in development of the least number of these uses. It is expected that much of the new residential development that would be allowed by the proposed rezoning would occur along and west of Third Street under all options in the northern and central portions of this neighborhood, generally expanding upon residential use in the Dogpatch area. Under Option A, the Potrero Power Plant site (east of Third Street) could be redeveloped with residential uses. While freeway noise is highest along the western margin of this neighborhood, noise compatibility would be of less concern because new residential development is not expected to occur in this vicinity as a result of the proposed rezoning. Noise levels in this part of the Central Waterfront are relatively high (above 70 dBA, Ldn) due to the presence of the U.S. 101 freeway. Because noise levels along many of the streets in this neighborhood exceed 65dBA (Ldn), the *General Plan's* Land Use Compatibility Guidelines (see Figure 19) would recommend that a detailed evaluation of noise reduction requirements be made for new residential development and recommended noise reduction measures incorporated into the project

design. Compliance with Title 24 requirements (applicable to attached residences) and implementation of Mitigation Measures F-3, F-4, and F-5 would reduce this potentially significant impact to a less-than-significant level.

Impacts on Regulatory Compliance by Existing Commercial Uses

As noted in the Setting, Section 2909 of the City's Police Code (noise ordinance) establishes a standard for fixed sources of noise, such as building mechanical equipment and industrial or commercial processing machinery that varies by time of day and by the zoning district in which the affected "receiver" of noise is located. Relatively higher noise levels are permitted in commercial, heavy commercial, and industrial use districts, compared to residential districts: the permitted noise level in the M-2 (Heavy Industrial) use district is 75 dbA, or 25 dBA higher than the maximum permitted nighttime noise level in existing low-density residential districts. As also noted in the Setting, the noise ordinance is not currently in correspondence with the Planning Code use districts, having not been amended to account for previously created mixed-use districts in SoMa (or in Chinatown), nor to Neighborhood Commercial zoning districts. Therefore, enforcement of the noise ordinance requires interpretation as to applicability of its standards.

Despite this uncertainty, it is likely that the proposed rezoning, by introducing mixed-use districts that permit dwelling units alongside commercial (and, in some cases, PDR) uses, would be subject to lower maximum noise levels than the industrial and heavy commercial districts that the new districts would replace. While this would not, in itself, create a adverse physical effect—the impact of fixed-source noises causing disturbance to noise-sensitive uses is discussed above under "Noise Compatibility of Future Development"—it would potentially create new violations of the Police Code, as businesses currently in compliance with the noise ordinance limits for industrial zones might not comply with the lower limits for mixed-use zones.

To address this issue, Improvement Measure F-1 would entail amendment of the City noise ordinance contained in the Police Code to ensure consistency with the Planning Code use districts, and to develop appropriate noise standards for mixed-use districts.

Conclusions

The proposed Eastern Neighborhoods Rezoning and Area Plans project would indirectly generate traffic that would incrementally increase traffic-generated noise levels on some streets in the project area, compared to both 2000 baseline and future (2025) No-Project conditions. The proposed project would also potentially expose some new residential units and other noise-sensitive uses in the project area to higher-than-desirable noise levels. However, implementation of Mitigation Measures F-3 through F-6 (see Chapter V) would reduce these impacts to a less-than-significant level.

G. Air Quality

Environmental Setting

Criteria Air Pollutants

As required by the 1970 federal Clean Air Act, the United States Environmental Protection Agency (EPA) has 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. EPA 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_2), sulfur dioxide (SO_2), and lead are the six criteria air pollutants.

The Bay Area Air Quality Management District (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 45** is a five-year summary of highest annual criteria air pollutant concentrations (2002 to 2006), collected at the BAAQMD's air quality monitoring station at 10 Arkansas Street in San Francisco, which is located in the Showplace Square/Potrero Hill neighborhood.[134] Table 45 compares measured pollutant concentrations with the most stringent applicable ambient air quality standards (state or federal).

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx). The main sources of ROG and NOx, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Table 45 shows that, according to published data, the most stringent applicable standards (state 1-hour standard of 9 parts per hundred million (pphm) and the federal 8-hour standard of 8 pphm) were not exceeded in San Francisco between 2002 and 2006.

[134] 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 45
SUMMARY OF SAN FRANCISCO AIR QUALITY MONITORING DATA (2002–2006)

Pollutant	Most Stringent Applicable Standard	Number of Days Standards were Exceeded and Maximum Concentrations Measured				
		2002	2003	2004	2005	2006
Ozone						
- Days 1-hour Std. Exceeded	>9 pphm[a]	0	0	0	0	0
- Max. 1-hour Conc. (pphm) [b]		5	9	9	6	5
- Days 8-hour Std. Exceeded	>8 pphm[b]	0	0	0	0	0
- Max. 8-hour Conc. (pphm) [b]		5	6	6	5	5
Carbon Monoxide (CO)						
- Days 1-hour Std. Exceeded	>20 ppm[a]	0	0	0	0	0
- Max. 1-hour Conc. (ppm)		3.5	3.6	2.9	2.9	2.9
- Days 8-hour Std. Exceeded	>9 ppm[a]	0	0	0	0	0
- Max. 8-hour Conc. (ppm)		2.6	2.8	2.2	2.1	1.7
Suspended Particulates (PM_{10})						
- Days 24-hour Std. Exceeded[c]	>50 µg/m^3 [a]	2	1	1	0	0
- Max. 24-hour Conc. (µg/m^3)		**74**	**52**	**52**	46	47
Suspended Particulates ($PM_{2.5}$)						
- Days 24-hour Std. Exceeded[d]	>35 µg/m^3 [b]	4	0	0	0	0
- Max. 24-hour Conc. (µg/m^3)		**70**	42	46	44	32
- Annual Average (µg/m^3)	>12 µg/m^3 [a]	**13.1**	10.1	9.9	9.5	ND
Nitrogen Dioxide (NO_2)						
- Days 1-hour Std. Exceeded	>25 pphm[a]	0	0	0	0	0
- Max. 1-hour Conc. (pphm) [b]		8	7	6	7	11
Sulfur Dioxide (SO_2)						
- Days 24-hour Std. Exceeded	>40 ppb[a]	0	0	0	0	0
- Max. 24-hour Conc. (ppb) [b]		6	7	6	7	7

Notes: 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.

[a] State standard, not to be exceeded.

[b] Federal standard, not to be exceeded.

[c] Based on a sampling schedule of one out of every six days, for a total of approximately 60 samples per year.

[d] Federal standard was reduced from 65 µg/m3 to 35 µg/m3 in 2006.

Source: BAAQMD, Bay Area Air Pollution Summary, 2002 – 2006.

Carbon Monoxide (CO)

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal. As shown in Table 45, no exceedances of state CO standards were recorded between 2000 and 2004.

Measurements of CO indicate hourly maximums ranging between 15 to 25 percent of the more stringent state standard, and maximum 8-hour CO levels approximately 30 percent of the allowable 8-hour standard.

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from manmade and natural sources. Particulate matter is measured in two size ranges: PM_{10} for particles less than 10 microns in diameter, and $PM_{2.5}$ for particles less than 2.5 microns in diameter. In the Bay Area, motor vehicles generate about half of the air basin's particulates, through tailpipe emissions as well as brake pad and tire wear. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of such fine particulates. These fine particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the state Air Resources Board (ARB), studies in the United States and elsewhere "have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks," and studies of children's health in California have demonstrated that particle pollution "may significantly reduce lung function growth in children." The ARB also reports that statewide attainment of particulate matter standards could prevent thousands of premature deaths, lower hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and avoid hundreds of thousands of episodes of respiratory illness in California.[135]

Among the criteria pollutants that are regulated, particulates appear to represent a serious ongoing health hazard. As long ago as 1999, the BAAQMD was reporting, in its CEQA Guidelines, that studies had shown that elevated particulate levels contribute to the death of approximately 200 to 500 people per year in the Bay Area. High levels of particulates have also been known to exacerbate chronic respiratory ailments, such as bronchitis and asthma, and have been associated with increased emergency room visits and hospital admissions.[136]

Table 45 shows that exceedances of the state PM_{10} standard have routinely occurred in San Francisco. It is estimated that the state 24-hour PM_{10} standard was exceeded between 1 and 7 days per year between 2000 and 2004. The BAAQMD began monitoring $PM_{2.5}$ concentrations in San Francisco in 2002. The federal 24-hour $PM_{2.5}$ standard was exceeded on four days in 2002, but not exceeded in 2003 or 2004. The state annual average standard was exceeded in 2002, but not exceeded in 2003 or 2004.

- Results of particulate monitoring in the Eastern Neighborhoods conducted for the City in connection with the San Francisco Electric Reliability Project are discussed on pp. 335 – 336.

[135] California Air Resources, Board, "Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution," January 2004. Available on the internet at: http://www.arb.ca.gov/research/health/fs/PM-03fs.pdf. This document is also available for review by appointment at the Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2004.0160E.

[136] BAAQMD, *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans.* December 1999; p. B-3. Available on the internet at: http://www.baaqmd.gov/pln/ceqa/ceqa_guide.pdf.

Nitrogen Dioxide (NO_2)

NO_2 is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. Table 45 shows that the standard for NO_2 is being met in the Bay Area, and pollutant trends suggest that the air basin will continue to meet these standards for the foreseeable future.

Sulfur Dioxide (SO_2)

SO_2 is a colorless acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease.[137] Table 45 shows that the standard for SO_2 is being met in the Bay Area, and pollutant trends suggest that the air basin will continue to meet these standards for the foreseeable future.

Lead

Leaded gasoline (phased out in the United States beginning in 1973), paint (on older houses, cars), smelters (metal refineries), and manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neurotoxic health effects; children are at special risk. Some lead-containing chemicals cause cancer in animals. Lead levels in the air have decreased substantially since leaded gasoline was eliminated.

Toxic Air Contaminants

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 in which human health exposure to toxic substances is estimated, and considered together with

[137] BAAQMD, *CEQA Guidelines,* op. cit.; p. B-2.

information regarding the toxic potency of the substances, to provide quantitative estimates of health risks.[138]

In addition to monitoring criteria pollutants, both the BAAQMD and the ARB operate TAC monitoring networks in the San Francisco Bay Area. These stations measure 10 to 15 TACs, depending on the specific station. The TACs selected for monitoring are those that have traditionally been found in the highest concentrations in ambient air, and therefore tend to produce the most significant risk. The BAAQMD operates an ambient TAC monitoring station at its Arkansas Street facility in San Francisco. When TAC measurements at this station are compared to ambient concentrations of various TACs for the Bay Area as a whole, the cancer risks associated with mean TAC concentrations in San Francisco were similar to those for the Bay Area as a whole (see **Table 46**). Therefore, the estimated average lifetime cancer risk resulting from exposure to TAC concentrations monitored at the San Francisco station do not appear to be any greater than for the Bay Area as a region.

TABLE 46
CANCER RISK DUE TO AVERAGE AMBIENT CONCENTRATIONS OF TOXIC AIR CONTAMINANTS MEASURED IN THE BAY AREA IN 2002

Gaseous TACs	Mean Concentration (ppb)[a]		Excess Cancer Risk[b]	
	Bay Area	San Francisco	Bay Area	San Francisco
Benzene	0.47	0.44	44.1	41.3
Carbon Tetrachloride	0.11	0.11	29.4	29.4
Perchloroethylene	0.05	0.06	2.0	2.4
Methylene Chloride	0.38	0.27	1.3	0.9
MTBE (Methyl Tertiary Butyl Ether)	0.75	0.61	0.7	0.6
Chloroform	0.02	0.02	0.5	0.5
Trichloroethylene	0.02	0.04	0.2	0.4

a ppb = parts per billion

b The "excess" cancer risk attributed to a particular contaminant is the incremental lifetime increase in an individual's risk of contracting cancer beyond that resulting from other factors.

SOURCE: BAAQMD, *Toxic Air Contaminant Control Program, Annual Report 2002, Volume I and Appendix C-1.* June 2004.

The EPA maintains a Toxic Release Inventory (TRI) Program for toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. The TRI Facility Report (2005) identifies three facilities in San Francisco that reported fugitive and point source air emissions. Total reported air emissions for all industries in San Francisco were 34,714 pounds (see **Table 47**). Two of the three identified facilities

138 In general, a health risk assessment is required 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.

TABLE 47
ON-SITE REPORTED RELEASES FOR ALL INDUSTRIES AND ALL CHEMICALS IN SAN FRANCISCO COUNTY IN 2005

Facility	Chemical	On-site Reported Releases (in pounds)		BAAQMD TAC Trigger Levels[1] (pounds/year)
		Fugitive Air Emissions	Point Source Air Emissions	
Mirant Potrero LLC, 1201-A Illinois Street	Naphthalene	0	2	5.3
Pacific Gas & Electric Co Hunters Point Power Plant, 1000 Evans Av.	Mercury	0	2	56
	N-Hexane	0	1	83,000
San Francisco Drydock, Inc., Foot of 20th Street	Copper Compounds	356	0	93
	N-Butyl Alcohol	20,294	0	None
	Xylene (Mixed Isomers)	14,059	0	27,000
Total		34,709	5	

[1] The "trigger level" is the level of release of a particular TAC above which BAAQMD regulations require that the District complete a site-specific Health Risk Screening Analysis as part of the permit process for new and modified sources of TACs.

Source: U.S. Environmental Protection Agency (EPA), *TRI Facility Report for San Francisco County, California, 2005.* Website Accessed on April 23, 2007: http://www.epa.gov/triexplorer/facility.htm.

(Mirant and San Francisco Drydock) are located in the Central Waterfront neighborhood, while the PG&E Hunters Point power plant, which ceased operations on May 15, 2006, is located to the south of the Eastern Neighborhoods planning area, in the Bayview Hunters Point neighborhood. Of the reported releases, the BAAQMD TAC trigger levels were not exceeded by either facility except for copper compound releases by San Francisco Drydock, Inc.

For comparison purposes, the TRI Chemical Report for Alameda County identifies 68 facilities with reported fugitive and point source air emissions in 2005 totaling 259,855 and 295,448 pounds, respectively, for all industries in Alameda County.[139] Comparable 2005 figures for San Mateo County were 5,436 and 9,949 pounds, respectively, from 20 facilities.

Diesel particulate matter, which is emitted in diesel engine exhaust, was identified as a toxic air contaminant by the ARB in 1998. Unlike TACs emitted from industrial and other stationary sources noted above, most diesel particulate matter is emitted from mobile sources—primarily "off-road" sources such as construction and mining equipment, agricultural equipment, and truck-mounted refrigeration units, as well as trucks and buses traveling on freeways and local

[139] The vast majority of these emissions were from the NUMMI automobile plant in Fremont.

roadways. Agricultural and mining equipment are not relevant to San Francisco, while construction equipment typically operates for a limited time at changeable locations. As a result, the readily identifiable locations where diesel particulate matter is emitted in the Eastern Neighborhoods study area include high-traffic roadways and other areas with substantial truck traffic. Therefore, diesel particulate matter is discussed further under "Roadway-Related Health Effects," p. 332, below.

"Greenhouse Gas" Emissions

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs). Both natural processes and human activities emit GHGs. The accumulation of GHGs in the atmosphere regulates the earth's temperature; however, emissions from human activities such as electricity production and vehicles have elevated the concentration of these gases in the atmosphere. This accumulation of GHGs has contributed to an increase in the temperature of the earth's atmosphere and contributed to climate change. The principal greenhouse gases are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. Carbon dioxide is the "reference gas" for climate change, meaning that emissions of GHGs are typically reported in "carbon dioxide-equivalent" measures.

The principal GHGs are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. Of these gases, carbon dioxide (CO_2) and methane are emitted in the greatest quantities from human activities. Emissions of carbon dioxide are largely by-products of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices and landfills. Other GHGs – with much greater heat-absorption potential than carbon dioxide – include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes. There is international scientific consensus that human-caused increases in GHGs has and will continue to contribute to global warming, although there is much uncertainty concerning the magnitude and rate of the warming.

Some of the potential impacts in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years.[140] Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects, according to the Intergovernmental Panel on Climate Change:[141]

[140] California Air Resources Board (ARB), 2006a. Climate Change website (http://www.arb.ca.gov/cc/120106workshop/intropres12106.pdf) accessed March 24, 2007.

[141] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: The Physical Science Basis; Summary for Policymakers*, February 5, 2007. Available on the internet at: http://www.ipcc.ch/SPM2feb07.pdf. The IPCC was established in 1988 by the World Meteorological Organization and the United Nations Environment

- Snow cover is projected to contract, with permafrost areas sustaining thawing.
- Sea ice is projected to shrink in both the Arctic and Antarctic.
- Hot extremes, heat waves, and heavy precipitation events are likely to increase in frequency.
- Future tropical cyclones (typhoons and hurricanes) will likely become more intense.
- Non-tropical storm tracks are projected to move poleward, with consequent changes in wind, precipitation, and temperature patterns. Increases in the amount of precipitation are very likely in high-latitudes, while decreases are likely in most subtropical regions.
- Warming is expected to be greatest over land and at most high northern latitudes, and least over the Southern Ocean and parts of the North Atlantic ocean.

There are also many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood, and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.

The California Energy Commission estimated that in 2004 California produced 500 million gross metric tons (about 550 million U.S. tons) of carbon dioxide-equivalent GHG emissions.[142] The CEC found that transportation is the source of 38 percent of the State's GHG emissions, followed by electricity generation (both in-state and out-of-state) at 23 percent and industrial sources at 13 percent.[143]

In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of the Bay Area's GHG emissions, accounting for just over half of the Bay Area's 85 million tons of GHG emissions in 2002. Industrial and commercial sources were the second largest contributors of GHG emissions with about one-fourth of total emissions. Domestic sources (e.g., home water heaters, furnaces, etc.) account for about 11 percent of the Bay Area's GHG emissions, followed by power plants at 7 percent. Oil refining currently accounts for approximately 6 percent of the total Bay Area GHG emissions.[144]

Programme to assess scientific, technical and socio- economic information relevant for the understanding of climate change, its potential impacts and options for adaptation and mitigation.

142 Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide-equivalents," which present a weighted average based on each gas's heat absorption (or "global warming") potential.

143 California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 - Final Staff Report*, publication # CEC-600-2006-013-SF, December 22, 2006; and January 23, 2007 update to that report. Available on the internet at: http://www.arb.ca.gov/cc/ccei/emsinv/emsinv.htm.

144 BAAQMD, *Source Inventory of Bay Area Greenhouse Gas Emissions: Base Year 2002*, November 2006. Available on the internet at: http://www.baaqmd.gov/pln/ghg_emission_inventory.pdf.

California has taken a leadership role in addressing the trend of increasing GHG emissions, with the passage in 2006 of California Assembly Bill 32 (AB 32), the Global Warming Solutions Act. This legislation is discussed below, under Regulatory Setting.

Sensitive Receptors

Land uses such as schools, children's day care centers, parks and playgrounds, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. (Exposure duration, and therefore overall exposure, at recreational uses is typically much shorter than for the other uses noted, but children are frequent users.) Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions compared to commercial and industrial areas because people generally spend longer periods of time at their residences, with associated greater exposure to ambient air quality conditions. Residential uses occur in all the Eastern Neighborhoods and comprise a broad proportion of the total area: East SoMa (19% of land is in residential use or residential mixed-use), Mission (56%), Showplace Square/Potrero Hill (44%), and Central Waterfront (2%). Recreational uses would also be considered sensitive compared to commercial and industrial areas due to the greater exposure to ambient air quality conditions. Parks and open spaces uses occur in all four Eastern Neighborhoods but comprise only a very small proportion of the total area: East SoMa (6% of land is in park and open space use), Mission (3%), Showplace Square/Potrero Hill (5%), and Central Waterfront (1%).

Public Health Effects Related to Air Quality

Increased cancer risk is associated with long-term exposure to certain criteria pollutants and toxic air contaminants, particularly diesel particulate matter. Chronic exposure to some criteria pollutants, such as particulate matter, increases the rate of bronchitis and mortality. Short-term exposure to criteria and non-criteria pollutants can cause or aggravate chronic respiratory disease such as asthma, bronchitis, and emphysema, and can impair the growth and development of children's lungs.

Asthma is one of the most common chronic respiratory disorders in the United States. The California Health Interview Survey (CHIS), conducted by the UCLA Center for Health Policy Research in collaboration with the California Department of Health Services and the Public Health Institute, provides the state's broadest overview of health issues, including asthma rates. By correlating CHIS asthma data with Caltrans traffic data, it was determined that children and adults who suffer from asthma and live near heavy vehicular traffic are nearly three times more likely to visit the emergency room or be hospitalized for their condition than those who live near low traffic density.[145]

[145] Meng, Ying-Ying, R.P. Rull, M. Wilhelm, B. Ritz, P. English, H. Yu, S. Nathan, M. Kuruvilla, E. Brown, UCLA Center for Health Policy Research Brief, Living Near Heavy Traffic Increases Asthma Severity. August 2006. In this study, traffic density was categorized into three levels based on residential traffic-density values, measured as

In 2001, the CHIS found that California's lifetime asthma prevalence, at 11.5 percent of the population, is higher than the national lifetime asthma prevalence of 10.1 percent.[146] When asthma symptom prevalence in 2001 is sorted by county, the CHIS found that people who live in rural areas have more frequent asthma symptoms. Asthma symptom prevalence by region ranged from 10.4 to 13.8 percent for all ages. The highest rates occurred in Northern California, Sierra, and Sacramento area counties (13.8 percent). The Bay Area region had a rate of 12.2 percent. These data indicate that asthma is a regional (not localized) problem. However, these regional statistics mask the fact that asthma rates are higher among African-Americans (16.2 percent) than among the rest of the population (7.0 to 13.1 percent), suggesting there may be asthma "hot spots" in some communities that are not well-characterized by regional averages.

In 2001, the San Francisco Board of Supervisors created an Asthma Task force to address how to prevent asthma incidence as well as morbidity. Asthma morbidity trends in San Francisco suggest recent success in addressing environmental and clinical factors responsible for asthma hospitalizations. At the same time, residents of the south eastern quadrant of San Francisco along with residents of the Tenderloin and Western Addition appear to suffer a disproportionate number of asthma hospitalizations.

Air quality does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects. Population subgroups sensitive to the health effects of air pollutants include the elderly and the young, population subgroups with higher rates of respiratory disease such as asthma and chronic obstructive pulmonary disease, and populations with other environmental or occupational health exposures (e.g. indoor air quality) that affect cardiovascular or respiratory diseases. The factors responsible for variation in exposure are also often similar to factors associated with greater susceptibility to air quality health effects. For example, poorer residents may be more likely to live in crowded substandard housing and be more likely to live near industrial or roadway sources of air pollution.

Roadway-Related Health Effects

Motor vehicles are responsible for a large share of air pollution especially in California. Consistent with the theory that proximity to air pollution sources is likely to increase both relative exposure and hazards, epidemiologic studies have consistently demonstrated that children and adults living in proximity to freeways or busy roadways have poorer health outcomes, including increased asthma symptoms and respiratory infections and decreased pulmonary function and lung development in children.[147] Air pollution monitoring done in conjunction with

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Vehicle Miles Traveled (VMT) per square mile. High traffic exposure = >200,000 daily VMT/square mile; medium traffic exposure = 20,000 to 200,000 VMT/square mile; low traffic exposure = <20,000 VMT/square mile.

146 "Lifetime asthma prevalence" includes people diagnosed with asthma at some point in their lives, while "asthma symptom prevalence" includes those who experience asthma symptoms at least once per year.

147 For additional information, please see Appendix C, Public Health Effects Related to Air Quality.

epidemiological studies has confirmed that roadway related health effects vary with modeled exposure to particulate matter and nitrogen dioxide. However, at this time, it is not possible at this time to attribute roadway related health effects to a single type of roadway, vehicle, or type of fuel. Vehicle tailpipe emissions contain diverse forms of particulate matter as well as well as ozone precursor compounds such as nitrogen oxides (NOx) and volatile organic compounds (VOC). Vehicles also contribute to particulates by generating road dust and through tire wear.

Recent air pollution studies have shown an association between respiratory and other non-cancer health effects and proximity to high traffic roadways. The ARB community health risk assessments and regulatory programs have produced air quality information about certain types of facilities for consideration by local authorities when siting new residences, schools, day care centers, parks and playgrounds, and medical facilities (i.e., sensitive land uses). Sensitive land uses deserve special attention because children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the non-cancer effects of air pollution. There is also substantial evidence that children are more sensitive to cancer-causing chemicals.[148]

In traffic-related studies, the additional non-cancer health risk attributable to roadway proximity was seen within 1,000 feet of the roadway and was strongest within 300 feet. California freeway studies show about a 70 percent drop-off in particulate pollution levels at 500 feet from the roadway. Therefore, the ARB recommends that new sensitive land uses (e.g., residences, schools, daycare centers, parks and playgrounds, and medical facilities) not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day. This recommendation is put forth to minimize potential non-cancer health effects of exposure to pollutants known to increase incidence of asthma and other respiratory ailments, particularly fine particulates, as well as cancer risk from exposure to diesel particulates from truck and bus exhaust (discussed below) and benzene and 1,3-butadine from automobile exhaust. In addition, SB351 (adopted in 2003) specifically prohibits locating public schools within 500 feet of a freeway or busy traffic corridor. The ARB similarly recommends that sensitive land uses not be located within 1,000 feet of a distribution center (warehouse) that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs)[149] per day, or where TRU unit operations exceed 300 hours per week; within 300 feet of dry cleaners using perchloroethylene; and within 300 feet of large gas stations (those that pump more than 10,000 gallons per day) or 50 feet of smaller gas stations. Other recommendations not directly applicable to the project area include avoiding placement of sensitive receptors immediately downwind of ports[150] in areas most seriously affected by DPM emissions, as well as avoiding refineries, chrome platers, and rail yards.

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[148] California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective,* April 2005. Available on the internet at: http://www.arb.ca.gov/ch/handbook.pdf.

[149] TRUs are typically diesel-powered, which is why they are included here as a risk factor. As with diesel engines in general, TRUs will become cleaner-running over time as a result of air toxic control measures adopted by ARB.

[150] The Port of San Francisco is downwind of the project area in generally prevailing winds.

The ARB notes that these recommendations are advisory and should not be interpreted as defined "buffer zones." ARB acknowledges that land use agencies must balance other considerations, including housing and transportation needs, the benefits of urban infill, community economic development priorities, and other quality of life issues. With careful evaluation of exposure, health risks, and affirmative steps to reduce risk where necessary, ARB's position is that infill development, mixed-use, higher density, transit-oriented development, and other concepts that benefit regional air quality can be compatible with protecting the health of individuals at the neighborhood level.[151]

Diesel Particulate Matter

Diesel exhaust is a toxic air contaminant (TAC) that is of growing concern throughout California. The ARB identified diesel particulate matter (DPM) as a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans.[152] The exhaust from diesel engines include hundreds of different gaseous and particulate components, many of which are toxic. Many of these toxic compounds adhere to the diesel particles, which are very small and can penetrate deeply into the lungs. Mobile sources such as trucks, buses, and, to a much lesser extent, automobiles are some of the primary sources of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections. DPM is the TAC most relevant to the proposed Eastern Neighborhoods Rezoning and Area Plans, both because of pre-existing industrial and commercial uses dependent on heavy duty trucks and because of freeways and designated trucking corridors.

The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other toxic air pollutant routinely measured in the region. The ARB estimated the average Bay Area cancer risk from diesel particulate, based on a population-weighted average ambient diesel particulate concentration, at about 480 in one million, as of 2000. The risk from diesel particulate matter has declined from 750 in one million in 1990 and 570 in one million in 1995. ARB estimated the average statewide cancer risk from DPM at 540 in one million in 2000.[153,154] Other studies have shown that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for much of the cumulative cancer risk from airborne toxics in California. Diesel exhaust also contains pulmonary irritants and hazardous compounds that could affect non cancer health effects in sensitive receptors such as young children, senior

[151] Ibid.
[152] California Air Resources Board, Fact Sheet, "The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines." October 1998. Available on the internet at: http://www.arb.ca.gov/toxics/dieseltac/factsht1.pdf. This document is also available for review by appointment at the Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2004.0160E.
[153] ARB, *California Almanac of Emissions and Air Quality - 2006 Edition*, Table 5-43 and Figure 5-11. Available on the internet at: http://www.arb.ca.gov/aqd/almanac/almanac06/pdf/chap506.pdf. Viewed February 10, 2007.
[154] This calculated cancer risk values from ambient air exposure in the Bay Area can be compared against the lifetime probability of being diagnosed with cancer in the United States, from all causes, which is more than 40 percent (based on a sampling of 17 regions nationwide), or greater than 400,000 in one million, according to the National Cancer Institute.

citizens, or those susceptible to chronic respiratory disease such as asthma, bronchitis, and emphysema.

To begin to evaluate the hazard of DPM in the Eastern Neighborhoods study area, a limited program of air quality monitoring was undertaken at four sites in an adjacent to the study area for several weeks in November and December 2006, and January 2007. Three of the sites were within about 300 feet of the elevated I-80 freeway in the South of Market area, while the fourth site was just outside the northwest corner of the Mission area, about 450 feet southwest of the newly reconstructed Central Freeway ramp that connects with Octavia Boulevard.

Because there are no methods of testing for diesel exhaust available on a routine basis, black carbon (also known as elemental carbon) was chosen as a surrogate for DPM. All incomplete combustion processes produce black carbon. In an urban area, these sources can include fireplaces, non-diesel (gasoline) engines, and power plants. Diesel particulate contains relatively high concentrations of black carbon, and for locations near heavy volumes of truck traffic, black carbon may be used as an "indicator" for DPM.

The results of the black carbon monitoring were somewhat inconclusive, and suggest the limitations of limited direct measurements in assessing DPM risk. Based on the measurements, it appears that in a developed urban area, there may be a more complicated relationship between proximity to a freeway and elevated readings of DPM, and that a freeway's contribution to overall concentrations of diesel particulate may be less substantial, on a relative basis, than for freeways in more isolated locations, where the roadway would be the clearly dominant source of DPM. In a developed area like San Francisco – and particularly in the Eastern Neighborhoods, where many streets carry relatively higher volumes of truck traffic, other sources of DPM, including trucks and buses on nearby streets, as well as construction equipment, contribute to overall concentrations of diesel exhaust that are most likely higher than in less developed locations, but to which the freeway contributes, in relative terms, a smaller percentage. While there is no doubt that truck traffic on the elevated freeways in and near the Eastern Neighborhoods is a contributor to nearby concentrations of DPM, numerous other sources throughout the project are also have an impact, and the impact of freeway traffic may not be as clearly implicated as a predominant factor in local diesel particulate concentrations.

The inconclusive nature of the above monitoring study is consistent with recent micro-environmental air quality assessments of particulate matter in the Eastern Neighborhoods

- conducted by the San Francisco Public Utilities Commission (SFPUC) using portable particulate
- matter measurement devices. This second monitoring study was undertaken for the City in connection with the San Francisco Electric Reliability Project, a proposal for a new power plant in the Central Waterfront that is anticipated to result in eventual closure of the existing Potrero Power Plant. It aimed to compare the air quality measurements for PM_{10} and $PM_{2.5}$ from several community stations with the measurements from the BAAQMD's permanent monitoring station at Arkansas Street (near Showplace Square) and determine whether the Arkansas Street station is collecting data that is representative of community exposure. Monitoring began in early July 2005 and continued through late March

2006. Monitoring took place at two locations in Bayview/Hunters Point and two locations in the Central Waterfront at sites were chosen to be representative of community exposures. Monitoring demonstrated that particulate matter measures (as an annual average) ranged from 16.9 to 20 micrograms per cubic meter for PM_{10} and from 7.6 to 9.3 micrograms per cubic meter for $PM_{2.5}$. As noted in Table 45, the state standard for annual average $PM_{2.5}$ concentration is 12 micrograms per cubic meter; the comparable standard for PM_{10} is 20 micrograms per cubic meter.

According to the San Francisco Department of Public Health (DPH), these findings indicate that there is a substantial variation in particulate matter levels in the Eastern Neighborhoods. However, the measured levels of particulate matter do not exceed state standards at any of the monitored sites. DPH attributes the spatial variation in particulate matter levels to (1) known sources of particulate emissions, including heavily trafficked urban roadways, (2) "urban canyon" effects,[155] and (3) PDR uses such as distribution centers. According to DPH, variations in weather also affect pollution concentrations on a seasonal basis.

In 2000, the ARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. The Plan aims to develop and implement specific statewide regulations designed to reduce DPM emissions and the associated health risk 75 percent by 2010 and 85 percent by 2020. In addition to implementing more stringent engine controls (diesel engines produced today have one-eighth the tailpipe exhausts of a truck or bus built in 1990), diesel fuel is required to have lower sulfur levels. As of June 1, 2006, at least 80 percent of on-road diesel fuel refined in the United States must be ultra-low sulfur diesel, which reduces sulfur emissions by 97 percent. All of the diesel fuel sold in California for use with on-road trucks is now ultra-low sulfur diesel. With new controls and fuel requirements, 60 trucks built in 2007 would have the same soot exhaust emissions as one truck built in 1988.[156]

Despite these dramatic reductions in emission rates, reducing DPM emissions will take time since older trucks will need to be retrofitted or phased out as part of fleet turnover. While these efforts are reducing diesel particulate emissions on a statewide basis, they do not yet capture every site where diesel vehicles and engines operate. As a result, the ARB recommends that proximity to sources of DPM emissions be considered in the siting of new development. For example, as noted above, ARB's guidance is that new sensitive land uses (e.g., residences, schools, daycare centers, playgrounds, or medical facilities) not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day.

[155] Large buildings in urban areas can create "canyons" that affect air flow.

[156] Pollution Engineering, *New Diesel Fuel Rules Start,* website accessed on October 30, 2006: http://www.pollutioneng.com/CDA/.

Regulatory Setting

Air Quality Regulations and Plans

Federal Ambient Air Quality Standards

The 1970 Clean Air Act (last amended in 1990, 42 United States Code [USC] 7401 et seq.) required that regional planning and air pollution control agencies prepare a regional air quality plan to outline the measures by which both stationary and mobile sources of pollutants will be controlled in order to achieve all standards by the deadlines specified in the Clean Air Act. The ambient air quality standards are intended to protect the public health and welfare, and they specify the concentration of pollutants (with an adequate margin of safety) to which the public can be exposed without adverse health effects. They are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics, the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels that are somewhat above the ambient air quality standards before adverse health effects are observed.

The current attainment status for the San Francisco Bay Area Air Basin with respect to federal standards is summarized in **Table 48**. In general, the Bay Area Air Basin experiences low concentrations of most pollutants when compared to federal standards, except for ozone and particulate matter (PM_{10} and $PM_{2.5}$), for which standards are exceeded periodically. The Bay Area Air Basin's attainment status for ozone has changed several times over the past decade, first from "nonattainment" to "attainment" in 1995, then back to "unclassified nonattainment" in 1998 for the 1-hour federal ozone standard. In June 2004, the Bay Area Air Basin was designated as "marginal nonattainment" for the 8-hour ozone standard. In June 2005, the U.S. EPA revoked the federal 1-hour ozone standard, although the 8-hour standard is still in effect. The attainment deadline for "marginal nonattainment" areas for the 8-hour federal ozone standard is June 2007. In 1998, after many years without violations of any CO standards, the attainment status for CO was upgraded to "attainment." The Bay Area Air Basin is in attainment for other criteria pollutants, with the exception of PM_{10}, for which the Bay Area is designated "Unclassified."

State Ambient Air Quality Standards

Although the federal Clean Air Act established national ambient air quality standards, individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when federal standards were established, and because of the unique meteorological problems in California, there is considerable diversity between the state and national ambient air quality standards, as shown in Table 48. California ambient standards tend to be at least as protective as national ambient standards and are often more stringent.

TABLE 48
STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS

		(State) SAAQs[a]		(Federal) NAAQs[b]	
Pollutant	**Averaging Time**	**Standard**	**Attainment Status**	**Standard**	**Attainment Status**
Ozone	1 hour	0.09 ppm	**N**	NA	See Note c
	8 hour	0.07 ppm	U[d]	0.08 ppm	**N**/Marginal
Carbon Monoxide (CO)	1 hour	20 ppm	A	35 ppm	A
	8 hour	9 ppm	A	9 ppm	A
Nitrogen Dioxide (NO_2)	1 hour	0.25 ppm	A	NA	NA
	Annual	NA	NA	0.053 ppm	A
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	A	NA	NA
	24 hour	0.04 ppm	A	0.14 ppm	A
	Annual	NA	NA	0.03 ppm	A
Particulate Matter (PM_{10})	24 hour	50 µg/m^3	N	150 µg/m^3	U
	Annual[e]	20 µg/m^3 [f]	N	50 µg/m^3	A
Fine Particulate Matter ($PM_{2.5}$)	24 hour	NA	NA	35 µg/m^3	U
	Annual	12 µg/m^3	N	15 µg/m^3	A
Sulfates	24 hour	25 µg/m^3	A	NA	NA
Lead	30 day	1.5 µg/m^3	A	NA	NA
	Cal. Quarter	NA	NA	1.5 µg/m^3	A
Hydrogen Sulfide	1 hour	0.03 ppm	U	NA	NA
Visibility-Reducing Particles	8 hour	See Note g	A	NA	NA

NOTES: A = Attainment; **N** = Nonattainment; U = Unclassified; NA = Not Applicable, no applicable standard;= ppm = parts per million; µg/m^3 = micrograms per cubic meter.

a SAAQs = state ambient air quality standards (California). SAAQS for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All other state standards shown are values not to be equaled or exceeded.

b NAAQs = national ambient air quality standards. NAAQS, other than ozone and particulates, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The 8-hour ozone standard is attained when the three-year average of the fourth highest daily concentration is 0.08 ppm or less. The 24-hour PM10 standard is attained when the three-year average of the 99th percentile of monitored concentrations is less than the standard. The 24-hour PM2.5 standard is attained when the three-year average of the 98th percentile is less than the standard.

c The U.S. EPA revoked the national 1-hour ozone standard on June 15, 2005.

d This state 8-hour ozone standard was approved in April 2005 and became effective in May 2006.

e State standard = annual geometric mean; national standard = annual arithmetic mean.

f In June 2002, The California Air Resources Board (ARB) established new annual standards for PM2.5 and PM10.

g Statewide visibility-reducing particle standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

SOURCE: Bay Area Air Quality Management District (BAAQMD), Standards and Attainment Status, May 2006. Website Accessed on October 28, 2006: http://www.baaqmd.gov/pln/air_quality/ambient_air_quality.htm.

In 1988, California passed the California Clean Air Act (California Health and Safety Code Sections 39600 et seq.), which, like its federal counterpart, called for the designation of areas as attainment or nonattainment, but based on state ambient air quality standards rather than the federal standards. As indicated in Table 48, the Bay Area Air Basin is designated as "nonattainment" for state ozone, PM_{10}, and $PM_{2.5}$ standards. The Bay Area Air Basin is designated as "attainment" for all other pollutants listed in the table.

California Air Resources Board

The ARB is the state agency responsible for regulating air quality. The ARB's responsibilities include establishing state ambient air quality standards, emissions standards, and regulations for mobile emissions sources (e.g., autos, trucks, etc.), as well as overseeing the efforts of countywide and multi-county air pollution control districts, which have primary responsibility over stationary sources.

Bay Area Air Quality Management District

The BAAQMD is the regional agency responsible for air quality regulation within the Bay Area Air Basin. The BAAQMD regulates air quality through its planning and review activities. The district has permit authority over most types of stationary emission sources and can require stationary sources to obtain permits; it can also impose emission limits, set fuel or material specifications, or establish operational limits to reduce air emissions. The BAAQMD regulates new or expanding stationary sources of toxic air contaminants.

State Standards. In January 2006, the BAAQMD, in cooperation with the MTC and ABAG, adopted the *Bay Area 2005 Ozone Strategy.* The Ozone Strategy is a roadmap showing how the San Francisco Bay Area will achieve compliance with the state 1- hour ozone standard as expeditiously as practicable, and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The control strategy includes stationary-source control measures to be implemented through BAAQMD regulations; mobile-source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with the MTC, local governments, transit agencies, and others. The *2005 Ozone Strategy* also represents the Bay Area's most recent triennial assessment of the region's strategy to attain the state one-hour ozone standard. In this, the *2005 Ozone Strategy* replaces the *2000 Clean Air Plan (CAP)*. Like the *2000 CAP* and prior versions thereof, the *2005 Ozone Strategy* continues to implement and expand key mobile-source emissions control, including 19 transportation control measures. Although an ozone-control plan, the *2005 Ozone Strategy* also includes information concerning particulate matter.

Federal Standards. In response to the U.S. EPA redesignation of the basin for the 1-hour federal ozone standard to nonattainment, the BAAQMD, Association of Bay Area Governments (ABAG), and Metropolitan Transportation Commission (MTC) were required to develop an

ozone attainment plan to meet this standard. The *1999 Ozone Attainment Plan* was prepared and adopted by these agencies in June 1999. However, in March 2001, the U.S. EPA proposed and took final action to approve portions of the 1999 ozone plan and disapprove other portions, while also making the finding that the Bay Area had not attained the national 1-hour ozone standard. As a result, a revised Ozone Attainment Plan was prepared and adopted in October 2001. The 2001 Ozone Attainment Plan amends and supplements the 1999 plan. The 2001 Ozone Attainment Plan contains control strategies for stationary and mobile sources. The adopted mobile-source control program was estimated to significantly reduce volatile organic compound and NOx emissions between 2000 and 2006, reducing emissions from on- and off-road diesel engines (including construction equipment). In addition to emission reduction requirements for engines and fuels, the 2001 Ozone Attainment Plan identified 28 transportation control measures to reduce automobile emissions, including improved transit service and transit coordination, new carpool lanes, signal timing, freeway incident management, and increased state gas tax and bridge tolls.

San Francisco General Plan Air Quality Element

The Air Quality Element of the *San Francisco General Plan* is composed of six sections, each of which focuses on different aspects of air quality improvement efforts. Applicable General Plan policies are discussed in IV.B, Plans and Policies.

Toxic Air Contaminants

In 2005, the ARB approved a regulatory measure to reduce emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles, which altered five sections of Title 13 of the California Code of Regulations. The relevant changes are Sections 2480 and 2485, which limit idling of commercial motor vehicles (including buses and trucks) within 100 feet of a school or residential area for more than five consecutive minutes or periods aggregating more than five minutes in any one hour.[157] Buses or vehicles also must turn off their engines upon stopping at a school and must not turn their engines on more than 30 seconds before beginning to depart from a school. As noted above under Public Health Effects Related to Air Quality, state law prohibits locating public schools within 500 feet of a freeway or busy traffic corridor.

Greenhouse Gases

Assembly Bill 32

In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide emission of GHG would be progressively reduced, as follows: by 2010, reduce

[157] There are 12 exceptions to this requirement (e.g., emergency situations, military, adverse weather conditions, etc.), including: when a vehicle's power takeoff is being used to run pumps, blowers, or other equipment; when a vehicle is stuck in traffic, stopped at a light, or under direction of a police officer; when a vehicle is queuing beyond 100 feet from any restricted area; or when an engine is being tested, serviced, or repaired.

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.

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), which requires the ARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions).

Greenhouse Gas Emissions Limits. AB 32 establishes a timetable for the ARB to adopt emission limits, rules, and regulations designed to achieve the intent of the Act, as follows:[158]

- Publish a list of discrete early action GHG emission reduction measures by June 30, 2007.
- Establish a statewide GHG emissions cap for 2020, equivalent to the 1990 emissions level by January 1, 2008.
- Adopt mandatory reporting rules for significant sources of GHGs by January 1, 2008.
- Adopt a scoping plan by January 1, 2009, indicating how GHG emission reductions will be achieved from significant GHG sources via regulations, market-based compliance mechanisms and other actions, including the recommendation of a *de minimus* threshold for GHG emissions, below which emission reduction requirements would not apply.
- Adopt regulations by January 1, 2011 to achieve the maximum technologically feasible and cost-effective reductions in GHGs, including provisions for using both market-based and alternative compliance mechanisms.
- Establish January 1, 2012 as the date by which all regulations adopted prior to January 1, 2010 are to become operative (enforceable).

The ARB is proposing "Early Action Measures" in three groups; together, these measures will make a substantial contribution to the overall 2020 statewide GHG emission reduction goal of approximately 174 million metric tons of carbon dioxide equivalent gases.[159] (As noted, the term "carbon dioxide-equivalent" is used to account for the differences in global warming potential among the six greenhouse gases.) These measures are summarized as follows:

Group 1: Three new GHG-only regulations were adopted June 21, 2007, to meet the narrow legal definition of "discrete early action GHG reduction measures": a low-carbon fuel standard, reduction of refrigerant losses from motor vehicle

[158] California Air Resources Board, AB 32 Fact Sheet – California Global Warming Solutions Act of 2006, September 25, 2006.

[159] California Air Resources Board, Proposed Early Actions to Mitigate Climate Change in California, April 20, 2007.

air conditioning system maintenance, and increased methane capture from landfills. These regulations are to take effect by January 1, 2010.

Group 2: The ARB is initiating work on 23 other GHG emission-reducing measures in the 2007 to 2009 time period with rulemaking to occur as soon as possible, where applicable. These GHG measures relate to the following sectors: agriculture, commercial, education, energy efficiency, fire suppression, forestry, oil and gas, and transportation.

Group 3: The ARB is initiating work on 10 conventional air pollution controls aimed at criteria and toxic air pollutants, but with concurrent climate co-benefits through reductions in carbon dioxide or non-Kyoto pollutants (i.e., diesel particulate matter, other light-absorbing compounds, and/or ozone precursors) that contribute to global warming.

None of the Group 1 measures specifically relate to construction or operation of new development within the Eastern Neighborhoods study area. Proposed Groups 2 and 3 measures that could become effective during implementation of the proposed rezoning and area plans could pertain to construction-related equipment operations or the design of future development in the Eastern Neighborhoods project area. Some proposed measures will require new legislation to implement, some will require subsidies, some have already been developed, and some will require additional effort to evaluate and quantify. Applicable early action measures that are ultimately adopted from Groups 2 and 3 will become effective during implementation of the Eastern Neighborhoods project, and new development might be subject to these requirements, depending on their timing.

Climate Action Plan for San Francisco

In February 2002, the San Francisco Board of Supervisors passed the Greenhouse Gas Emissions Reduction Resolution, committing the City and County of San Francisco to a GHG emissions reductions goal of 20 percent below 1990 levels by the year 2012. In September 2004, the San Francisco Department of the Environment, the San Francisco Public Utilities Commission published the Climate Action Plan for San Francisco: Local Actions to Reduce Greenhouse Emissions (Plan).[160] Although the Board of Supervisors has not formally committed the City to perform the actions addressed in the Plan, and many of the actions require further development and commitment of resources, it serves as a blueprint for GHG emission reductions, and several actions are now in progress (see discussion in Section IV.B, Plans and Policies, p. 113).

Existing CCSF GHG Reduction Actions. The City is already implementing a wide range of actions related to the reduction of GHG emissions. Some of these actions are described below and additional actions are described in the Climate Action Plan.

[160] San Francisco Department of the Environment and San Francisco Public Utilities Commission, *Climate Action Plan for San Francisco*, Local Actions to Reduce Greenhouse Emissions, September 2004.

- Transportation. The San Francisco Board of Supervisors passed a Resolution No. 728-97 supporting increased Corporate Average Fuel Economy (CAFE) standards in the early 1990s. In 1999, the Board adopted the Healthy Air and Smog Prevention Act, which became Chapter 4 of the City's Environment Code. This ordinance requires that all new purchases or leases of passenger vehicles and light duty trucks must either be rated as ultralow emission vehicle (ULEV) or zero emission vehicles (ZEV) (at least 10 percent were to be ZEV by July 1, 2000). Requirements were also set forth for medium and heavy-duty vehicles and motorized equipment, and for phasing out all highly polluting vehicles and equipment.

- The City has also contributed grant funds towards the development of three alternate fueling facilities. It continues to seek funds to expand alternate fueling infrastructure and has also been successful in developing a number of electric vehicle charging stations both in San Francisco and throughout the Bay Area. In addition, the City encourages car sharing. Several car sharing organizations in the City provide a community-wide solution to vehicle fleets. By providing a network of vehicles in locations around the city, available for reservation on an as-needed basis, residents can utilize small, fuel-efficient and electric vehicles and reduce car ownership. Car sharing is also available for use by businesses and public entities. The City requires the provision of car share parking spaces in large new residential buildings (Planning Code Section 166). The City also limits the amount of parking allowed in new downtown residential developments (Planning Code Section 151.1).

- Solar and Energy Efficiency. San Francisco elected officials and voters have expressed strong support for renewable energy in several ways. The City funds municipal energy efficiency programs through a combination of the SFPUC's Hetch Hetchy Water and Power revenues, state grants and loans, and the City's General Fund at approximately $5.5 million annually. Alternative renewable energy funding mechanisms, which can take advantage of private investor incentives including the 30 percent federal tax credit and accelerated depreciation through acquisition of renewable power from Power Purchase Agreements, are currently being explored. In 2001, the City's Department of Environment received $7.8 million of state funds to manage an energy efficient lighting retrofit program for small businesses in San Francisco. Also in 2001, the voters approved Proposition B and H. Proposition B authorized $100 million in revenue bonds to develop solar, wind and energy efficiency projects in City facilities and Proposition H authorized the City to issue revenue bonds for private sector as well as municipal projects.

- LEED© Silver for Municipal Buildings. In 2004, the City amended Chapter 7 of the Environment Code, requiring all new municipal construction and major renovation projects to achieve Leadership in Energy and Environmental Design (LEED) Silver Certification from the U.S. Green Building Council.

- Zero Waste. In 2004, the City committed to a goal of diverting 75 percent of its waste from landfills by 2010, with the ultimate goal of zero waste by 2020. San Francisco currently recovers 69 percent of discarded material.

- Construction and Demolition Debris Recovery Ordinance. In 2006, the City adopted Ordinance No. 27-06, requiring all construction and demolition debris to be transported to a registered facility that can divert a minimum of 65% of the material from landfills. This ordinance applies to all construction, demolition and remodeling projects within the City.

- The City has also passed ordinances to reduce waste from retail and commercial operations. Ordinance 295-06, the Food Waste Reduction Ordinance, prohibits the use of polystyrene foam disposable food service ware and requires biodegradable/ compostable or recyclable food service ware by restaurants, retail food vendors, City Departments and City contractors. Ordinance 81-07, the Plastic Bag Reduction Ordinance, requires stores located within the City and County of San Francisco to use compostable plastic, recyclable paper and/or reusable checkout bags.

City ordinances include the Green Building Ordinance for City Buildings, and Residential Energy Conservation Ordinance; and City energy policies include those such as set forth in the Energy Policy of the City's *General Plan*, the 1997 Sustainability Plan, and the 2002 Electricity Resource Plan. One of the goals of the Electricity Resource Plan is to maximize energy efficiency in San Francisco. The Plan recommends that the City "periodically review and set annual targets for increasing the efficiency of electricity use and the amount of electricity produced by

renewable sources of energy so that ultimately all of San Francisco's electricity needs are met with zero GHG emissions and minimal impacts on the environment." Increased energy efficiency goals included in the Climate Action Plan include 107 megawatts of electric demand reduction and 759 gigawatt-hours of energy efficiency by 2012.

The Department of the Environment is developing streamlined permitting and public information systems to pave the way for accelerated construction of solar in San Francisco for both hot water heating and electricity. Permit fees are being reduced and requirements standardized. The Department of the Environment is also promoting the integration of solar into the construction of new City facilities through its Green Building program. The SFPUC and the Department of the Environment are cooperating to implement the Generation Solar program to facilitate the installation of solar electric systems on residential and commercial rooftops in San Francisco. SFPUC provides overall oversight of the program, technical assistance, and contractor screening. The Department of the Environment has responsibility for program marketing and proposing changes to building and planning codes, procedures, permitting and fees. Additionally, the Planning Department and Department of Building Inspection have also developed a streamlining process for Solar Photovoltaic (PV) Permits and priority permitting mechanisms for projects pursuing LEED Gold Certification.

Odors

BAAQMD Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds. The limitations of this regulation limit the "discharge of any odorous substance which causes the ambient air at or beyond the property line…to be odorous and to remain odorous after dilution with four parts of odor-free air." The BAAQMD must receive odor complaints from ten or more complainants within a 90-day period in order for the limitations of this regulation to go into effect. If this criterion has been met, an odor violation can be issued by the BAAQMD if a test panel of people can detect an odor in samples collected periodically from the source.

Impact Analysis

Significance Criteria

The proposed project would have a significant air quality impact if it were to:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Conflict with the state goal of reducing GHG emissions in California to 1990 levels by 2020, as set forth by the timetable established in AB 32, California Global Warming Solutions Act of 2006;

- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people; or
- Alter wind, moisture or temperature (including sun shading effects) so as to substantially affect public areas, or change the climate either in the community or region.

Construction emissions associated with the proposed rezoning are fully discussed in the Initial Study (see Appendix A). The Initial Study determined that with implementation of mitigation identified in the Initial Study, air quality impacts related to construction would be less than significant. The Initial Study also determined that wind impacts would be less than significant since proposed rezoning and area plans would not allow for structures tall enough to create such effects. Shadow impacts are evaluated in Section IV.I. Therefore, construction-related air quality, wind, and shadow impacts are not discussed further in this section.

At the present time, there are no rules or regulations in place from the ARB, State Clearinghouse, or other resource agency applicable to the Proposed Project that define what is a "significant" source of greenhouse gas (GHG) emissions, and there are no applicable facility-specific GHG emission limits or caps. The BAAQMD has not yet established thresholds for greenhouse gas emissions. And, as of the time of this writing, no other air districts within California have established emission thresholds for determining the significance of GHGs from industrial projects. Also, while the goal of AB 32 is to reduce in-state GHG emissions to 1990 levels by the year 2020, there is no clear metric that would determine if a single project advances toward or away from this goal. Because global warming is a global issue, a pound of GHGs emitted in California would presumably have the same effect, individually and cumulatively, as a pound of GHGs emitted anywhere else in the world. Whether a single project may or may not result in new GHG emissions would need to consider any change in world-wide GHG emissions that may occur as a result of the project.

Methodology

In general, the proposed project could affect the environment in two related ways. First, the project could result in increases in air pollution through increased generation of air pollutants, such as through increased vehicle travel and demand for energy, and by development of new PDR uses and new transportation facilities that produce site-specific emissions. Second, new development can increase the population in proximity to a pre-existing or new sources of air pollution, increasing exposure and hazard. Both of these impacts are discussed in this section.

The *BAAQMD CEQA Guidelines*, last updated in 1999, distinguish between individual development projects and planning documents, such as city and county general plans, specific

area plans, and redevelopment plans. The BAAQMD states that the "evaluation of a plan's air quality impacts should focus on the analysis of the plan's consistency with the most recently adopted regional air quality plan".[161] In accordance with the *BAAQMD CEQA Guidelines,* this EIR judges the significance of the overall impact of operational emissions of criteria air pollutants generated as a result of the proposed Eastern Neighborhood rezoning and area plans on the basis on the consistency of the proposed project with the *Bay Area 2005 Ozone Strategy*, which is the most recently adopted regional air quality plan. (Individual development projects undertaken in the future pursuant to the new zoning and area plans would be subject to a significance determination based on the BAAQMD's quantitative thresholds for individual projects.)

According to the BAAQMD, a planning document's consistency with the *2005 Ozone Strategy* is established through 1) a comparison of the plan's projections of population and vehicle use (vehicle miles traveled) with those upon which the *2005 Ozone Strategy* is based; 2) the extent to which the plan implements transportation control measures identified in the *2005 Ozone Strategy*; and 3) whether the plan provides buffer zones around sources of odors and toxics.

Localized CO concentrations near congested intersections were analyzed using Caltrans' CALINE4 program. The BAAQMD recommends evaluation of localized carbon monoxide concentrations for projects in which: 1) vehicle emissions of CO would exceed 550 pounds/day; 2) project traffic would impact intersections or roadway links operating at Level of Service (LOS) D, E or F or would cause LOS to decline to D, E or F; or 3) project traffic would increase traffic volumes on nearby roadways by 10 percent or more. However, since most study intersections (more than 80 percent) would operate at LOS D, E, or F under at least one of the scenarios analyzed and total intersection volumes would increase by 10 percent or more at approximately half of these intersections under two of the scenarios, other criteria were applied in this analysis to characterize the magnitude of CO impacts in each of the neighborhoods. Intersections were selected using the following criteria: neighborhood location (at least one intersection per neighborhood was selected), total intersection volume (some intersections had the highest total volumes in the neighborhood), and incremental increase in intersection volume (intersection increases were in the top five for the neighborhood).

Consistency with the *Bay Area 2005 Ozone Strategy*

Consistency with the Regional Air Quality Planning

Consistency of the proposed rezoning and area plans with regional air quality plans can be determined by comparing the project's estimated population growth rates with those used in the most recently adopted regional air quality plan, the *Bay Area 2005 Ozone Strategy*. Since the *2005 Ozone Strategy* growth assumptions for Bay Area communities are based on ABAG's

[161] Bay Area Air Quality Management District (BAAQMD), *BAAQMD CEQA Guidelines – Assessing the Air Quality Impacts of Projects and Plans*, December 1999; p. 51. Available on the internet at: http://www.baaqmd.gov/pln/ceqa/index.htm.

Projections 2003,[162] a comparison of project-related population growth rates with ABAG growth rates for the project area was made to determine consistency of the proposed project with regional air quality plans. As stated in Chapter II, Project Description, project-related population growth rates would exceed ABAG's estimated population growth rates for the project area as they existed at the time the Planning Department developed its Land Use Allocation 2002 growth forecasts. However, inasmuch as the *2005 Ozone Strategy's* assumptions regarding regional travel demand are based on ABAG *Projections 2003*, which forecasts substantially greater growth in developed central cities, including San Francisco, than did earlier versions of the ABAG *Projections* series, the growth forecasts upon which the analyses in this EIR are based would result in lesser increases in both population and employment than assumed in the *2005 Ozone Strategy*. Household population growth in San Francisco as a whole is estimated to increase by less than 10.5 percent between 2000 and 2025, according to the Planning Department's Land Use Allocation 2002. In the Eastern Neighborhoods study area, household population growth is estimated for the same period at between 22 percent and 30 percent, depending on the option.[163] In contrast, the ABAG *Projections 2003* forecasts on which the *2005 Ozone Strategy* is based forecast citywide population growth of more than 14.5 percent, and household population growth within the Eastern Neighborhoods of between about 31 percent and 39 percent.[164] Since growth rates anticipated under the proposed Eastern Neighborhoods Rezoning and Area Plans would not exceed ABAG's projected growth rate for San Francisco or for the Eastern Neighborhoods study area, project implementation under all options would not result in a significant impact on regional air quality planning efforts. Another way of stating this conclusion is that the proposed Eastern Neighborhoods Rezoning and Area Planning Project would generally be consistent with the smart growth principles upon which ABAG's *Projections* have been based since 2003, in that the proposed project would encourage "smart growth"; that is:

> development that revitalizes central cities …, supports and enhances public transit, promotes walking and bicycling, and preserves open spaces and agricultural lands. … Focusing new housing and commercial development within already developed areas requires less public investment in new roads, utilities and amenities. Investment in the urban core can reduce crime, promote affordable housing and create vibrant central cities and small towns. By coordinating job growth with housing growth, and ensuring a good match between income levels and housing prices, smart growth aims to reverse the trend toward longer commutes, particularly to bedroom communities beyond the region's

[162] Telephone communication with Greg Tholen, BAAQMD, Planning and Research, on October 31, 2006. Mr. Tholen indicated that the *Bay Area 2005 Ozone Strategy* replaces the *Clean Air Plan* and is the District's most recently adopted regional air quality plan. This plan uses travel demand growth projections for local communities contained in ABAG's *Projections 2003.*

[163] Under Options A, B, and C, household population growth in the project area is estimated for the same period at approximately 26, 22, and 30 percent, respectively.

[164] Estimated growth for the Eastern Neighborhoods based on *Projections 2003* is derived from TAZ-level forecasts by the San Francisco County Transportation Authority (which estimates 31 percent growth in household population), and from census-tract–level forecasts, also based on *Projections 2003*, by the Association of Bay Area Governments, which estimates household population growth of more than 39 percent.

> boundaries. People who live within easy walking distance of shops, schools, parks and public transit have the option to reduce their driving and therefore pollute less than those living in car-dependent neighborhoods.[165]

A comparison of population growth rates to ABAG growth rates by neighborhood within the study area, as well as citywide, is presented in **Table 49** (see Table 2, p. 33, for complete listing of forecast growth).

The second prong of the BAAQMD's recommended significance evaluation is to compare whether the increase in vehicle miles traveled (VMT) would increase at a rate equal to or lower than the rate of population growth. The number of daily vehicle trips in the study area would increase between 2000 and 2025 by approximately 12, 15, and 20 percent, respectively, under Options A, B, and C. Because the number of daily vehicle trips would increase at a lesser rate than would the population, this suggests that the proposed Eastern Neighborhoods Rezoning and Area Plans project would be consistent with the goal of the *2005 Ozone Strategy* to reduce vehicle usage, relative to population, and thereby reduce VMT. (See also the discussion of transportation control measures, below.)

Moreover, it should be noted that projected growth in the Eastern Neighborhoods would occur in an urban area. Therefore, emissions increases from projected growth and development within the project area could be less than would result if the same amount of growth occurred in outlying areas of the air basin (where trip lengths would be longer, on average). Residential growth in urban areas and near transit corridors would be infill development, enabling the use of transit and alternative transportation modes. The proposed rezoning would also increase proximity of housing to jobs and vice-versa (i.e., "smart growth"), also enabling commutes by transit, walking, and bicycling.[166] It is also expected that as traffic congestion problems worsen in the region and travel times get longer, people will need to shorten their commute distance in order to maintain the same travel time as they have today. These factors, in addition to the project's objective to increase proximity of residential uses to transit corridors, would be expected to help reduce trip lengths in the future.

Consistency with Bay Area 2005 Ozone Strategy Transportation Control Measures (TCMs)

The BAAQMD *CEQA Guidelines* also requires that consistency of a plan be evaluated based on the extent to which it implements TCMs outlined in the *Bay Area 2005 Ozone Strategy.* The

[165] ABAG, "What is smart growth?"; available on the internet at: http://www.abag.ca.gov/planning/smartgrowth/whatisSG.html. Accessed February 13, 2007.

[166] These potential environmental benefits are conditional upon the ability and willingness of San Francisco residents to work in the City, and of San Francisco employees to live in the City. Among the key factors relevant to this future "jobs-housing balance" would be housing prices and wages, as well as the continued desirability of San Francisco as a place to live and future employment potential elsewhere in the Bay Area. Net positive benefits would also be conditioned upon retention of essential local services in the project area, thereby enabling non-auto travel by residents to attain these services.

TABLE 49
COMPARISON OF POPULATION GROWTH RATES

Household Population	Eastern Neighborhoods					Citywide
	East SoMa	Mission	Showplc. Sq./ Potrero Hill	Central Waterfront	Subtotal	
Baseline (2000)	10,211	41,788	13,501	1,704	67,204	756,967
Future No-Project (*Projections 2002* Estimate for 2025)	13,276 (+3,065)	43,906 (+2,118)	14,293 (+792)	2,014 (+310)	73,489 (+6,285)	799,217 (+42,250)
Option A (2025)	14,049 (+3,838)	45,116 (+3,328)	16,911 (+3,410)	8,314 (+6,610)	84,390 (+17,186)	836,490 (+79,523)
Option B (2025)	14,410 (+4,199)	46,089 (+4,301)	17,550 (+4,049)	3,632 (+1,928)	81,681 (+14,477)	834,448 (+77,481)
Option C (2025)	15,388 (+5,177)	48,865 (+7,077)	20,360 (+6,859)	3,079 (+1,375)	87,692 (+20,488)	834,750 (+77,783)
Projections 2003 Estimate for 2025, by census tract (ABAG)[a]	22,127 (+11,916)	46,956 (+5,168)	20,437 (+6,936)	4,184 (+2,480)	93,704 (+26,500)	868,496 (+111,529)
Projections 2003 Estimate for 2025, by TAZ (SFCTA) [b]	16,711 (+6,500)	47,279 (+5,491)	18,992 (+5,491)	4,978 (+3,274)	87,959 (+20,755)	868,496 (+111,529)

[a] ABAG Census Tract projections allocated to each neighborhood by approximating proportion of each tract within that neighborhood.
[b] SFCTA TAZ projections were for 2030 and were reduced to 2025 totals based on percentage by which citywide total exceeded 2025 total in *Projections 2003.*
Notes: ABAG – Association of Bay Area Governments; SFCTA – San Francisco County Transportation Authority; TAZ - Transportation Analysis Zone

SOURCES: San Francisco Planning Department, 2005; ABAG, 2007; SFCTA, 2007

proposed rezoning does not include any specific traffic improvements. Proposed transportation policies of the area plans would be consistent with pertinent TCMs outlined in the *Bay Area 2005 Ozone Strategy*, as discussed below.

Bay Area 2005 Ozone Strategy Transportation Control Measures	Plan Consistency
#3: Improve Local and Areawide Bus Service	Area plans for the Eastern Neighborhoods will include transportation policies that encourage transit improvements to better serve transit corridors where new residential development could occur as a result of proposed rezoning. For example, draft East SoMa Policy 4.1.1: Improve and expand public transit service linking East SoMa to the rest of the city, in addition to downtown, through cross-town and east-west connections, and Policy 4.1.4: Support the proposed E-line Historic streetcar line; draft Mission Policy 4.1.1: The Metropolitan Transit Authority (MTA) should explore improving public transit lines linking the Mission to the rest of the city and Downtown, including cross-town connections, Policy 4.1.2: The MTA should explore improvements to 16th Street as a priority transit corridor, connecting the Mission district, Showplace Square/Lower Potrero, and Mission Bay with accompanying pedestrian and landscaping improvements, and Policy 4.1.3: The MTA should consider east-west transit improvements to better serve the Mission area and improve links to Mission Street transit including BART; draft Showplace Square Policy 3.1.1: Improve and expand public transit

Bay Area 2005 Ozone Strategy Transportation Control Measures	Plan Consistency
	lines linking Showplace to the rest of the city and Downtown, including cross-town connections, Policy 3.1.2: The Municipal Transportation Agency (MTA) should explore improvements to 16th Street as a priority transit corridor, connecting the Mission district, Showplace Square/Lower Potrero, and Mission Bay with accompanying pedestrian and landscaping improvements, and Policy 3.1.3: The MTA should consider north-south transit improvements to better serve the Showplace Square area and mid-SOMA with transit and link them to Market Street, Civic Center, Van Ness and Geary transit corridors; and draft Central Waterfront Policy 3.1: Efficiently and effectively link the residents and workers of the Central Waterfront to Third Street Light Rail.
#5: Improve Access to Rail and Ferries	The proposed rezoning would encourage residential development along bus and rail corridors, including the Third Street light rail corridor (began weekday operation in April 2007).
#9: Improve Bicycle Access and Facilities	Area plans for the Eastern Neighborhoods will include transportation policies that encourage improvement and expansion of neighborhood bicycle routes as well as call for exploring the potential for designation of multi-modal streets, which will include bicycle lanes, transit lanes, and pedestrian improvements. For example, draft East SoMa Policy 4.5.1: Establish East SoMa's linkages with the citywide bicycle network to ensure a comprehensive system of safe, convenient and attractive routes for all travel needs, and Policy 4.5.2: Provide quality bicycle parking, particularly at transit stops, outside stores, and near concentrations of employment.; draft Mission Policy 4.4.1: Improve and expand neighborhood bicycle routes within the Mission, as well as connections with the citywide bicycle network, to ensure a comprehensive system of safe convenient and attractive routes, Policy 4.4.2: Improve the 16th Street corridor within the Mission and its connections to the Castro and Showplace Square, Policy 4.4.3: Explore bicycle improvements on Folsom and Potrero Streets to create a north-south bicycle route to serve the Mission and that connects to SoMa, Policy 4.4.5: Provide quality bicycle parking, particularly at transit stops, outside stores, and near concentrations of employment; draft Showplace Square Policy 3.6.1: Improve and expand neighborhood bicycle routes within the area and connections with the citywide bicycle network to ensure a comprehensive system of safe, convenient and attractive routes, Policy 3.6.2: Improve the 16th/17th Street corridor within the area and its connections to the Mission District and Mission Bay, Policy 3.6.3: The MTA should explore bicycle improvements on Henry Adams or Rhode Island Streets to create a north-south bicycle route to serve the heart of Showplace Square and that connects to 8th Street, and Policy 3.6.4: The MTA should consider improving bicycle connections to Mission Bay and support the Mission Creek Bikeway project; and draft Central Waterfront Policy 4.3: Complete the pieces of the San Francisco bicycle network that are within the Central Waterfront. The primary goal is to create a safe, attractive north-south bicycle route from the Bayview/Hunters Point to downtown San Francisco, Policy 4.4: Complete connections to the bicycle network north and south of the Central Waterfront, and Policy 4.5: Pursue construction of a bicycle and pedestrian bridge over Islais Creek.
#15: Local Land Use Planning and Development Strategies	The proposed rezoning and area plans encourage "smart growth" concepts by increasing proximity of residents to transit and jobs. Area plans will include policies that encourage transit use or alternative transportation modes, promote bicycle use, and ensure pedestrian safety.
#19: Improve Pedestrian Access and Facilities #20: Promote Traffic Calming Measures	Area plans for the Eastern Neighborhoods will include transportation policies that promote calm traffic, bicycle improvements, and pedestrian improvements where neighborhood-oriented streets are planned, where pedestrian corridors are designated, or on streets where pedestrian safety needs to be improved. For example, draft East SoMa Policies 4.7.1 through 4.7.5, regarding consideration of pedestrian improvements on Folsom,

Bay Area 2005 Ozone Strategy Transportation Control Measures	Plan Consistency
	Howard, Second, Third, Fourth, Seventh, and Eighth Streets; draft Mission Policy 4.1.5: As part of the Eastern Neighborhoods Public Benefits Program, consider establishing a fee for residential and commercial developments to fund transit, pedestrian and bicycle improvements in the Mission; draft Showplace Square Policy 3.3.2: Improve streets for pedestrian access and safety, and Policy 3.3.3: Introduce traffic-calming measures and other improvements where appropriate; and draft Central Waterfront Policy 2.3: Ensure provisions for safe and enjoyable pedestrian travel throughout the neighborhood by employing innovative street design.

- ***Compatibility of Project-Related Land Use Changes: Exposure of Sensitive Receptors to Pollutants***

The regional and local air quality impact discussions, demonstrate that future residents of the Eastern Neighborhoods area could be subject to unhealthful levels of particulates (PM_{10} and $PM_{2.5}$). As discussed above, measured levels of particulate matter currently exceed state standards, for both PM_{10} and $PM_{2.5}$. Moreover, recent air pollution studies have shown a consistent association between respiratory and other non-cancer health effects and proximity to high traffic roadways. In addition, there are three carcinogenic toxic air contaminants that constitute the majority of the known health risk from motor vehicle traffic: diesel particulate matter (DPM) from trucks as well as benzene and 1,2-butadiene from passenger vehicles. As noted in the Setting, DPM is the TAC most relevant to the proposed Eastern Neighborhoods Rezoning and Area Plans, both because of pre-existing industrial and commercial uses dependent on heavy duty trucks and because of freeways and designated trucking corridors.

The BAAQMD *CEQA Guidelines* (1999) identify several types of land use conflicts that should be avoided: (1) location of sensitive receptors in proximity to congested intersections, busy roadways; (2) sources of toxic air contaminants; or (3) sources of odorous emissions. Adequate distance, or buffer zone, between the source of emissions and the receptor(s) is necessary to mitigate the problem and the ARB recommends that new sensitive land uses (e.g., residences, schools, daycare centers, playgrounds, or medical facilities) generally not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day. The ARB also recommends various setbacks from distribution centers, rail yards, ports, refineries, chrome platers, dry cleaners using perchloroethylene, and gasoline dispensing facilities. The ARB notes that these recommendations are advisory and should not be interpreted as defined “buffer zones.”

The ARB acknowledges that land use agencies must balance other considerations, including housing and transportation needs, the benefits of urban infill, community economic development priorities, and other quality of life issues. With careful context-specific evaluation, it is the ARB’s position that infill development, mixed-use, higher density, transit-oriented development, and other concepts that benefit regional air quality can be compatible with protecting the health of individuals at the neighborhood level. Context- specific evaluation is a critical element in managing potential land use/air quality conflicts for several reasons. The ARB’s distance-based

recommendations do not consider localized variations in meteorology, such as high dispersion rates in the project area due to the moderately strong onshore flow (sea breeze) common to the San Francisco area. ARB recommendations also do not consider urban canyon effects and the cumulative impacts of multiple adjacent busy roadways on a sensitive receptors.

As noted in the Setting, traffic on freeways and local street is the source of particulate and other emissions that result in adverse health effects, as well as the source of substantial emissions of DPM, which is the primary TAC of concern in the Eastern Neighborhoods. Effects related to potential exposure to these pollutants that could result from implementation of the proposed rezoning and area plans are discussed below.

Roadway Related Health Effects

- *Fine Particulate Matter*

As described in the Setting (and in Appendix C, Public Health Effects Related to Air Quality), epidemiologic studies have demonstrated that people who live near freeways and high-traffic roadways have poorer health outcomes, including increased asthma symptoms and respiratory
- infections and decreased pulmonary function and lung development in children. Health effects, both chronic and acute, may result from exposure to both criteria air pollutants and mobile source air toxics. Health effects of air pollutant exposures may also involve synergistic effects among air pollutants, traffic noise and other traffic-related stressors. The evidence relating proximity to roadways and a range of non-cancer and cancer health effects provides the basis of the ARB's guidance on locating sensitive land use in proximity to such roadways.[167]

In the absence of site specific assessment, it not possible to assess the significance of the health hazard of each specific potential residential site within the proposed Eastern Neighborhoods Rezoning and Area Plans. However, it is likely that, if unmitigated, roadway-related air quality impacts, especially those related to $PM_{2.5}$, at certain locations in the study area would be significant.

These potential significant air-quality impacts due to exposure to roadway pollutants, including $PM_{2.5}$, would be mitigated to a less-than-significant level through implementation of Mitigation
- Measure G-2, p. 511, which would require installation of ventilation and filtration systems where the modeled annual average PM2.5 concentration would exceed 0.2 micrograms per cubic meter,
- which is a level that the San Francisco Department of Public Health identifies as an appropriate trigger level for the roadway contribution of $PM_{2.5}$.

- Although $PM_{2.5}$ is not the only pollutant of concern associated with vehicles or vehicle proximity, for the purpose of Mitigation Measure G-2, $PM_{2.5}$ serves as a proxy for pollutant exposures from roadway vehicles that is amenable to both exposure analysis and the setting of a significance threshold. $PM_{2.5}$ is also a pollutant associated with adverse health outcomes. According to the

[167] California Air Resources Board, *Air Quality and Land Use Handbook* (see footnote 148, p. 333).

Department of Public Health, this threshold, or action level, represents about 8 – 10 percent of the range of ambient $PM_{2.5}$ concentrations in San Francisco based on monitoring data, and is based on epidemiological research that indicates that such a concentration can result in an approximately 0.28 percent increase in non-injury mortality, or an increase of approximately 20 "excess deaths" per year (e.g., deaths that would occur sooner than otherwise expected) per one million population in San Francisco. This effect is above the one-in-a-million lifetime *de minimus* risk threshold for premature death considered insubstantial by most regulatory agencies.[170a]

To determine whether a subsequent residential project would require interior air filtration, an initial screening analysis would be conducted that would evaluate whether a project site is located within 500 feet of the I-80, US 101, and I-280 freeways, or at any other location where total daily traffic volumes from all roadways within 500 feet of such location exceed 100,000 vehicles, based upon the recommendations identified in the ARB *Handbook*, as described above. For those projects that are within the identified proximity to such high traffic roadways, modeling of $PM_{2.5}$ emissions would be used to determine the health risk at the project's location. Accordingly, where the incremental concentration (from roadway sources only) of $PM_{2.5}$ exceeds 0.2 micrograms per cubic meter (annual average) at a particular location, then the placement of residential units at that location would result in a significant impact of a residential project proposed at that location.

Filtration of interior air in residential buildings and other sensitive land uses, as would be required in certain cases under Mitigation Measure G-2, would most likely require changes in construction techniques for many residential buildings. This is because mid-rise most multi-family residential buildings in San Francisco are constructed of poured-in-place, reinforced concrete and are built with ceiling heights of 8 to 9 feet and without space above the ceiling for mechanical equipment. That is, unlike office and other commercial buildings that typically have ventilation system ducts, electrical cable, and plumbing in the "plenum" between a dropped, or false, ceiling and the bottom of the floor above, residential buildings are normally constructed without such plenums because mid-rise residential structures typically do not provide forced-air heating or cooling. Instead, heating is provided by means of wall-mounted units or in-floor radiant heating, and air conditioning is not normally included because of the City's mild climate. (Plumbing and electrical cables are run within walls in residential structures.)

If interior air were to be filtered, this would either necessitate the installation of a central forced air ventilation system, more like an office building, with either greater floor-to-floor heights to provide space for duct work or the use of vertical duct plenum space between the walls of the building. Heating (and possibly air conditioning) might be part of the forced-air system, or could

[170a] Rajiv Bhatia, MD, MPH, Director, Occupational and Environmental Health, San Francisco Department of Public Health, comment letter on Draft EIR, July 2007 (see Chapter VIII), *citing* Jerrett, Michael, *et. al.*, "Spatial Analysis of Air Pollution and Mortality in Los Angeles," *Epidemiology* 16:6, November 2005, p. 727. Twenty excess deaths per million based on non-injury, non-homicide, non-suicide mortality rate of approximately 714 per 100,000, from California Department of Health Services vital statistics records.

remain separate. Alternatively, it might be possible to install exterior-wall-mounted ventilation systems in individual residential units, along the lines of what hotels sometimes employ. (Residential buildings typically must provide for greater individual temperature and ventilation control in each unit than office buildings, in which a larger office suite or an entire floor may be controlled by a small number of thermostats.)

The above-noted design considerations are likely to result in some increase in the cost of residential construction where modeling indicates that air filtration is necessary to provide for

- acceptable indoor air quality, relative to outdoor concentrations of fine particulate matter
- ($PM_{2.5}$), as well as diesel particulate matter (DPM; see below) and other motor vehicle pollutants. Additional costs would be incurred in basic construction and in the cost of air-handling equipment, as well as the operation of such equipment over time. This operation would also increase the energy use of a particular building, with concomitant increases in greenhouse gas emissions due to energy production, and if air conditional were installed as part of the filtration system, the increased energy use could not be dramatic. (As noted, air conditioning is not
- commonly installed in San Francisco residential structures.) Additional costs for ventilation may be lessened substantially where such systems are necessary to achieve compliance with Title 24 interior noise standards. Finally, to the extent that filtered ventilation were to result in greater floor-to-floor heights in residential construction, the effective density of a given project could be reduced. For example, whereas a 50-foot height limit would allow up to a five-story residential building with 10-foot floor-to-floor heights, only four stories could be built if floor-to-floor
- heights were increased by 18 inches to allow for ventilation duct work to be installed; in contrast, vertical plenums would not necessarily alter the number of stories but would reduce the available interior floor area.

- In addition to filtration of $PM_{2.5}$, odors, when detectable, can be a nuisance to future residents. Since the proposed rezoning and area plans would increase the number of residents located in proximity to existing odor emission sources (generally associated with existing industrial uses), there could be an increased potential for future land use conflicts. Provision of upgraded ventilation systems that would allow residents to close windows and ventilate/filter air mechanically (Mitigation Measure G-2) would reduce the severity of these less-than-significant potential nuisance impacts.

Diesel Particulate Matter and Other TAC Exposure and Health Effects

As noted in the Setting, diesel particulate matter (DPM) is a toxic air contaminant and the ARB recommends that proximity to sources of DPM emissions be considered in the siting of new development. Among other things, ARB advises that new sensitive land uses (e.g., residences, schools, daycare centers, playgrounds, or medical facilities) not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day, or within 1,000 feet of a distribution center (warehouse) that accommodates more than 100 trucks or more than 40 refrigerator trucks per day.

As discussed in the Setting, the ARB's Diesel Risk Reduction Plan is intended to substantially reduce DPM emissions and the associated health risk through introduction of ultra-low-sulfur diesel fuel – a step already implemented – and cleaner-burning diesel engines. The technology for reducing DPM emissions from heavy duty trucks is well-established, and both state and federal regulators are moving aggressively to require modifications in engines and emission control systems to reduce and clean up diesel emissions. ARB anticipates that, by 2020, average statewide DPM concentrations will decrease by 85 percent from levels in 2000 with full implementation of the Diesel Risk Reduction Plan, meaning that the statewide health risk from DPM would have decreased from 540 cancer cases in one million to 245 in one million. It is likely that the Bay Area cancer risk from DPM will decrease by a similar factor by 2020.

In connection with the Rincon Hill Plan EIR (Case No. 2000.1081E; Final EIR certified May 5, 2005), modeling of DPM concentration and cancer health risk was undertaken for locations adjacent to the I-80 freeway immediately east of the East SoMa area within the Eastern Neighborhoods study area. That modeling effort, which was specific to diesel exhaust, identified a maximum lifetime cancer risk due to immediate proximity to the freeway (within about 65 feet, which was approximately the location of the nearest anticipated residential receptor within the Rincon Hill Plan area) of 27 in one million, based on 2006 emissions levels. This risk was nearly three times the typical standard of 10 in one million used in CEQA-related health risk analyses to identify a significant impact. However, the analysis in the Rincon Hill Plan Final EIR noted that the 27-in-one-million risk was artificially high, in that it can be reasonably be anticipated that diesel emission levels will decline considerably even within the first few years of the 70-year lifetime that is the standard assumption in health risk assessment. For example, the same risk calculation performed using 2020 emission rates revealed a lifetime cancer risk of 9 in one million, which is below the typical significance threshold. Finally, the risk reported in the Rincon Hill Plan FEIR was for an assumed downwind receptor. Because no receptor is downwind all the time, the results reported were conservatively high. Because the Rincon Hill Plan area is generally upwind of the I-80 freeway, that Final EIR concluded that "residential development within the Plan area would not be likely to result in a significant adverse health impact to Plan area residents, and therefore no significant effect would result."[168]

While the proposed Eastern Neighborhoods Rezoning and Area Plans project would result in new areas of housing both upwind and downwind of local freeways, no location would ever experience the maximum risk noted above, because of the variability of wind direction. Moreover, any associated health risk posed by exposure to DPM would diminish over time (as DPM emissions decrease) and exposure over the near term—pending DPM emissions reductions—could be reduced to a less-than-significant level by providing upgraded ventilation

[168] The Rincon Hill Plan FEIR also noted that other factors would likely reduce residential health risk, including the filtration effects of heating and ventilation systems, which typically results in lowered particulate concentrations indoors, where people tend to spend most of their time, as well as the elevation above grade of local freeways, which would tend to result in dispersion (both below and above the roadway) of pollutants, further reducing nearby pollutant concentrations.

systems in residential units and avoiding locating other sensitive uses (e.g., schools, playgrounds, day care facilities, medical facilities) within 500 feet of this freeway (see Mitigation Measure G-2, p. 511).

Certain other uses that could locate in the project area could result in emissions of DPM and other TACs. These include, for DPM, warehousing and distribution centers and commercial, industrial, or other uses that generate substantial truck traffic. For other TACs, uses would include, among others, dry cleaners, drive-through restaurants, gas stations, auto body shops, metal plating shops; photo processing, furniture upholstery, appliance repair, printing, hospitals and clinics, biotechnology research, warehousing and distribution centers, and processing of textiles and leather.

Implementation of Mitigation Measure G-3, Siting of Uses that Emit DPM, p. 512, would require that such uses be located no less than 1,000 feet from residential units and other sensitive receptors, including schools, children's day care centers, parks and playgrounds, hospitals, nursing and convalescent homes, and like uses. Mitigation Measure G-4, Siting of Uses that Emit Other TACs, p. 512, would require preparation of an analysis that includes, at a minimum, a site survey to identify residential or other sensitive uses within 1,000 feet of the project site, prior to the first project approval action. Implementation of these two measures would reduce impacts of uses generating DPM and other TACs to a less-than-significant level.

The risk from DPM will decrease over time as cleaner technologies are phased into use. The ARB's Diesel Risk Reduction Plan aims to develop and implement specific statewide regulations to reduce DPM emissions and the associated health risk by 75 percent by 2010 and 85 percent by 2020. Nevertheless, until there is sufficient fleet turnover and retrofitting of older trucks to reduce DPM emissions, sensitive land uses would be subject to cancer-related health risks associated with proximity to freeways and major roadways with large volumes of truck traffic within the Eastern Neighborhoods. While potentially a significant impact of the proposed rezoning, given future trends of declining DPM emissions and other vehicle emissions, length of time that projected growth in the Eastern Neighborhoods would occur (2025), local meteorological conditions, and overall land use objectives to encourage infill and transit-oriented development (which would improve regional air quality), DPM-related health risks to residents and employees of new development in the Eastern Neighborhoods could be minimized by provision of upgraded ventilation systems where modeling of DPM concentrations indicates such filtration is warranted. Along with regulations already in place to reduce DPM emissions, such interior air filtration, where warranted, would be expected to reduce the impact to a less-than-significant level (see Mitigation Measure G-2, p. 511).

- Implementation of Mitigation Measure G-2 would reduce lifetime cancer risk from DPM to less than 10 in one million, the commonly accepted standard is health risk analysis.[169] This is because an annual average concentration of 0.2 micrograms per cubic meter is of $PM_{2.5}$ is approximately translatable to a cancer risk of 10 in one million (which would result from a DPM concentration of approximately 0.03 micrograms per cubic meter of DPM, using the state's "unit risk value" of 3×10^{-4}), assuming DPM constitutes approximately 15 percent of mobile-source $PM_{2.5}$, based on reported values.[170] Moreover, San Francisco highways carry a relatively lower percentage of diesel truck traffic than many other urban roadways. Finally, as noted in the Setting, the ARB aims to reduce DPM emissions and the associated health risk by 75 percent by 2010 and 85 percent by 2020. Thus, implementation of Mitigation Measure G-2 would reduce the impact of DPM exposure to a less-than-significant level. (It is noted that the roadway-only risk would exclude the existing Bay Area-wide cancer risk from DPM of about 480 in one million, as of 2000, as reported in the Setting.)

Neighborhood Analysis

This section discusses potential local effects related to DPM and other air quality-realted health effects in each neighborhood:

East SoMa. This neighborhood is traversed by the I-80 freeway and the proposed rezoning would allow residential uses within 500 feet of this freeway, primarily between Third Street and The Embarcadero on both sides of the freeway under Option A. Under Options B and C, the area with residential zoning would be larger, extending one block to the southwest, between Fourth Street and The Embarcadero (on both sides of this freeway). Many East SoMa streets also have high volumes of heavy trucks. Future residents within these areas could be subject to elevated levels of

[169] As stated in the Setting, the National Cancer Institute reports that the lifetime probability of being diagnosed with cancer in the United States, from all causes, is more than 40 percent, or greater than 400,000 in one million.

[170] Hodan, William M. and William R. Barnard, *Evaluating the Contribution of PM2.5 Precursor Gases and Re-entrained Road Emissions to Mobile Source PM2.5 Particulate Matter Emissions*, Prepared by MACTEC Under Contract to the Federal Highway Administration, Available on the internet at: http://www.epa.gov/ttn/chief/conference/ei13/mobile/hodan.pdf.

DPM in the near term, as well as fine particulates, and this would be a potentially significant impact, although, as discussed above, the contribution of freeway traffic and urban truck routes is difficult to classify precisely, and can vary from location to location. However, such health risks as would be posed by exposure to DPM would diminish greatly over time (as DPM emissions decrease) and exposure over the short term could be reduced to a less-than-significant level by providing, where indicated on the basis of modeling of pollutant concentrations, upgraded ventilation systems in residential units and avoiding locating other sensitive uses (e.g., schools, playgrounds, day care facilities, medical facilities) within 500 feet of this freeway (see Mitigation Measure G-2).

Mission. There are no freeways that extend through the Mission District. The U.S. 101 freeway is to the north and east of this neighborhood so that only a small portion of the easternmost margin of this neighborhood would be located within 500 feet of this freeway. The proposed rezoning (under all options and People's Plan and MCEJJ variants) would not result in any change in residential uses within this affected area. Based upon review of Department of Parking and Traffic data on San Francisco traffic volumes, new residential development within this neighborhood that could occur as a result of the proposed rezoning (under all options) would occur on streets carrying volumes of less than 25,000 vehicles per day, and therefore, potential health risks due to proximity to freeways and other high-volume roadways would likely be less than significant. Where applicable due to site-specific modeling results, implementation of Mitigation Measure G-2 would reduce any potentially significant effects of residential or other sensitive-receptor development to a less-than-significant level.

Showplace Square/Potrero Hill. The western portion of this neighborhood is traversed by the US 101 freeway, while the I-280 freeway is located along the eastern margin of this neighborhood. The proposed rezoning would allow new residential uses to occur in areas within 500 feet of both sides of the U.S. 101 freeway, generally north of Mariposa Street under all options. There is also a small area within the southeast corner of this neighborhood where new residential uses could occur within 500 feet of the I-280 freeway. Future residents within these areas could be subject to elevated levels of DPM in the near term, as well as fine particulates, and this would be a potentially significant impact, although, as discussed above, the contribution of freeway traffic is difficult to classify precisely, and can vary from location to location. However, such health risks as would be posed by exposure to DPM would diminish greatly over time (as DPM emissions decrease) and exposure over the short term could be reduced to a less-than-significant level by providing, where indicated on the basis of modeling of pollutant concentrations, upgraded ventilation systems in residential units and avoiding locating other sensitive uses (e.g., schools, playgrounds, day care facilities, medical facilities) within 500 feet of this freeway (see Mitigation Measure G-2).

Central Waterfront. The western portion of this neighborhood is traversed by the I-280 freeway. In addition, there are two industrial facilities in the eastern margin of this neighborhood (see

Table 47, p. 328): Mirant Potrero Power Plant and San Francisco Drydock. (As noted in the setting, a third facility, the PG&E Hunters Point power plant, has been closed.) These facilities are the primary fugitive and point emission sources for TACs in San Francisco County. The proposed rezoning would encourage extension of the Dogpatch residential neighborhood, including the Third Street corridor, where the Third Street Light Rail line is to begin full operation in 2007. Such expansion of residential uses under all options would increase the number of residents that could be exposed to TACs. Future residents would be located upwind of this one emission source and would not appear to be exposed to high levels of TACs from this source.

Under Option A, it is assumed that the Mirant Potrero Power Plant would cease operations at some future date and the power plant site could be redeveloped with 2,500 residential units. Such redevelopment would increase proximity of residential uses to the San Francisco Drydock to the north and its associated fugitive TAC air emissions. Since the BAAQMD *CEQA Guidelines* recommend locating sensitive uses away from sources of TACs, this potential residential development would not be consistent with these guidelines.

A review of BAAQMD odor complaint records for the past five years (2001 through 2006) for the San Francisco Drydock Inc. and Mirant Potrero Power Plant facilities revealed that no complaints were received. Therefore, project-related increases in the number of residents in proximity to these facilities increase is not expected to significantly increase the potential for land use conflicts associated with nuisance odors.

The proposed rezoning would not encourage new residential uses within 500 feet of the I-280 freeway. This would minimize the potential for exposing new sensitive land uses to DPM emissions and fine particulates along this freeway. Where applicable due to site-specific modeling results, implementation of Mitigation Measure G-2 would reduce any potentially significant effects of residential or other sensitive-receptor development to a less-than-significant level.

With implementation of Mitigation Measures G-2, G-3, and G-4, the project would be consistent with the *Bay Area 2005 Ozone Strategy,* and therefore project air quality impacts would be less than significant.

Carbon Monoxide

A detailed CO impact analysis was conducted at eight study intersections distributed throughout the project area. These eight intersections were representative of the maximum CO impacts that could occur at any intersection within the project area. Intersection levels of service (used as an indicator of travel speed) were calculated as part of the transportation analysis. The eight intersections were selected based on neighborhood location (at least one intersection per neighborhood was selected), total intersection volume (some intersections had the highest total

volumes in the neighborhood), and incremental increase in intersection volume (intersection increases were in the top five for the neighborhood). By selecting this range of intersections, it is expected that other 32 study intersections in the project area would have future CO concentrations that are the same or less than the selected intersections. A Caltrans screening approach, which is based on the CALINE4 model, was used to estimate CO concentrations along these roadway links. CO concentrations were calculated at a distance of 25 feet from the edge of each roadway to determine potential impacts based on worst-case conditions (peak hour traffic and theoretical minimum atmospheric mixing).

Significance of localized CO emissions from mobile sources are determined by modeling the ambient CO concentration under future (2025) conditions, and comparing the resulting one-hour and eight-hour concentrations (both without and with the proposed rezoning under Options A, B, and C) to the respective state and federal CO standards, and this comparison is presented in **Table 50**. A detailed impact analysis using the BAAQMD screening model indicates that the state and federal one-hour and eight-hour standards for CO would not be violated at study intersections during worst-case atmospheric conditions (wintertime conditions when CO concentrations are typically greatest). Modeling results indicate that CO concentrations will decrease in the future due to attrition of older, high polluting vehicles, improvements in the overall automobile fleet, and improved fuel mixtures (as a result of on-going state and federal emissions standards and programs for on-road motor vehicles). Therefore, the proposed rezoning would have a less-than-significant impact on local air quality.

Greenhouse Gas Emissions

Implementation of any of the proposed rezoning options would contribute to long-term increases in greenhouse gases (GHGs) as a result of traffic increases (mobile sources) and residential and commercial building heating (area sources), as well as indirectly, through electricity generation. To provide an order-of-magnitude estimate of the GHG emissions that could be generated as a result of development secondary to implementation of the proposed rezoning and area plans, GHG emissions for on-road transportation, domestic and commercial heating, and energy generation were calculated using the California Climate Action Registry (CCAR) Protocol document, emissions factors developed by ARB, the BAAQMD's inventory of GHG emissions , and the California Energy Commission's estimates of statewide GHG emissions, and results are presented in **Table 51**. These sources would represent the great majority of GHGs that would be produced in association with the project area, because the project area contains little in the way of manufacturing and other heavy industry, and virtually no agricultural or energy-related activities, and thus would generate little in the way of GHGs other than carbon dioxide. Even in the Bay

TABLE 50
ESTIMATED WORST-CASE BASELINE AND FUTURE CO CONCENTRATIONS AT SELECTED INTERSECTIONS (IN PPM)

Neighborhood and Intersections	Averaging Period	Baseline (2000)	Future No-Proj. (2025)	Future (2025) + Option A	Future (2025) + Option B	Future (2025) + Option C
East SoMa						
Third St./King St.	1 Hour	5.8	5.3	5.4	5.4	5.4
	8 Hour	4.2	3.8	3.9	3.9	3.9
Seventh St./US 101 Westbound On-ramp-Harrison St.	1 Hour	5.3	4.8	4.9	5.0	4.9
	8 Hour	3.8	3.5	3.6	3.6	3.5
Mission						
S. Van Ness-Howard St./Division St.	1 Hour	5.9	5.1	5.2	5.3	5.3
	8 Hour	4.2	3.7	3.8	3.8	3.8
24th St./Mission St.	1 Hour	4.4	3.9	4.0	4.0	4.0
	8 Hour	3.2	2.9	2.9	2.9	2.9
Showplace Square/Potrero Hill						
Potrero St./16th St.	1 Hour	4.9	4.6	4.6	4.6	4.6
	8 Hour	3.5	3.3	3.3	3.4	3.4
Seventh St./Townsend St.	1 Hour	4.9	4.2	4.2	4.3	4.5
	8 Hour	3.6	3.1	3.1	3.2	3.3
Central Waterfront						
Evans St./César Chávez St.	1 Hour	5.3	4.5	5.1	5.1	5.1
	8 Hour	3.9	3.3	3.7	3.7	3.7
Third St./25th St.	1 Hour	5.0	3.5	4.7	3.9	4.7
	8 Hour	3.6	2.6	3.4	2.6	3.4
State CO Standard	1 Hour	20 ppm	20 ppm	20 ppm	20 ppm	20 ppm
	8 Hour	9 ppm	9 ppm	9 ppm	9 ppm	9 ppm
Federal CO Standard	1 Hour	35 ppm	35 ppm	35 ppm	35 ppm	35 ppm
	8 Hour	9 ppm	9 ppm	9 ppm	9 ppm	9 ppm

NOTES: CO levels include background CO levels of 3.7 ppm (Baseline) and 2.7 ppm (Future) for 1 Hour and 3.4 ppm (Baseline) and 2.5 ppm (Future) for 8 Hour. The "Baseline" and "Future" scenarios are based on baseline (2000) and future (2025) traffic volumes presented in the Traffic section of this report.

SOURCE: Orion Environmental Associates, 2007.

Area as a whole, carbon dioxide makes up 90 percent of GHG emissions, measured in terms of carbon dioxide equivalency, while methane (CH4) and nitrous oxide (N2O) emissions represent 4.5 and 5 percent, respectively, of GHG emissions.[171]

On-road transportation sources (i.e., automobiles, trucks, and buses), would represent the largest source of GHG emissions –about 37 to 38 percent of all GHG emissions from the project area, depending on the rezoning option, would be generated by vehicle travel. This is consistent with existing Bay Area and statewide patterns of GHG emissions, as described in the Setting, above. Electricity generation (both from in-state and out-of-state power plants) would be the second

[171] BAAQMD, *Source Inventory of Bay Area Greenhouse Gas Emissions* (see Note 144, p. 330); page 6.

TABLE 51
ESTIMATED GREENHOUSE GAS EMISSIONS (IN CO_2-EQUIVALENT TONS PER YEAR)

Source	Baseline (2000)	No Project (2025)	Option A (2025)	Option B (2025)	Option C (2025)
On-Road Transportation	355,600	332,700	350,900	358,800	374,200
Electricity Generation	199,900	218,600	251,000	243,000	260,800
Solid Waste	144,900	158,500	182,000	176,100	189,100
Space Heating (natural gas)	143,800	157,300	174,000	167,700	173,300
Total	844,200	867,100	957,900	945,600	997,400
Percent of Bay Area (2002)	1.0%	1.0%	1.1%	1.1%	1.2%
Change from Baseline (pct.)	N/A	1.4%	13.5%	12.0%	18.2%
Change from No Project (pct.)	N/A	N/A	10.5%	9.1%	15.0%
Tons per person per year	11.3	11.6	11.4	11.8	12.6

On-Road Transportation emissions based on daily vehicle trips from transportation analysis and average trip length from BAAQMD CEQA Guidelines (6.5 miles in 2000, and 5.9 miles in 2025). Electricity generation emissions based on statewide average of 3.0 tons/person/year, derived California Energy Commission calculations of statewide GHG emissions. Solid Waste emissions based on Bay Area average of 2.2 tons per person per year. Space heating emissions based on Planning Department growth projections and URBEMIS emissions model natural gas usage factors.

Source: Environmental Science Associates, 2007.

largest source of GHG emissions under each of the rezoning options (although, as noted, some of this would occur outside the Bay Area.

The project's incremental increases in GHG emissions associated with traffic increases, residential and commercial space heating, and increased energy demand would contribute to regional and global increases in GHG emissions and associated climate change effects. Neither the BAAQMD nor any other agency has adopted significance criteria or methodologies for estimating a project's contribution of GHGs or evaluating its significance. However, the proposed rezoning would encourage use of transit and alternative transportation modes, which could help reduce transportation-related GHG emissions, relative to the same amount of population and employment growth elsewhere in the Bay Area, where transit service is generally less available than in the central city of San Francisco. In addition, GHG emissions increases from projected growth and development within the project area could be less than would result if this growth occurred in outlying areas of the air basin, where trip lengths would be longer. Moreover, the project's emphasis on creating relatively higher-density, mixed-use neighborhoods would be expected to make walking and other non-vehicular travel more viable than would be the case for similar population and employment growth in lower-density, single use neighborhood. New construction within the project area will also be required to meet California Energy Efficiency Standards for Residential and Nonresidential Buildings, requirements of pertinent City ordinances such as the Residential Energy Conservation Ordinance, and emissions reduction actions included in the San Francisco Climate Action Plan, helping to reduce future energy demand as well as reduce the project's contribution to regional GHG emissions.

Thus, it can be fairly stated that GHG emissions related to the proposed Eastern Neighborhoods Rezoning and Area Plans would likely be of lesser intensity than for residential and commercial development of comparable magnitude in a less dense, more sprawling environment. It can be stated with equal clarity that enhancements to transit service in the project area and vicinity, provision of other alternatives to automobile travel, and measures to permit employees to live closer to their workplaces and to provide employment opportunities for nearby residents would all combine to reduce GHG emissions that would otherwise be generated by increased vehicle travel. Given all these factors to minimize vehicle trip lengths and energy demand increases, the proposed rezoning options would not conflict with the State's goals of reducing GHG emissions to 1990 levels by 2020, and the project's impact on GHG emissions would be less than significant.