Appendix D CHS Consulting, Fehr & Peers, LCW Consulting Candlestick Point–Hunters Point Shipyard Phase II Development Plan Transportation Study, November 4, 2009

Candlestick Point – Hunters Point Shipyard Phase II Development Plan Transportation Study

SFRA File No. ER06.05.07
Planning Dept Case No. 2007.0946E

Final Report

Prepared for:
City and County of San Francisco
Planning Department

Prepared by:
CHS Consulting Group
Fehr & Peers
LCW Consulting

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Chapter 1
INTRODUCTION

This report documents the process and findings of the transportation analysis conducted for the Candlestick Point–Hunters Point Shipyard Phase II (CP-HPS Phase II) Development Plan (herein referred to as the "Project") in the City and County of San Francisco. The report includes a description of the Project, Project Variants and Alternatives to the Project, describes existing traffic, transit, pedestrian, bicycle and parking conditions in the study area, presents future year 2030 cumulative conditions without and with the Project and alternatives, and presents a transportation impact analysis of the various scenarios.

The following transportation elements are addressed in this study:

- Traffic impacts
- Transit impacts
- Parking impacts
- Pedestrian impacts
- Bicycle impacts
- Loading impacts
- Emergency vehicle access impacts
- Construction impacts

1.1 PROJECT OVERVIEW AND LOCATION

The CP-HPS Phase II Development Plan encompasses an approximately 702-acre area east of U.S. 101 in the southeast area of the City and occupies the waterfront area from south of India Basin to Candlestick Cove. The Project location is shown on **Figure 1.**

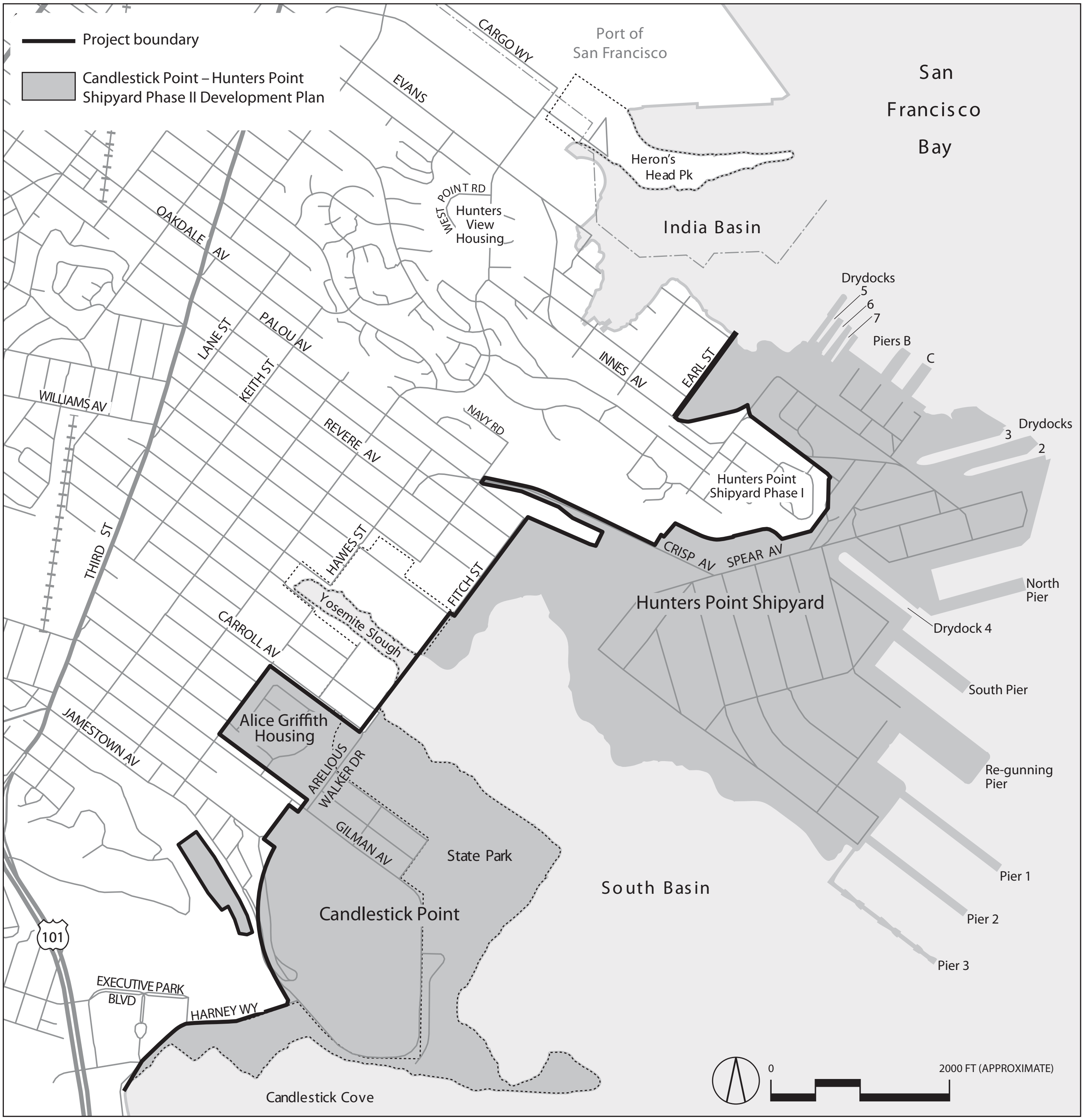
Candlestick Point and Hunters Point Shipyard comprise the southeasternmost portion of San Francisco; taken together, they are bordered by Heron's Head Park on the north, the San Mateo County line on the south, Bayview Hill, Yosemite Slough, and Hunters Point Hill on the west, and San Francisco Bay on the east. The Development Plan would comprise approximately 702 acres, with 281 in Candlestick Point and 421 in Hunters Point Shipyard Phase II. **Figure 2** presents the boundaries of the Project.

1.2 SCOPE OF ANALYSIS

The transportation study was conducted based on the scope of work developed by the Planning Department, which is included in Transportation Study Appendix A.

SOURCE: Fehr & Peers; AECOM

FIGURE 1: PROJECT LOCATION



SOURCE: San Francisco Redevelopment Agency, Lennar, 2008.

FIGURE 2: PROJECT SITE AND CONTEXT

The transportation study presents an assessment of the existing conditions within the defined transportation study area, as well as an assessment of future year 2030 conditions without and with the Project. Project impacts were determined by comparing the future year 2030 conditions with the Project, to those without the Project (i.e., 2030 No Project conditions).

Since the stadium is a special trip generator where football games do not affect typical weekday commute period traffic, Sunday conditions were also included for assessment of football game impacts[1].

1.3 REPORT ORGANIZATION

The remainder of the report is divided into six chapters that present the Project, the transportation analysis methodology, and the existing and future conditions.

- Chapter 2 presents the description of the Project, Project Variants and Alternatives to the Project.
- Chapter 3 presents the existing transportation network and operating conditions.
- Chapter 4 presents the analysis methods and assumption used in determining future travel demand and criteria for impact assessment.
- Chapter 5 presents the future baseline (No Project) conditions for year 2030.
- Chapter 6 presents the impact analysis for the Project, Project Variants and Alternatives to the Project.
- Chapter 7 summarizes the impacts and proposed mitigation measures.

The Transportation Study Appendix, included in the attached compact disc, includes additional transportation system descriptions, and analysis calculations. It also includes the May 2009 Fehr and Peers memorandum documenting the 4D Travel Demand Methodology used in Project trip generation, mode split and trip distribution, as well as the memoranda documenting the Muni operating plan for the Project.

[1] In rare circumstances, football games are played on Monday or Thursday nights; however, since this typically occurs no more than twice per season at most, the analysis of the football stadium impacts was conducted for more typical Sunday afternoon conditions.

Chapter 2
PROJECT DESCRIPTION

This chapter briefly presents the existing setting within Candlestick Point and Hunters Point Shipyard, and presents the land use program by area and the proposed transportation network improvements. This chapter summarizes the Transportation Plan as part of the CP-HPS Phase II Development Plan. Project Variants and Alternatives to the Project analyzed in this transportation study are also presented. A detailed Project description is included in Transportation Study Appendix B.

2.1 PROJECT SETTING

The Candlestick Point area is approximately 267 acres including the Alice Griffith Public Housing development. Current land uses in the Candlestick Point area include Candlestick Park stadium owned by the City and County, and used by the San Francisco 49ers National Football League team, and associated parking lots and access roadways. The stadium and parking lot areas are under the jurisdiction of the San Francisco Recreation and Park Department. The area includes several privately owned parcels near Gilman Avenue and Arelious Walker Drive, north of the stadium. That area is primarily vacant and used for stadium parking. A recreational vehicle park occupies a portion of the site on Gilman Avenue. The Candlestick Point area also includes the Alice Griffith public housing site, which is bounded by Gilman Avenue on its southwest, Hawes Street on the northwest, Carroll Avenue on the northeast and Arelious Walker Drive on the southeast (see **Figure 2**).

The existing Candlestick Park stadium typically hosts up to 12 games per year, including eight regular season games, two pre-season games, and for teams that qualify for playoffs, two post-season games. Professional football games on the west coast are typically scheduled for 1:00 p.m. on Sundays, from September through early December. The post-season runs into January and games can be played on either Saturday or Sunday. At the conclusion of the college football season in late November, a few NFL games are played on Saturdays, as are some pre-season games. Successful teams typically play at least one Monday night (6:00 p.m.) game, and the 49ers have had at least one such home game in each of the past several seasons. Occasionally (no more than once per year), Sunday games are held at 5:00 p.m.

HPS Phase II comprises 421 acres (dry-land) and includes many structures associated with ship repair, piers, dry-docks, ancillary storage, administrative, and other former U.S. Navy uses largely from the World War II era. Several former Navy buildings are currently leased and occupied as artist studios. The HPS Phase II area primarily consists of Navy Parcels B, C, D and E. The entire HPS Phase II development area is currently under the jurisdiction of the U.S. Navy.

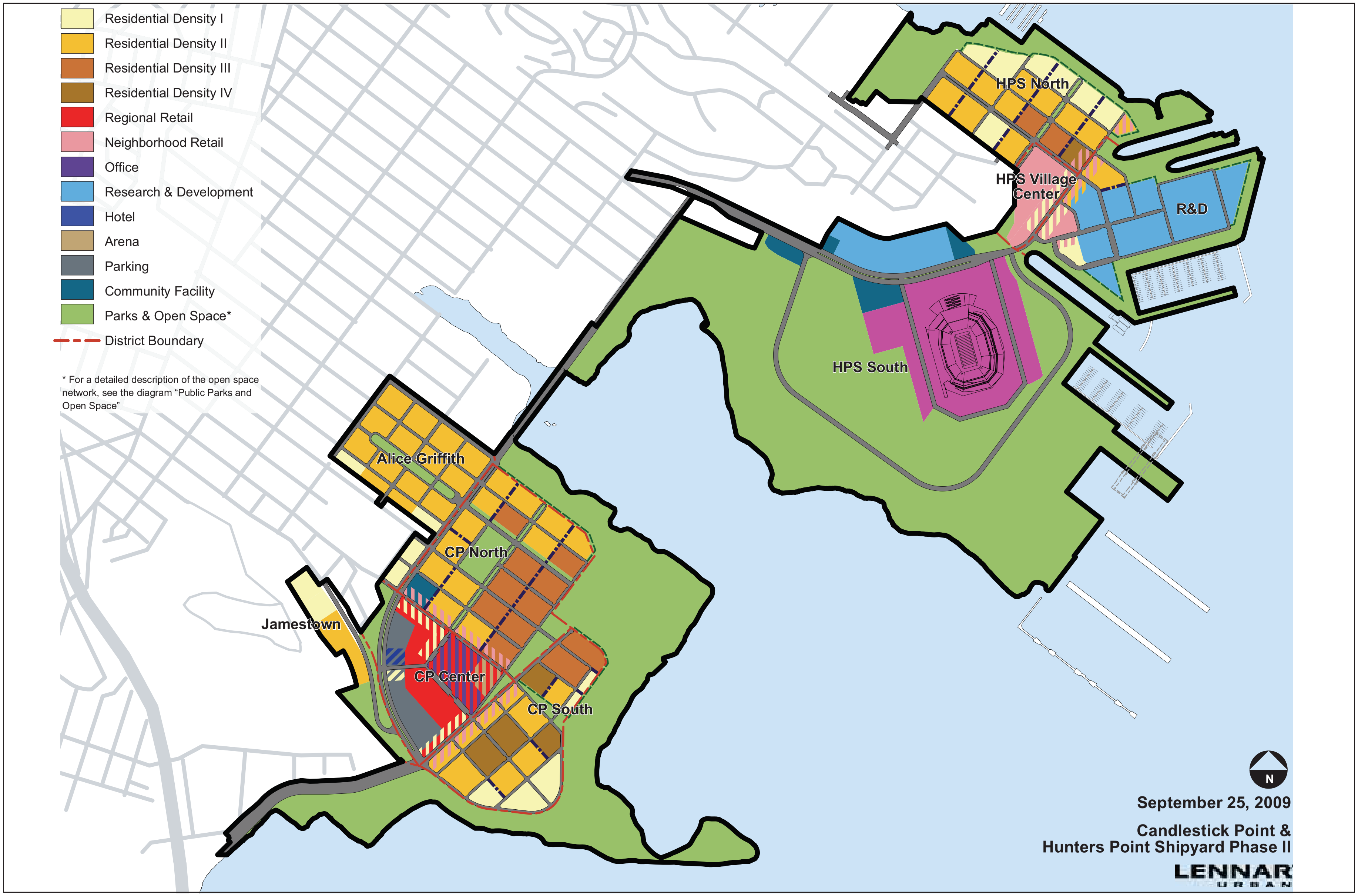
2.2 PROJECT LAND USE PROGRAM

The CP-HPS Phase II Development Plan is a development being proposed by Lennar Urban, and is being analyzed at a project level of detail in the Project EIR. A wide range of uses are proposed, for a mixed-use community with residential, retail, office, research and development, civic and community uses, and parks and recreational open space. A major component would be a new stadium for the San Francisco 49ers, a National Football League team. The development program also includes a 10,000-seat arena. New infrastructure would be constructed to serve the development. **Figure 3** presents the proposed land use plan for Candlestick Point and Hunters Point Shipyard. As noted above, a detailed Project description is provided in Transportation Study Appendix B. **Table 1** summarizes the land use program that was assumed for Project analysis.

Table 1
Project Land Use Program Summary

	Proposed Project
Hunters Point Shipyard	
Residential (units)	2,650
Neighborhood Retail (gsf)	125,000
Research & Development (gsf)	2,500,000
Artists Studios (gsf) [1]	255,000
Community Services (gsf)	50,000
Park (acres)	231
Stadium (seats)	69,000
Marina (slips)	300
Candlestick Point	
Residential (units) [2]	7,850
Neighborhood Retail (gsf)	125,000
Regional Retail (gsf)	635,000
Office (gsf)	150,000
Hotel (rooms)	220
Community Services (gsf)	50,000
Park (acres)	105
Arena (seats)	10,000

Notes:
1. Project includes 225,000 sf of existing artist studio space that would be renovated and replaced.
2. Project include existing 256 units at Alice Griffith housing complex that would be replaced
Source: San Francisco Redevelopment Agency, Lennar Urban.



SOURCE: Lennar, BVHP, LLC, 2009.

FIGURE 3: CANDLESTICK POINT - HUNTERS POINT SHIPYARD PHASE II PROPOSED LAND USE PLAN

Implementation of the Development Plan would require amendments to the *Bayview Hunters Point (BVHP) Redevelopment Plan* adopted in 2006 and the *Hunters Point Shipyard (HPS) Redevelopment Plan* adopted in 1997. The Candlestick Point Activity Node program allowed for a new San Francisco 49ers football stadium, and 1.2 million square feet of retail uses, both of which are not planned for in the current plan. The 1997 HPS Redevelopment Plan allows a different mix of industrial and commercial uses than the uses now proposed under the Development Plan.

Design for Development (D4D) documents that would apply in each of the redevelopment plan areas would accompany the Development Plan. The D4D document would include the standards for provision of off-street parking spaces and freight loading facilities, as well as bicycle parking and shower and locker facilities. In combination with the Development Plan, the D4D documents would supersede the San Francisco Planning Code for the CP-HPS Phase II Development Plan.

The Candlestick Point area of the Development Plan is immediately east of Executive Park, with the Bayview neighborhood to the north, the HPS to the north and east, and Candlestick Point State Recreation Area (SRA) along the Bay frontage, shown in **Figure 3.** The Candlestick Point area of the Development Plan is generally bounded by Hawes Street to the northwest, Candlestick Cove and the San Francisco Bay to the south, South Basin to the east, and Jamestown Avenue to the southwest. The northern boundary of Hawes Street is limited to the San Francisco Housing Authority's (SFHA) Alice Griffith public housing site between Gilman and Carroll Avenues, which extends north from Arelious Walker Drive.

The HPS Phase II area is to the southeast of the Bayview neighborhood. As shown in **Figure 3**, the HPS Phase II area is generally bounded by the San Francisco Bay to north, south and east. The south end of the western boundary extends from Yosemite Slough along Arelious Walker Drive to approximately Crisp Avenue, excluding the University of California San Francisco (UCSF) property. The northern boundary generally extends along Crisp and Spear Avenues. The northernmost end of the HPS Phase II area is contiguous with Earl Street and the southeastern boundary of the India Basin Shoreline area.

The 49ers Stadium subarea would provide a site for a new 69,000-seat National Football League stadium for the San Francisco 49ers. This subarea is on the southern half of HPS Phase II, with the stadium footprint on about 17 acres. The stadium would include about 1,860,000 gsf, with seating, ramps and stairs, office and administrative facilities, food service and retail areas, and access facilities for stadium visitors, players, and staff. Other secondary events could occur at the stadium including college football games, soccer games, concerts, festivals, antique and car shows, and other events. These secondary events would be limited to 20 total occurrences per year.

The parking areas surrounding the 49ers Stadium would serve stadium-related events. Dual-use fields adjacent to the proposed stadium and parking areas would serve as recreation and athletic fields when not used as parking for stadium events. The surface of the fields would be seeded grass above top soil with synthetic fibers and other base materials to support vehicle parking. The parking area and dual-use fields, on-site structures and street parking, and parking in the adjacent R&D park would provide approximately 16,415 parking spaces on game days. In addition, 1,000 spaces at Candlestick Center would be available for stadium parking on game-days. During non-game day activities, approximately 3,656 parking spaces would be available to serve the dual-use athletic fields and related events.

2.3 ROADWAY NETWORK IMPROVEMENTS

The Project would include a number of transportation improvements and the internal street network and roadway improvements were designed to support the transit, bicycle and pedestrian improvements. The Development Plan would improve existing roadways to serve Candlestick Point and Hunters Point Shipyard Phase II and surrounding the Bayview, South Basin, and Hunters Point neighborhoods. Roadway improvements would be within the CP-HPS Phase II Development Plan boundaries, and off-site as shown in **Figure 4**. Proposed roadway improvements would include the following:

Harney Way Widening: The existing four-lane Harney Way would widened to the north and south of its existing alignment, and would be rebuilt to contain between two and three travel lanes in each direction, turn pockets, two BRT-only lanes, Class I and Class II bicycle facilities, new sidewalks, as well as landscaped area. Initially, the roadway would be rebuilt as a new five-lane roadway (with right-of-way reserved for additional lane(s) to be built in the future as needed for increased traffic levels). There would be two lanes in each direction, with eastbound left-turn lanes at Thomas Mellon Circle and Executive Park Boulevard East and a westbound right-turn lane at the Executive Park Boulevard East intersection. **Figure 5** presents the initial phase of Harney Way widening. A Class II bicycle lane would be provided on the north side of the roadway, and a Class I bicycle path would be provided on the south side of the roadway. Two exclusive Bus Rapid Transit (BRT)[2] lanes would be constructed adjacent to the roadway on its north side. They would be separated from the roadway by a six-foot median that would widen to ten feet at the proposed BRT stops to allow for a passenger-loading platform. A BRT stop at the intersection of Harney Way and Thomas Mellon would serve the proposed Executive Park development. Six lanes would be constructed west of Thomas Mellon Drive to connect with the future modifications to the U.S. 101 interchange.

[2] Bus Rapid Transit (BRT) is an integrated system of facilities, services, and amenities that collectively improves the speed, reliability, and identity of bus rapid transit. BRT combines stations, vehicles, services, running ways (e.g., curb bus lanes, median busways, mixed-flow lanes), and Intelligent Transportation Systems (ITS) elements into an integrated system.

SOURCE: Fehr & Peers; AECOM

FIGURE 4: PROPOSED ROADWAY NETWORK IMPROVEMENTS

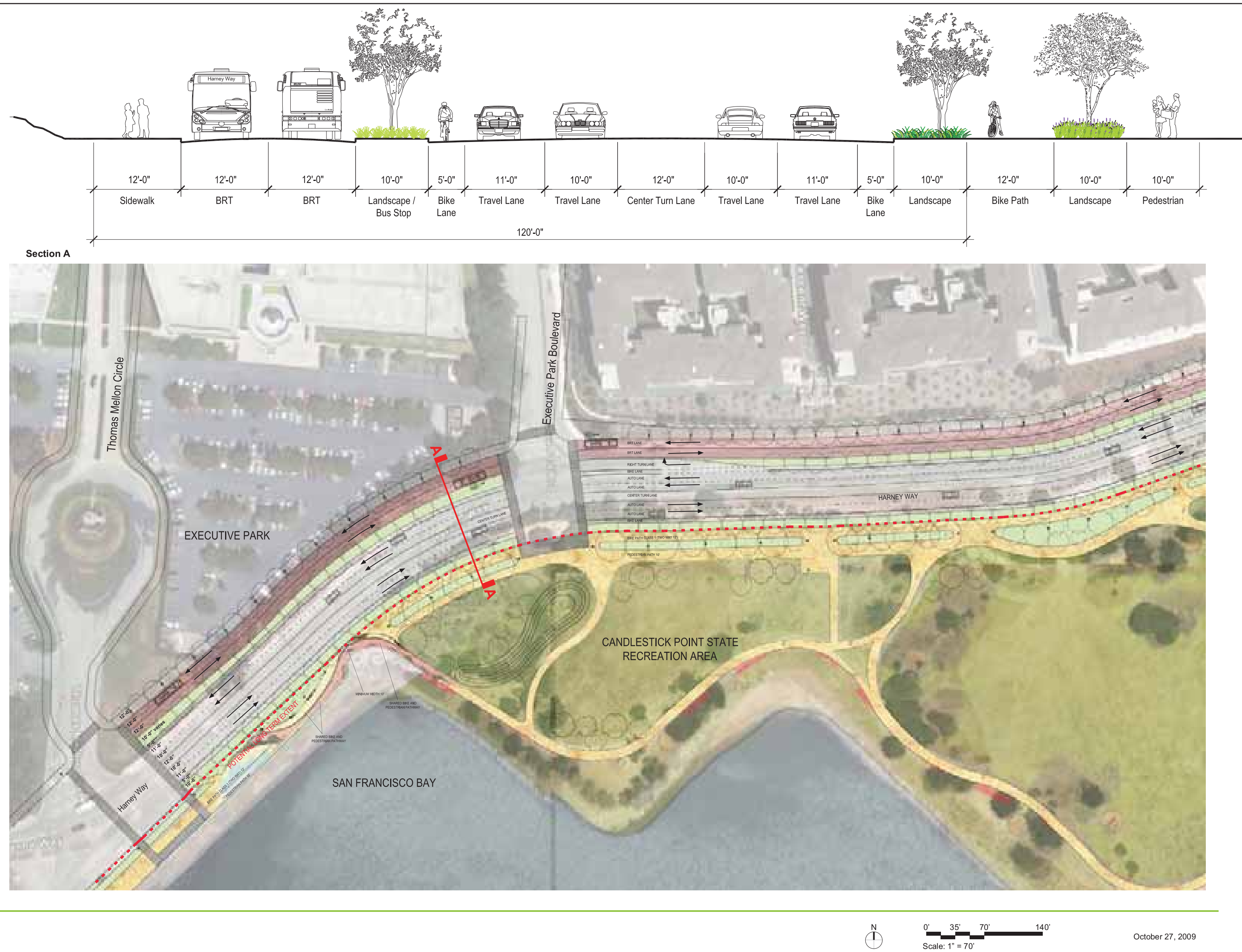


FIGURE 5: PROPOSED HARNEY WAY WIDENING - INITIAL CONFIGURATION

The BRT right-of-way has been designed to meet "rail ready" standards for future conversion to light rail, although such conversion is not contemplated in this Project. New traffic signals would be installed at these intersections. After games at the new 49ers stadium, left turns would be prohibited at the two Harney Way intersections with Thomas Mellon Drive and Executive Park Boulevard for a period to allow for the configuration of the roadway to change to four westbound auto lanes and one eastbound auto lane.

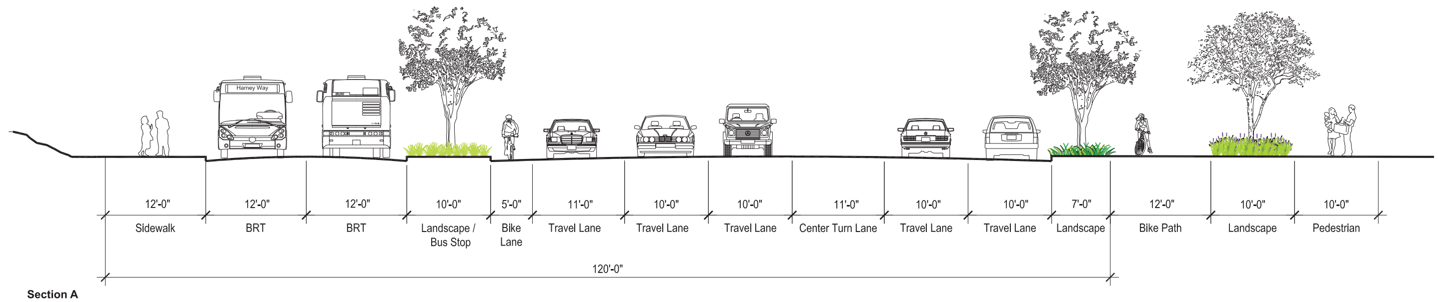
Under the final configuration, a portion of the landscaped area installed as part of the initial widening would be rebuilt to provide an additional lane from the proposed Harney Interchange east to Arelious Walker Drive, if necessary. **Figure 6** presents the final configuration of the Harney Way widening.

New and Improved Roadways – The street network proposed for Hunters Point Shipyard and Candlestick Point would be an extension of the existing grid of the adjacent Bayview neighborhood, using typical Bayview block sizes. Within Candlestick Point the extension and completion of the street network would enhance access between the existing neighborhoods and the existing and proposed waterfront park. Within Hunters Point Shipyard, the street grid would be aligned to focus on connections to the waterfront.

The internal street network would be composed of eight types of streets, as classified by the San Francisco Better Streets Plan (Draft for Public Review, June 2008): Commercial Throughway, Residential Throughway, Neighborhood Commercial Street, Neighborhood Residential Street, Mixed-Use Street, Parkway, Park Edge Street and Alley. Transportation Study Appendix C contains the proposed cross-sections for the various street types. Streets would be designed as complete streets consistent with the Better Streets Plan (Draft for Public Review, June 2008) to enable safe access for all users[3]. Proposed techniques would include driveway access management; traffic calming features such as signage and striping, pedestrian bulbouts where feasible at intersections, and refuge islands; streetscape amenities including street furniture, lighting, and plantings; and other features that would facilitate a high-quality pedestrian and bicycle network consistent with San Francisco's "Better Streets" Plan.

The spine of the Project's street network would be a continuous arterial beginning in the northwest of Hunters Point and traveling south to Candlestick Point. The portion of the arterial within Hunters Point would incorporate Innes Avenue, Robinson Street, and Crisp Avenue. The portion of the arterial connecting Hunters Point and Candlestick Point would incorporate a new Underwood Avenue extension and an improved Ingalls Street and Carroll Avenue. The reconfigured Arelious Walker Drive on the western edge of Candlestick Point would connect to an improved Harney Way at the southernmost point of Candlestick Point.

[3] Complete Streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and transit riders of all ages would be able to safely move along and across a complete street.



Under final configuration, a portion of the landscaped area may be rebuilt to provide an additional lane from the proposed Harney Interchange east to Arelious Walker Drive, if necessary.

FIGURE 6: PROPOSED HARNEY WAY CONFIGURATION - ULTIMATE CONFIGURATION

The Hunters Point Shipyard and Candlestick Point arterial streets would function as the primary thoroughfares of the Project, with generally perpendicular collector, parkway and park edge streets playing a subordinate role. BRT lanes would be on the north side of Harney Way before diverting through the Candlestick Point site, using the Yosemite Slough bridge to reach Hunters Point Shipyard. Automobiles would not be permitted to use the Yosemite Slough bridge except on game days, and would instead be routed via Carroll Avenue, Ingalls Street, Thomas Avenue, and Griffith Street. The local streets that form the balance of the street network would be Neighborhood Residential streets.

Hunters Point Shipyard would be served by a four-lane roadway extension of Thomas Avenue connecting to Arelious Walker Drive and Crisp Avenue via Griffith Street. Ingalls Street would contain two travel lanes and on-street parking/loading on both sides of the roadway. The existing portion of Thomas Avenue would be converted from a two-lane to a four-lane facility. On Thomas Avenue, parking would be retained on both sides of the roadway. Innes Avenue east of Donahue Street would be reconfigured to provide for two travel lanes in each direction and on-street parking on both sides of the roadway (this segment was recently constructed as part of HPS Phase I and contains one travel lane in each direction).

Game Day Roadway Network – Several roadway lane configurations would be temporarily changed to allow for the efficient ingress and egress of auto traffic to and from the proposed 49ers stadium before and after games. These roadways include Innes Avenue, Robinson Avenue, and Fisher Avenue on the north side of the Hunters Point Shipyard; Crisp Avenue on the southern side of the Hunters Point Shipyard; Griffith Street, Thomas Avenue, and Ingalls Street between the Shipyard and Candlestick Point; and Arelious Walker and Harney Way on Candlestick Point. Additionally, the Yosemite Slough bridge would be opened to vehicular traffic during this period. The bridge would be able to carry four lanes of auto traffic before and after games. In all cases, a travel lane would be dedicated to the "off-peak" travel direction (away from the stadium pre-game and to the stadium post-game) for local traffic and emergency access vehicles. Traffic control officers would be stationed at major intersections.

Streetscape Improvements – Streetscape improvements are planned for several key Bayview Hunters Point roadways: Harney Way and Innes, Palou, Gilman, Ingerson, and Jamestown Avenues. These streets would serve as primary routes for pedestrians, bicyclists, transit riders, and drivers. They are proposed to enhance the safety and experience of road users and existing residents, and are consistent with San Francisco's "Better Streets" Plan.

Enhanced streetscape design, including street trees, sidewalk plantings, furnishings, and paving treatments would be designed to visually tie together the proposed Project with the greater Bayview neighborhood. Specific streetscape treatments would vary depending on existing right-of-way and traffic demands. Streetscape improvements would take into consideration visibility at STOP-sign controlled intersections.

Yosemite Slough Bridge – A new Yosemite Slough bridge would extend Arelious Walker Drive from Candlestick Point to Crisp Avenue in Hunters Point Shipyard. The bridge would have an 81-foot-wide right-of-way and would contain a 40-foot-wide landscaped greenway, two 11-foot-wide BRT lanes, a sidewalk, and a Class I bicycle path. On 49ers game days, the 40-foot-wide landscaped area would be converted to four peak direction travel lanes for game day auto traffic. The Yosemite Slough bridge would not be used for vehicular traffic at any other time, including secondary events at the new stadium.

The Yosemite Slough bridge is a fundamental component of the proposed BRT service between Hunters Point Shipyard and points to the west, including Candlestick Point, the Bayshore Caltrain station, and the Balboa Park BART station. It would be a continuation of the dedicated right-of-way for BRT on Harney Way and through Candlestick Point that, along with signal priority to BRT vehicles, is essential to provide direct, fast and reliable BRT service, and is designed to be "rail ready" (not to preclude possible conversion to light-rail).

The bridge sidewalk and Class I bicycle path would provide a direct connection between Candlestick Point and Hunters Point Shipyard for pedestrians and bicyclists at all times, and would reduce the potential for conflicts between BRT vehicles and motorists, pedestrians and bicyclists.

During game days, the 40-foot-wide landscaped median would serve as the primary and most-direct route between the stadium parking areas and U.S. 101. This route would minimize the intrusion of game day traffic onto local residential streets (by directing vehicles directly onto Harney Way) and reduce the duration of post-game congestion.

Other Off-site Improvements – The Development Plan includes installation of new traffic signals at existing unsignalized intersections as part of the transit preferential treatment[4] on Palou Avenue, or when traffic volumes warrant signalization at:

- Palou Avenue and Griffith Street
- Palou Avenue and Hawes Street
- Palou Avenue and Ingalls Street
- Palou Avenue and Jennings Street
- Palou Avenue and Keith Street
- Palou Avenue and Lane Street
- Carroll Avenue and Ingalls Street
- Thomas Avenue and Ingalls Street
- Arelious Walker Drive and Carroll Avenue
- Arelious Walker Drive and Gilman Avenue

[4] Transit preferential street treatments include measures (e.g. transit only lanes, traffic signal pre-emption, sidewalk bus bulbs) that would improve transit travel times and service by giving priority to transit vehicles when conflicts with cars occur.

- Arelious Walker Drive and Ingerson Avenue
- Arelious Walker Drive and Harney Way
- Pennsylvania Avenue/25th Street
- Evans/Jennings/Middlepoint

At the intersection of **Evans/Jennings/Middlepoint**, in addition to signalization, the Project would also revise the existing lane configuration on the Evans Avenue and Jennings Street approaches. The eastbound and westbound approaches of Evans Avenue at Jennings Street currently have three lanes (one left turn lane, a through lane, and a shared through-right turn lane). Neither on-street parking nor bicycle lanes are provided on the segment of Evans Avenue roughly 600 feet to the east, and 400 feet to the west of Jennings Street. Jennings Street has one lane in each direction, with on-street parking permitted on both sides of the street.

- The Project improvement would reconfigure the existing three travel lanes on Evans Avenue for both the eastbound and westbound approaches to provide a shared through and left turn lane, a through lane, and a right turn lane. As indicated above, since there are no bicycle lanes or on-street parking, this reconfiguration of the existing lanes would not impact parking or bicycle travel.
- The Project improvement would also reconfigure the southbound approach of Jennings Street to Evans Avenue to provide a southbound left turn pocket, and a shared southbound through and right turn lane. The reconfiguration of the southbound approach would require displacement of about 200 feet of on-street parking on the west side of Jennings Street, which would eliminate about 8 to 10 parking spaces.

At the intersection of **Palou/Griffith/Crisp**, in addition to signalization, the Project would revise the existing lane configuration on the westbound Crisp Avenue, eastbound Palou Avenue and northbound Griffith Street approaches. As presently configured, there are six approaches at the intersection. All approaches of the intersection have one lane per approach (a shared left-through-right lane). Griffith Street, Palou Avenue, and Crisp Avenue have on-street parking on both sides of the street, and there are industrial loading/unloading zones on segments of Palou Avenue. Palou Avenue is designated as a Class III bicycle route (Bicycle Route #70). There are no bicycle lanes on Palou Avenue.

- The Project would reconfigure the intersection by removing the southwest leg of Crisp Avenue and creating limited access for the eastern block of Palou Avenue. The Crisp Avenue westbound approach, which is a Project roadway, would be restriped to provide two approach lanes, a left turn lane and a shared left/through/right lane.
- The Project would also reconfigure the northbound Griffith Street approach to provide two lanes, a shared left/through/right turn lane and a right turn lane. Additionally, the eastbound approach of Palou Avenue would be reconfigured to provide two approach lanes, a left turn lane and a shared through and right turn lane. The reconfiguration of the northbound approach would require displacement of about 200 feet of on-street parking on the east side of Griffith Street, which would eliminate about 8 to 10 parking spaces.

At the intersection of **Carroll/Ingalls**, in addition to signalization, the Project would revise the existing lane configuration on the westbound approach of Carroll Avenue, the southbound approach of Ingalls Street, and the eastbound approach of Carroll Avenue. The northbound and southbound approaches currently have one travel lane and on-street parking in each direction. The westbound approach of Carroll Avenue has three approach lanes, a shared left and through lane, a through lane, and a right turn lane. There is on-street parking on the southern side of the street. The eastbound approach has a travel lane (shared left/through/right lane) and on-street parking on the southern side of the street. Carroll Avenue is designated as a Class III bicycle route (Bicycle Route #805).

- The Project would reconfigure Carroll Avenue to provide two travel lanes and a bicycle lane in each direction. This would allow for a shared left turn and through lane, and a shared through and right turn at both the east- and westbound approaches. The southbound approach would be reconfigured to allow for two approach lanes: a left turn lane, and a shared through and right turn lane. The reconfiguration of the southbound approach would require displacement of about 200 feet of on-street parking/loading on the west side of Ingalls Street.

At the intersection of **Thomas/Ingalls,** in addition to signalization, the Project would revise the existing lane configuration on the westbound approach of Thomas Avenue. As presently configured all approaches of the intersection have one lane per approach (shared left/through/right lane) and on-street parking on both sides of the street. There are no bicycle facilities provided.

- The Project improvement would reconfigure the westbound approach of Thomas Avenue to Ingalls Street to provide two lanes, a left turn lane and a shared through and right turn lane. Thomas Avenue would be reconfigured to provide two travel lanes in each direction and on-street parking on both sides of the street.

Transportation Management System: The Project would include a transportation management system. The system would include the installation and coordination of existing and new signals at over 30 intersections in the Project vicinity and the surrounding area using fiber-optic technology including several changeable message signs and lane use control signals on roadways with reversible lanes. A Transportation Management Center near the 49ers stadium site would operate the system on game days. The Transportation Management Center would be operated by SFMTA.

2.4 TRANSIT NETWORK IMPROVEMENTS

The Transportation Plan for Project includes the following transit improvements, which were assumed as part of the future transportation network:

- Extension of existing Muni routes to better serve the Project area;
- Increased frequencies on existing routes to provide more capacity; and,
- Provision of new transit facilities and routes to better serve the Development Plan's proposed land use program and transit demand.

New direct transit service is proposed to serve employment trips to downtown San Francisco. Connections to the regional transit network (BART and Caltrain) would serve employment centers in the South Bay. Many of the proposed transit lines would include transit priority systems that use sensors to detect approaching transit vehicles and alter signal timings to improve transit efficiency. The analyses and proposals documented in this report acknowledge three components that must be funded in order to expand transit services. First, operating costs must be provided on an ongoing basis to underwrite the drivers, mechanics, supervisors, schedulers and other staffing necessary to put additional service in place, and these are costed on a fully-allocated funding basis. Secondly, additional transit vehicles are needed to provide any service expansion. In the Project service plan these include standard 40-foot diesel (now hybrid diesel-electric) motor coaches, 60-foot articulated motor coaches, 40-foot electric trolley coaches, and 73-foot electric light rail vehicles. Lastly, and particularly because the magnitude of new transit services proposed is substantial, funding to expand maintenance and storage facilities to accommodate these expanded fleets must also be provided. The proposed transit improvements are illustrated in **Figure 7** and are described below:

Extended bus routes and new bus routes: Existing Muni routes 23-Monterey, 24-Divisadero, 44-O'Shaughnessey, 48-Quintara-24th Street, and 54-Felton would be extended to Hunters Point Shipyard; the 29-Sunset would terminate at Candlestick Point. Service frequencies on these lines would be increased. Capacity on the T-Third route would be increased by operating two-car trains instead of single-car trains. A new Downtown Express route would connect both Candlestick Point and Hunters Point Shipyard with the Financial District. The Hunters Point Shipyard Downtown Express would have a stop on Innes Avenue to serve India Basin.

BRT Service: BRT service to connect the Project with the Bayshore Caltrain station and the Balboa Park BART station would be provided. The 28L-19th Avenue would be extended from its proposed TEP[5] terminus on Geneva Avenue (just east of Mission Street), to the east along

[5] TEP = Transit Effectiveness Project. SFMTA is currently initiating environmental assessment of the recommendations resulting from its Transit Effectiveness Project. The TEP is a comprehensive review of Muni operations, with numerous proposals for service and street network changes to address issues related to reliability, travel times and service areas.

SOURCE: Fehr & Peers; AECOM

FIGURE 7: PROPOSED TRANSIT IMPROVEMENTS

Geneva Avenue and Harney Way, across the proposed Yosemite Slough bridge, and into the Hunters Point Shipyard Transit Center. The 28L-19th Avenue currently operates during the morning (7 to 9 AM) and afternoon (2 to 4 PM) peak periods. With TEP improvements, limited stop service on the 28L-19th Avenue would operate from 9 AM to 6 PM. Harney Way/Geneva corridor would have exclusive bus and BRT lanes between the Hunters Point Transit Center and Bayshore Boulevard, through Candlestick Point and the Bayshore Caltrain Station.

Harney/Geneva BRT/Transit Preferential Street: The Harney Way/Geneva corridor would have exclusive bus and BRT lanes between the Hunters Point Transit Center and Bayshore Boulevard, through Candlestick Point and the Bayshore Caltrain Station.

Hunters Point Transit Center: The Hunters Point Transit Center would serve Hunters Point Shipyard and the Hunters Point Village Center subareas. The transit center would have approximately ten bus bays and the seven bus lines serving HPS would terminate at the center.

Bus Rapid Transit Stops: BRT stops would be at the Hunters Point Shipyard Transit Center, at three locations within Candlestick Point, and at two intermediate locations.

Palou Avenue Transit Preferential Street: The 24-Divisadero line would be extended along Palou Avenue to serve the Hunters Point Shipyard Transit Center. In addition, the 23-Monteery and the 44-O'Shaughnessey lines would continue to use Palou Avenue. Transit-priority technology would be installed on Palou Avenue including new traffic signals along Palou Avenue at Griffith, Hawes, Ingalls, Jennings, Keith and Lane Streets or other transit priority treatments.

2.5 BAY TRAIL, BLUE GREENWAY, AND BICYCLE CIRCULATION IMPROVEMENTS

The Project would include the construction of the regionally adopted Bay Trail in the southeastern portion of San Francisco, and incorporation of the Blue Greenway, a network of enhanced pedestrian and bicycle links in through the eastern portion of San Francisco to the waterfront. Trail improvements would include a pedestrian and bicycle trail along the shoreline with connections to the existing and new parks, from the western boundary of Candlestick Point near the Harney Way/U.S. 101 interchange, through the SRA, Yosemite Slough, and HPS shoreline to India Basin. The Bay Trail would be incorporated into the design of the parks.

Bikeways would provide connections within the Project and the surrounding neighborhoods and other parts of the City, including exclusive bikeways on the proposed Yosemite Slough bridge. Bicycle lanes would be provided along major roadways, consistent with City guidelines, and it is anticipated that as the street network develops, the bicycle facilities would be incorporated into the official Bicycle Route network. The Bay Trail would be extended along the entire Project waterfront. There would be bicycle parking in each commercial parking facility and residential garages. New commercial buildings with at least 20,000 gsf of floor area, as well as other facilities and attractions would provide locker and shower facilities. Bicycle racks would also be installed in parks, and along the streetscape of commercial and some residential streets. The proposed bicycle facilities and Bay Trail improvements within Hunters Point Shipyard and Candlestick Point are presented in **Figure 8**.

2.6 PEDESTRIAN CIRCULATION IMPROVEMENTS

The pedestrian network would encourage walking as a primary mode of transportation within the Project site, and with separated pedestrian pathways, between Hunters Point and Candlestick Point on the Yosemite Slough bridge. Sidewalk and multi-use pathways would allow access to transit facilities and to shopping, schools, and recreation. The interior roadway network would include traffic calming features to facilitate safe pedestrian travel. The streets would be designed to accommodate multi modal travel with features including curb extensions, intersection bulb-outs, raised crosswalks, comprehensive signage, street trees, narrow roadway lanes, and short blocks and other features to slow auto traffic. All pedestrian facilities would meet American with Disabilities Act (ADA) standards and are designed to conform to San Francisco's "Better Streets Plan" wherever possible. The proposed pedestrian circulation plan for Candlestick Point and Hunters Point Shipyard is presented on **Figure 9**.

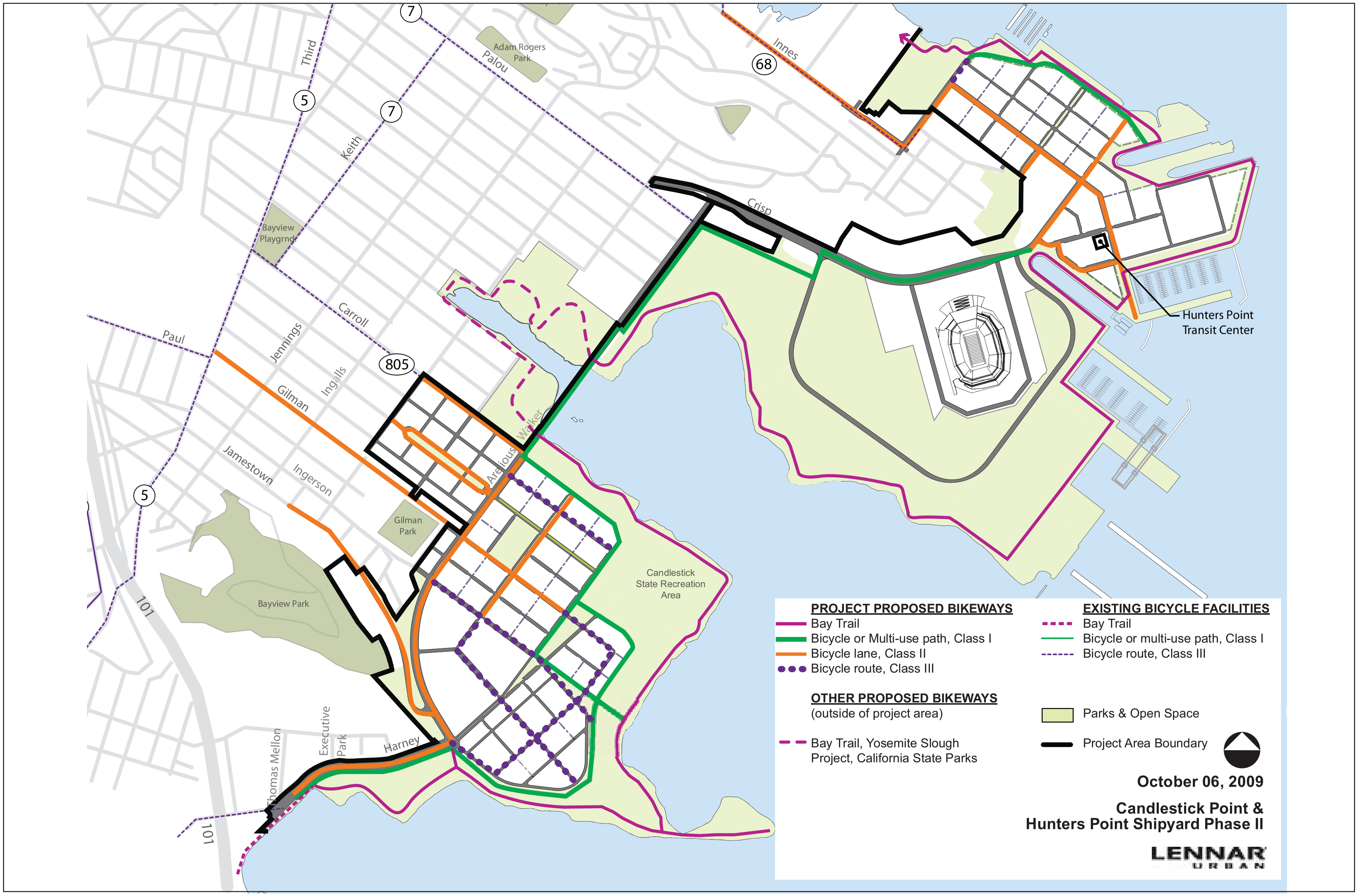
2.7 PARKING SUPPLY

Development within Hunters Point Shipyard and Candlestick Point would include off-street parking to accommodate residents, visitors and employees. The parking supply would be based on the D4D standards for the Project. In addition, on-street parking would be provided on a number of streets to support commercial and residential uses. The estimates of parking supply within Candlestick Point and Hunters Point Shipyard are presented on **Figure 10**.

The 49ers stadium area would have about 16,415 parking spaces, and an additional 1,000 off-street spaces would be available during game days within the commercial parking garage at the Candlestick Park retail center, for a total supply of 17,415 spaces. **Figure 11** presents the proposed stadium game day parking supply.

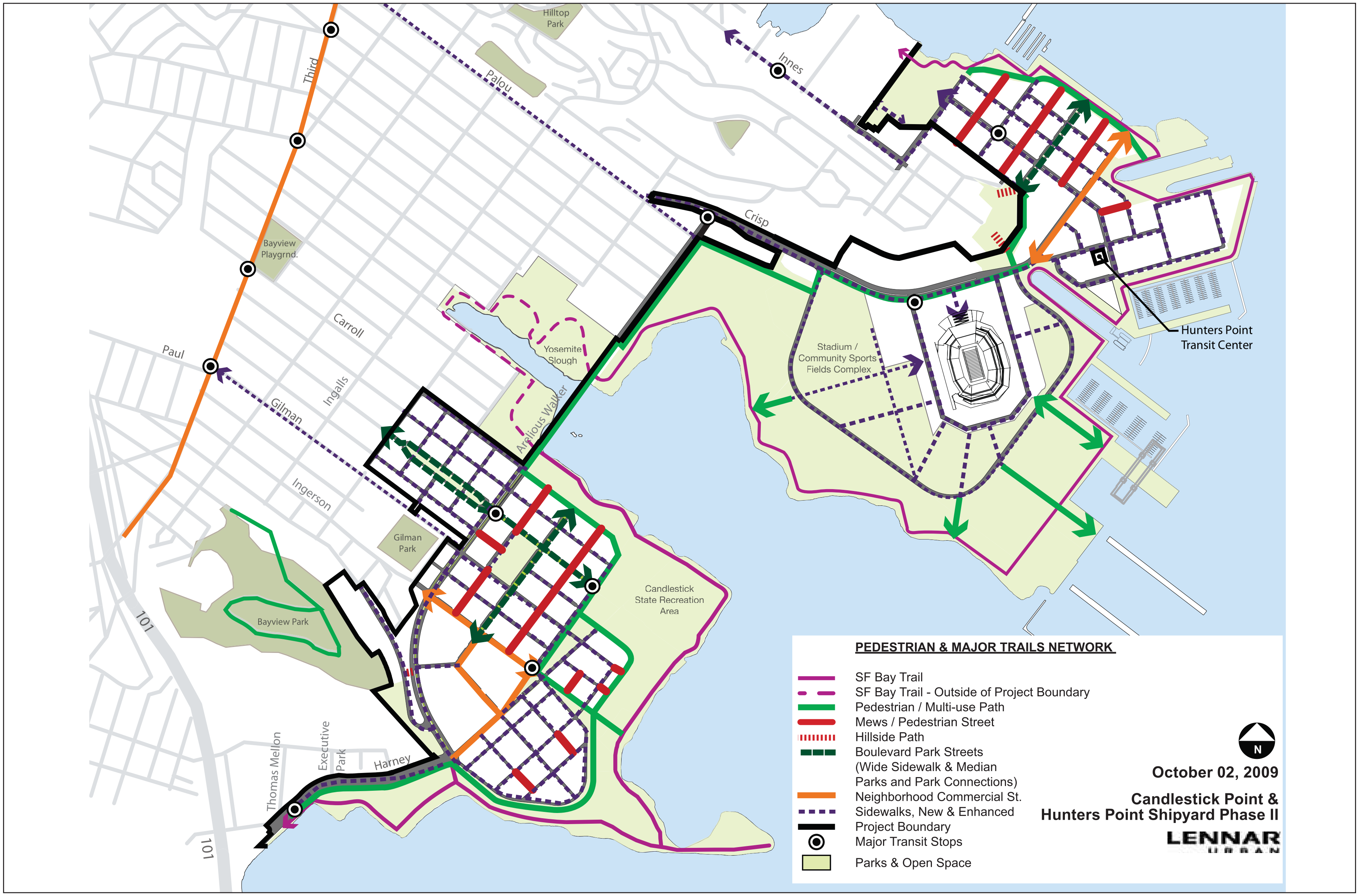
2.8 LOADING SUPPLY

Development within Hunters Point Shipyard and Candlestick Point would also include off-street freight loading facilities to accommodate loading and unloading activities (commercial delivery and moving trucks). The loading supply would be based on the D4D standards for the CP-HPS Phase II Development Plan, and would generally be consistent with Planning Code requirements for San Francisco. On-street loading spaces would serve as short-term parking near building entrances to meet the needs of disabled individuals, as a general convenience, and to allow package and other commercial deliveries.



SOURCE: Lennar Urban

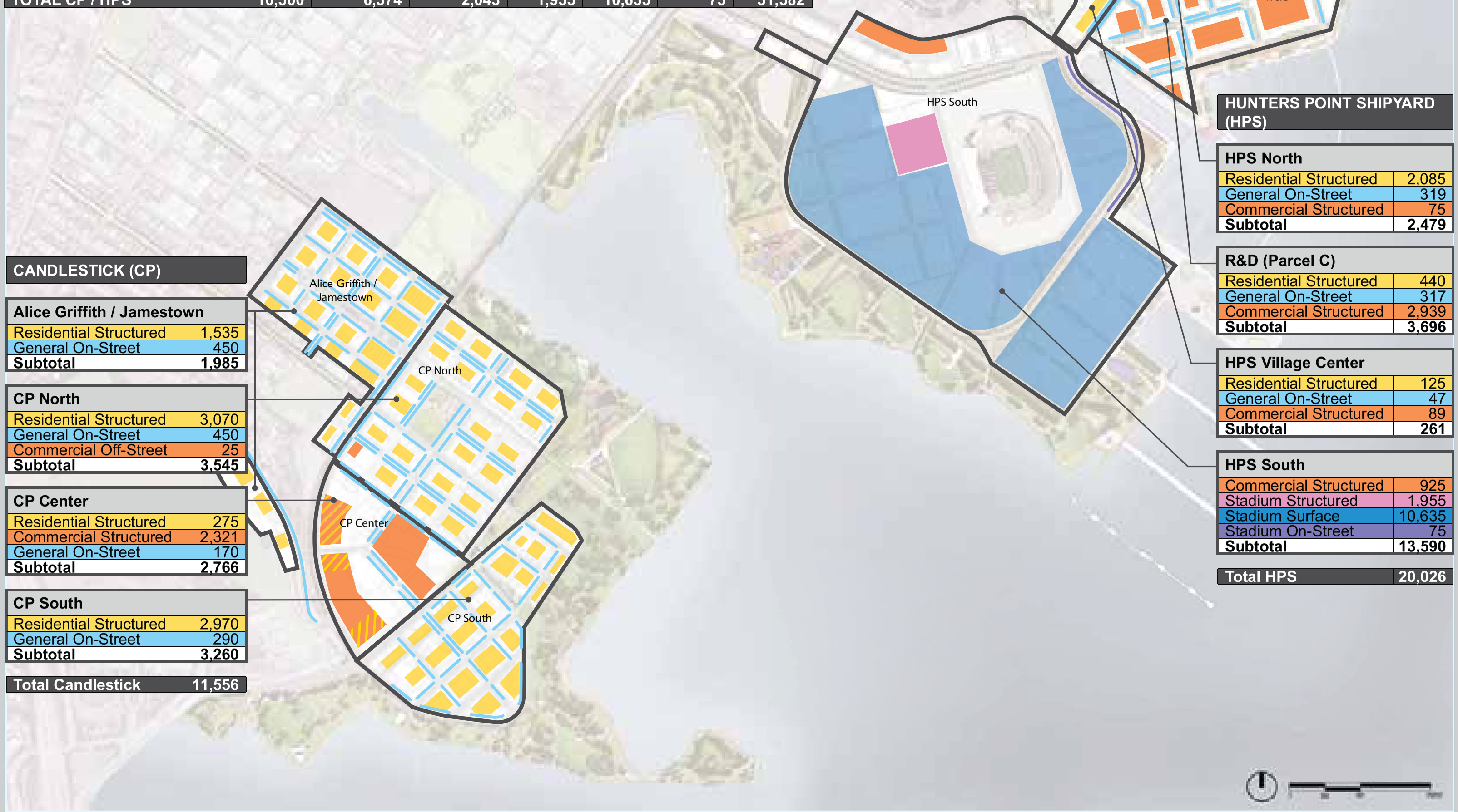
FIGURE 8: PROPOSED BICYCLE FACILITIES AND BAY TRAIL IMPROVEMENTS



SOURCE: Lennar Urban

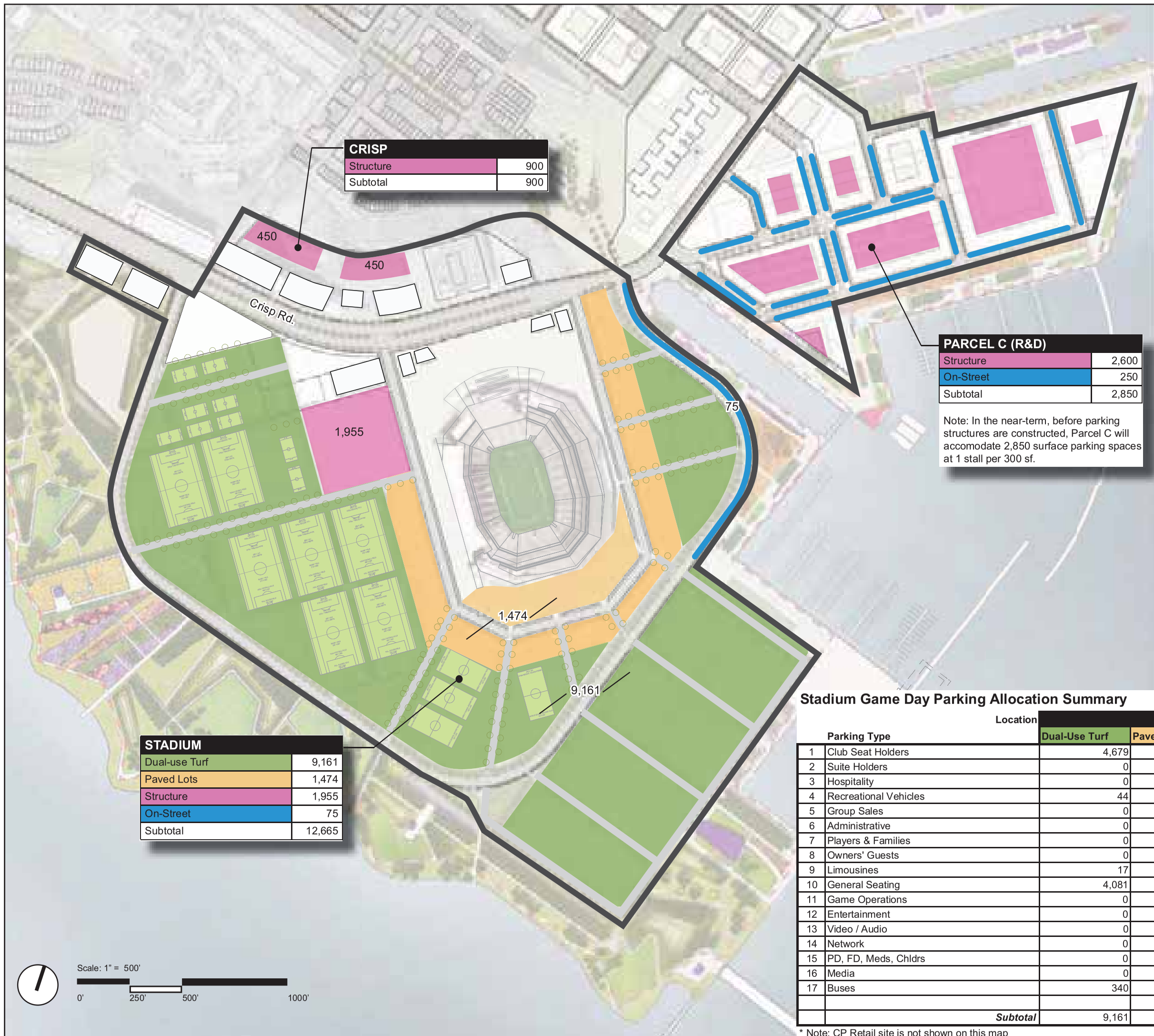
FIGURE 9: CP-HPS II PROPOSED PEDESTRIAN CIRCULATION PLAN

Parcel	Residential Structure	Commercial Structure/ Off-Street	General On-Street	Stadium Structure	Stadium Surface	Stadium Street	Total
CANDLESTICK POINT (CP)							
Alice Griffith / Jamestown	1,535	0	450	0	0	0	1,985
CP North	3,070	25	450	0	0	0	3,545
CP Center	275	2,321	170	0	0	0	2,766
CP South	2,970	0	290	0	0	0	3,260
Total CP	**7,850**	**2,346**	**1,360**	**0**	**0**	**0**	**11,556**
HUNTERS POINT SHIPYARD (HPS)							
HPS North	2,085	75	319	0	0	0	2,479
HPS Village Center	125	89	47	0	0	0	261
R & D (Parcel C)	440	2,939	317	0	0	0	3,696
HPS South	0	925	0	1,955	10,635	75	13,590
Total HPS	**2,650**	**4,028**	**683**	**1,955**	**10,635**	**75**	**20,026**
TOTAL CP / HPS	**10,500**	**6,374**	**2,043**	**1,955**	**10,635**	**75**	**31,582**



SOURCE: Lennar Urban

FIGURE 10: CP-HPS II PROPOSED PARKING SUPPLY



Legend

- Structure Parking
- Street Parking
- Surface Parking -- Paved Lots
- Surface Parking -- Dual-use Turf

Stadium Game Day Parking Allocation Summary

	Location	STADIUM					CRISP	PARCEL C			CP RETAIL*	TOTAL
	Parking Type	Dual-Use Turf	Paved Lots	Structure	On-Street	Subtotal	Structures	Structures	On-Street	Subtotal	Structures	
1	Club Seat Holders	4,679	0	0	0	4,679	0	0	0	0	0	4,679
2	Suite Holders	0	0	1,202	0	1,202	0	0	0	0	0	1,202
3	Hospitality	0	44	0	0	44	0	0	0	0	0	44
4	Recreational Vehicles	44	0	0	0	44	0	0	0	0	0	44
5	Group Sales	0	0	20	0	20	0	0	0	0	0	20
6	Administrative	0	0	25	0	25	0	0	0	0	0	25
7	Players & Families	0	220	0	0	220	0	0	0	0	0	220
8	Owners' Guests	0	60	0	0	60	0	0	0	0	0	60
9	Limousines	17	0	0	0	17	0	0	0	0	0	17
10	General Seating	4,081	680	483	75	5,319	900	2,600	250	2,850	1,000	10,069
11	Game Operations	0	0	225	0	225	0	0	0	0	0	225
12	Entertainment	0	30	0	0	30	0	0	0	0	0	30
13	Video / Audio	0	30	0	0	30	0	0	0	0	0	30
14	Network	0	60	0	0	60	0	0	0	0	0	60
15	PD, FD, Meds, Chldrs	0	200	0	0	200	0	0	0	0	0	200
16	Media	0	150	0	0	150	0	0	0	0	0	150
17	Buses	340	0	0	0	340	0	0	0	0	0	340
	Subtotal	9,161	1,474	1,955	75	12,665	900	2,600	250	2,850	1,000	**17,415**

* Note: CP Retail site is not shown on this map

SOURCE: Lennar Urban

FIGURE 11: PROPOSED STADIUM GAME DAY PARKING

The CP-HPS Phase II Development Plan also identifies roadways within the Project site for truck drivers to park while waiting for off-street loading spaces to become available and while resting between deliveries. Federal and state rules concerning safety related to hours of driving and mandatory rest periods require drivers to take a 10-hour rest period. Within Hunters Point Shipyard and Candlestick Point most parking lanes are 7 feet wide, however, curb lanes on the stadium Inner Ring Road and Outer Ring Road would be between 11 and 18 feet wide, which would accommodate most delivery trucks. An area of about 300 feet would be designated for truck parking only during non-game days.

2.9 TRANSPORTATION DEMAND MANAGEMENT PLAN

The CP-HPS Phase II Development Plan includes a commitment to develop and implement a Transportation Demand Management TDM Program designed to reduce use of single-occupant vehicles and to increase the use of rideshare, transit, bicycle and walk modes for trips to and from, as well as within the Project. The TDM program would be developed by a professional transportation consultant, in consultation with San Francisco Municipal transportation Agency (SFMTA) and the Planning Department. The program would establish target goals, monitoring program, and a reporting program to SFMTA and the Planning Department. A draft TDM Plan is included in Transportation Study Appendix B. The TDM Program would highlight the demand management qualities of the overall CP-HPS Phase II Development Plan, including:

1. **Jobs-Housing Linkage.** By providing a range of job types (retail, research, hospitality, office, etc.) and a range of housing types from affordable apartments to single family homes, the CP-HPS Phase II Development Plan would maximize the potential jobs/housing "matches" on site. Each match reduces the number of vehicle trips that would enter and leave the Project site during peak hours.

2. **Streets designed for low speed and safe crossings.** In addition to new residential and commercial buildings, the CP-HPS Phase II Development Plan would provide new infrastructure, including streets. All new streets and intersection upgrades would consider the needs of pedestrians and bicyclists.

3. **Land uses and transit located to encourage walking.** People walk more when destinations are within close proximity, along flat routes with easy street crossings, and through interesting areas with storefronts, street trees, street furniture and other pedestrian-oriented amenities. The CP-HPS Phase II Development Plan embraces these principles, with all homes located within a 15-minute walk of transit and neighborhood retail services integrated into residential blocks. Many existing neighborhoods would also benefit from their proximity to enhanced transit service, schools, retail locations, and jobs with the Project site.

The program would then describe a menu of TDM tools that, when employed, would make the most of the above design qualities of the Development Plan. These include:

Parking Strategies

1. **Visitor Variable, Market-Rate Parking Pricing.** Visitor parking charges at variable market rates would encourage transit use. This can be accomplished by increasing parking rates during the peak period when transit service is most frequent, or increasing parking rates progressively to favor short-term parking over long-term parking, discouraging commuter parking.

2. **Maximum Permitted Parking Ratios.** The Development Plan includes a maximum permitted of one off-street parking space per residential unit, as well as maximum permitted ratios for other development types.

3. **Flexible Parking Management Strategies.** Additional parking management strategies such as residential permit parking, time of day restrictions, parking technologies, and parking wayfinding would also be considered as needed to supplement other parking strategies.

4. **Unbundled Residential Parking.** As required for all new residential developments with more than 10 units in San Francisco, residential parking would be "unbundled" and sold or leased separately from units. Unbundling parking makes the cost of parking visible to households, and may encourage some residents to save money by opting for a single off-street space or no dedicated parking. Unbundled parking would also serve as a "self selection" incentive for residents who prefer to live in car-free or car-reduced neighborhoods.

Transit Strategies and Support Strategies

1. **Central Transit Hub.** A transit center at Hunters Point Shipyard would enable efficient and convenient transfers while providing a central location for transportation brochures and other information to be distributed and for attended bicycle parking. Major BRT stops throughout the Project site would also include information kiosks and real-time transit updates.

2. **Enhanced Transit Service and Bicycle Facilities.** Exclusive bike lanes and frequent bus rapid transit (BRT) service operating in dedicated lanes with signal priority, would offer convenient alternatives to driving to, from, and within the Project site. Additional transit service would include extended Muni routes, increased Muni frequencies, and enhanced connections to the regional network (BART and Caltrain).

3. **Bicycle Support Facilities.** Bicycle support facilities to encourage bicycling would include parking facilities in both residential and commercial developments (such as racks, indoor/long-term parking, lockers, and showers), attended bicycle parking and repair facilities at major destinations (with discounted rental space for a bike station at the Hunters Point Shipyard Transit Center), and potentially a bike sharing or rental program.

4. **Wayfinding.** A comprehensive wayfinding signage program would support the network of walkways and shared-use paths, encouraging pedestrian and bicycle trips.

5. **EcoPass.** Homeowner's dues would include the cost of transit passes. The transit pass or "EcoPass" would offer significant benefits including: a group discount (transit pass costs, while mandatory, would be priced significantly lower than individual passes because they are mandatory), a steady funding stream for enhanced transit service, and a "self selection" incentive – whereby more Eco-Minded (transit-inclined) residents would be attracted to live in the Project site.

6. **Carshare Services.** Local carshare organizations would provide carshare vehicles throughout the Project site. Carshare services, such as City CarShare and ZipCar, allow members to use vehicles when needed, paying based on how much they drive. Employers may include carshare memberships for their employees as an element of their mandatory TDM Program. For multi-unit housing developments, carshare vehicles may be provided in residential garages.

7. **Employee TDM Programs**. Employers of 20 or more employees in the Project site would be required to participate in TDM programs that would encourage the use of transit and facilitate walking and bicycling among their employees through both incentives and disincentives. Elements of the TDM programs may include:

   a. **Information Boards/Kiosks.** Employers would display transit routes and schedules; carpooling and vanpooling information; and bicycle lanes, routes, paths and facility information on information boards/kiosks or direct employees to web resources.

   b. **Commuter Benefits.** The TDM program would include participation in the Commuter Benefits program for tax-free paycheck deductions of transit and bicycle commuter expenses (a program mandatory for San Francisco employers of 20 or more employees).

   c. **Employee EcoPass.** Opportunities to provide employees with an "EcoPass" would be pursued, similar to the programs already underway at the University of California and the City of Berkeley. These passes would allow unlimited transit use and could be purchased at a discount bulk rate on a monthly and/or annual basis, and then be made available to all employees who work on the Project site.

d. **Carpool/Vanpools.** Through their TDM program and in collaboration with the On-Site TDM Coordinator, employers would offer carpool and vanpool matching services, subsidies, and priority accommodation. Designated and convenient spaces in parking facilities would be provided free to vanpools and carpools. The transit centers would also have designated signed areas for casual carpooling. Casual carpooling information would be provided through the On-Site Coordinator's TDM website, brochures, and targeted marketing.

e. **Guaranteed Ride Home Program.** A Guaranteed Ride Home program supported by employer participation would reimburse transit riders for return trip travel in the event of an emergency when an alternative means of travel is not available.

f. **Compressed Work Weeks, Flex Time, and Telecommuting.** Through these strategies, employees would adjust their work schedule to reduce vehicle trips to the worksite.

Implementation and Monitoring Strategies

1. **CP-HPS Transportation Management Association.** A CP-HPS Transportation Management Association would be formed to develop, implement, operate and administer strategies and programs to manage transportation resources in CP-HPS (including Phase I and Phase II) in accordance with the Transportation Demand Management Plan for CP-HPS.

2. **On-Site Transportation Coordinator and Website.** An On-site Transportation Coordinator would provide residents, employers, employees, and visitors with information regarding available transportation alternatives. The Transportation Coordinator would be responsible for implementation, monitoring, and improvement of the measures of the TDM plan. The Coordinator would maintain a website to include transportation-related data and real-time transit information. The Coordinator would serve as a liaison to City staff for all transportation concerns/communication needs.

3. **Targeted Marketing.** From the day that the first employee comes in to work and the first family moves in, a plan would be in place to help people discover alternatives to driving alone in a car. The On-Site Coordinator would be available to help people plan their trips and work with transportation agencies and others to promote transit, vanpooling, carpooling and carsharing, bicycling, and walking. In addition to one-on-one outreach, TDM brochures and a website would be available on an ongoing basis. A

yearly transportation options "fair" would also be scheduled for the neighborhood, with smaller outreach efforts available to employers and other organizations.

4. **Monitoring of Transportation Demand** The transportation measures and programs would all be monitored on an annual basis to determine the success of the programs and to allow the On-Site Coordinator to make decisions about the allocation of resources or changes in the services that may be needed to better address the needs of the Development Plan area. The objective of the monitoring would be to maximize the use of alternatives to the single occupant automobile and reduce peak hour congestion. A monitoring program could include user surveys, automobile counts, transit ridership, and bicycle and car share usage and costs.

5. **Monitoring Effectiveness of Congestion-Reducing and Traffic Calming Efforts.** As part of annual monitoring, the On-site Coordinator would, in cooperation with SFMTA, review the effectiveness of the Project's transportation measures and other traffic calming measures implemented in the area to reduce congestion due to Project vehicle trips and minimize traffic spillover to neighboring residential streets. If warranted, the On-Site Coordinator and SFMTA would consider implementation of additional traffic-calming and congestion-alleviating measures, such as adding additional lanes to the streets that approach Third Street, or other congested areas.

2.10 PROJECT PHASING

The Project would be implemented in four overlapping phases, with construction anticipated to be initiated in 2011 and completed by 2029. **Table 2** on page 27 presents the amount of development projected to be constructed at the end of each phase, as well as the transportation infrastructure improvements that would be implemented. As indicated in the table, the majority of development and infrastructure improvements would be completed by the end of the second phase, which has a scheduled completion date of 2021.

Table 2
Project Phasing of Land Use Program and Transportation Improvements

	Phase 1 2017	Phase 2 2021	Phase 3 2025	Phase 4 2029	Total
Land Use Program					
Hunters Point Shipyard					
Residential (units)	2,325	325	--	--	2,650
Neighborhood Retail (gsf)	60,000	65,000	--	--	125,000
Research & Development (gsf)	2,278,000	222,000	--	--	2,500,000
Artists Studios (gsf) 1	255,000	--	--	--	255,000
Community Services (gsf)	--	50,000	--	--	50,000
Marina (slips)	--	--	--	300	300
Stadium (seats)	69,000	--	--	--	69,000
Candlestick Point					
Residential (units)	795	2,520	3,255	1,280	7,850
Neighborhood Retail (gsf)	--	125,000	--	--	125,000
Regional Retail (gsf)	--	635,000	--	--	635,000
Office (gsf)	--	150,000	--	--	150,000
Hotel (rooms) [1]	--	220	--	--	220
Community Services (gsf)	--	50,000	--	--	50,000
Arena (seats)	--	10,000	--	--	10,000
Parkland (acres) [1]	*265*	*262*	*336*	*336*	*336*
Roadway Improvements [2]					
HPS – CP Roadway Network	X	X	X	X	--
Harney Way Widening	X	--	--	--	--
Palou TPS	X	--	--	--	--
Roadway Streetscape Improvements	X	--	--	--	--
Yosemite Slough Bridge	X	--	--	--	--
New Signals	X	--	--	--	--
Transportation Management Center	X	--	--	--	--
Transit Improvements [3]					
HPX – HPS Downtown Express	X	--	--	--	--
44-O'Shaughnessey Reroute	X	--	--	--	--
48-Q-24th Frequency & Reroute	X	--	--	--	--
24-Divisadero Extension	--	X	--	--	--
29-Sunset Increased Frequency	--	X	--	--	--
T-Third – 2-car trains	X	X	--	--	--
28L-19th Ave - BRT to HPS	--	X	--	--	--
29-Sunaset Extension to CP	--	X	--	--	--
CPX – Candlestick Downtown Express	--	X	--	--	--
28L-BRT Increased Frequency	--	--	X	--	--
Transit Center at HPS	--	X	--	--	--
Travel Demand Management Plan [3]	X	--	--	--	--

Notes:
1. At Project completion there would be 105 acres on Candlestick Point and 231 acres on Hunters Point Shipyard. Includes existing 120 acres on CSPRA lands.
2. Roadway network improvements include pedestrian and bicycle improvements.
3. TDM Plan and Transit Improvements are incorporated as Mitigation Measures 1 and 7, respectively.
Source: Lennar Urban, Fehr & Peers.

2.11 PROJECT VARIANTS AND ALTERNATIVES TO THE PROJECT

This section describes the five Project Variants and five Alternatives to the Project.

2.11.1 Project Variants

Five variants of the Project were formulated by the Redevelopment Agency, the City and Lennar Urban, and other stakeholders for purposes of the environmental analysis.

- Two variants address the scenario of the San Francisco 49ers moving to the City of Santa Clara with no football stadium constructed at Hunters Point Shipyard (HPS) Phase II. Those two variants include a different land use distribution at the HPS Phase II site. Compared to the Project, the development program of these variants at HPS Phase II would be increases in R&D space under the No Stadium—Additional Research and Development Variant (R&D Variant) and relocating residential units to HPS Phase II under the No Stadium - Housing Variant (Housing Variant).

- Three Candlestick Point tower variants (Variant 3) would have the same land use program and overall description as the Project, but would have different locations and heights for residential towers at Candlestick Point (Candlestick Point Tower Variants A, B, and C).

- A utilities variant (Variant 4) would include an automated solid waste collection system, decentralized wastewater treatment, and district energy.

- Variant 5 would include the scenario of a shared stadium where both the 49ers and Oakland Raiders would play at a new stadium at HPS Phase II

Project Variant 3 (Candlestick Point Tower) and Variant 4 (Utilities) would have the same development program and transportation network as the Project and therefore their transportation impacts would be the same. For this reason, these variants are not further discussed in the transportation study. Variant 5 (49ers/Raiders Shared Stadium) is assessed qualitatively because impacts would be similar to those identified for the Project conditions, however the number of times per year that these impacts would occur would double.

Table 3 summarizes the land use assumptions for the Project and for Project Variants 1 and 2. **Table 4** presents a comparison of the transportation network improvements for the Project and Project Variants.

Table 3
Summary of Project and Project Variants – Land Use Program

	Project	Project Variant 1 (R&D Variant)	Project Variant 2 (Housing Variant)
Hunters Point Shipyard			
Residential (units)	2,650	2,650	***4,000***
Neighborhood Retail (gsf)	125,000	125,000	125,000
Research & Development (gsf)	2,500,000	***5,000,000***	2,500,000
Artists Studios (gsf) [1]	255,000	255,000	255,000
Community Services (gsf)	50,000	50,000	50,000
Marina (slips)	300	300	300
Park (acres)	238	238	238
Stadium (seats)	69,000	--	--
Candlestick Point			
Residential (units) [2]	7,850	7,850	6,500
Neighborhood Retail (gsf)	125,000	125,000	125,000
Regional Retail (gsf)	635,000	635,000	635,000
Office (gsf)	150,000	150,000	150,000
Hotel (rooms)	220	220	220
Community Services (gsf)	50,000	50,000	50,000
Park (acres)	147	147	147
Arena (seats)	10,000	10,000	10,000

Notes:
1. Project and Variants includes 225,000 sf of existing artist studio space that would be renovated and replaced.
2. Project and Variants include existing 256 units at Alice Griffith housing complex that would be replaced.

Source: San Francisco County Redevelopment Agency, Lennar Urban.

Table 4
Summary of Transportation Improvements - Project and Project Variants

Improvement	Project	Project Variant 1 (R&D Variant)	Project Variant 2 (Housing Variant)
Harney Widening	X	X	X
New and Improved Roadways	X	X	X
Streetscape Improvements	X	X	X
Yosemite Slough Bridge	X	X	X
New Signals			
Palou/Griffith	X	X	X
Palou/Hawes	X	X	X
Palou/Ingalls	X	X	X
Palou/Jennings	X	X	X
Palou/Keith	X	X	X
Palou/Lane	X	X	X
Carroll/Ingalls	X	X	X
Thomas/Ingalls	X	X	X
A. Walker Dr/Carroll	X	X	X
A. Walker Dr/Gilman	X	X	X
A. Walker Dr/Ingerson	X	X	X
A. Walker Dr/Harney	X	X	X
Pennsylvania/25th	X	X	X
Evans/Jennings/Middlepoint	X	X	X
Intersection Improvements			
Evans/Jennings/Middlepoint	X	X	X
Palou/Griffith/Crisp	X	X	X
Carroll/Ingalls	X	X	X
Thomas/Ingalls	X	X	X
Transp Management System			
Extended & New Bus Routes	X	X	X
BRT Service	X	X	X
Harney/Geneva BRT/TPS	X	X	X
Hunters Point Transit Center	X	X	X
BRT Stops	X	X	X
Palou Avenue TPS	X	X	X
Bay Trail & Bicycle Improvements	X	X	X
Pedestrian Improvements	X	X	X
TDM Plan	X	X	X

Source: Lennar Urban, Fehr & Peers.

Variant 1 – No Stadium - R&D Variant

Variant 1 assumes that the 49ers stadium would not be constructed at Hunters Point Shipyard, and, instead, the 49ers would move to the City of Santa Clara. Under Project Variant 1, an additional R&D uses would be developed. As indicated in **Table 3** above, the land use program would be the same as for the Project, with the exception that 5,000,000 sf of research and development space, rather than 2,500,000 sf of R&D space would be developed at Hunters Point Shipyard. Variant 1 assumes the same roadway and transit improvements as the Project, including construction of the Yosemite Slough bridge. However, the bridge would be narrower than the bridge included as part of the Project, with a 39-foot wide right-of-way to accommodate two 11-foot wide BRT lanes, a sidewalk, and a Class I bicycle path.

Variant 2 – No Stadium – Housing Variant

Variant 2 also assumes that the 49ers stadium would not be constructed at Hunters Point Shipyard, and, that instead the 49ers would move to the City of Santa Clara. The land use program would be the same as for the Project, with the exception that 4,000 residential units, rather than 2,650 units, would be developed at Hunters Point Shipyard. As with Variant 1, Variant 2 assumes the same roadway and transit improvements as the Project, including construction of the Yosemite Slough bridge. The bridge would be narrower than the bridge included as part of the Project, with a 39-foot wide right-of-way to accommodate two 11-foot wide BRT lanes, a sidewalk, and a Class I bicycle path.

Variant 3 – Candlestick Point Tower Variants (Tower Variants A, B, and C)

The three Candlestick Point Tower Variants (Tower Variants A, B, and C) would have the same overall land use program as the Project. While there would be additional towers under these variants, the total number of residential units would remain the same as the Project. Transportation impacts associated with this variant would be the same as the Project, and are therefore not addressed further in the transportation study.

Variant 4 – Utilities

The Utilities Variant assumes the implementation of additional on-site utility infrastructure, including (1) district heating and cooling, (2) on-site wastewater treatment, and (3) an automated trash collection system. All land uses at Candlestick Point and the HPS Phase II site would be constructed at the same locations and at the same intensities proposed under the Project, although some minor shifts in building locations could occur to accommodate some elements of the proposed utility systems, which would require some additional built space. Transportation impacts associated with this variant would be the same as the Project, and are therefore not addressed further in the transportation study.

Variant 5 – SF 49ers and Oakland Raiders Shared Stadium at Hunters Point Shipyard

This variant assumes that both the 49ers and the Oakland Raiders would play home games at the new stadium at Hunters Point Shipyard. This variant addresses the requirement of the National Football League for NFL teams in close geographic proximity to one another to evaluate the potential shared use of a stadium. There currently are no specific plans for use of the stadium by a second NFL team.

This variant would have the identical land uses as the Project, however, the number of days during which football games would occur at the stadium would increase. Given that teams typically play half of all pre-season, post-season, and regular season games at home, the use of the stadium by two NFL teams could result in one NFL event at the stadium occurring every week from the beginning of the pre-season in August through the end of December for up to 24

NFL events per year. In addition, there would also be up to 20 secondary smaller events at the stadium per year.

2.11.2 Alternatives to the Project

As noted above, five Alternatives to the Project are analyzed in the transportation study. **Table 5** summarizes the land use assumptions for the Project and for the five Alternatives to the Project. **Table 6** presents a comparison of the transportation network improvements for the Project and the Alternatives to the Project.

Table 5
Summary of Project and Alternatives to the Project – Land Use Program

	Project	Alt 1 No Project	Alt 2 No Bridge	Alt 3 49ers at Candlestick	Alt 4 Lesser Build	Alt 5 No Park Agreement
Hunters Point Shipyard						
Residential (units)	2,650	1,800	2,650	4,000	1,855	4,000
Neighborhood Retail (gsf)	125,000	570,000	125,000	125,000	87,500	125,000
R&D (gsf)	2,500,000	1,087,000	2,500,000	2,500,000	1,750,000	2,500,000
Artists Studios (gsf) [1]	255,000	225000	255,000	255,000	255,000	255,000
Community Services (gsf)	50,000		50,000	50,000	50,000	50,000
Park (acres)	231		231	245	231	245
Stadium (seats)	69,000		69,000			
Mixed Use		580,000				
Cultural and Education		330,600				
Candlestick Point						
Residential (units) [2]	7,850	256 [3]	7,850	1,210	5,495	6,500
Neighborhood Retail (gsf)	125,000		125,000		87,500	125,000
Regional Retail (gsf)	635,000		635,000		444,500	635,000
Office (gsf)	150,000		150,000		105,000	150,000
Hotel (rooms)	220		220		154	220
Community Services (gsf)	50,000		50,000		50,000	50,000
Park (acres)	105	120 [4]	105	120 [4]	147	126
Arena (seats)	10,000		10,000		10,000	10,000

Notes:
1. Project and Alternatives include 225,000 sf of existing artist studio space that would be renovated and replaced.
2. Project and Alternatives include existing 256 units at Alice Griffith housing complex that would be replaced.
3. Existing 256 units at Alice Griffith housing complex.
4. Existing 120 acres of State Park lands within project area.

Source: San Francisco County Redevelopment Agency, Lennar Urban.

Table 6
Summary of Transportation Improvements - Project and Alternatives to the Project

Improvement	Project	Alt 1 No Project	Alt 2 No Bridge	Alt 3 49ers at Candlestick	Alt 4 Lesser Build	Alt 5 No Park Agreement
Harney Widening	X	--	X	--	X	X
New and Improved Roadways	X	--	X	--	X	X
Streetscape Improvements	X	--	X	--	X	X
Yosemite Slough Bridge	X	--	--	X	--	--
New Signals						
Palou/Griffith	X	X	X	X	X	X
Palou/Hawes	X	--	X	X	X	X
Palou/Ingalls	X	--	X	X	X	X
Palou/Jennings	X	--	X	X	X	X
Palou/Keith	X	--	X	X	X	X
Palou/Lane	X	--	X	X	X	X
Carroll/Ingalls	X	--	X	X	X	X
Thomas/Ingalls	X	--	X	--	X	X
A. Walker Dr/Carroll	X	--	X	--	X	X
A. Walker Dr/Gilman	X	--	X	--	X	X
A. Walker Dr/Ingerson	X	--	X	--	X	X
A. Walker Dr/Harney	X	--	X	--	X	X
Pennsylvania/25th	X	--	X	X	X	X
Evans/Jennings/Middlepoint	X	--	X	X	X	X
Intersection Improvements						
Evans/Jennings/Middlepoint	X	--	X	X	X	X
Palou/Griffith/Crisp	X	X	X	X	X	X
Carroll/Ingalls	X	--	X	--	X	X
Thomas/Ingalls	X	--	X	--	X	X
Transp Management System	X	--	X	X	X	X
Extended & New Bus Routes	X	--	X	X	X	X
BRT Service	X	--	X	X	X	X
Harney/Geneva BRT/TPS	X	--	X	X	X	X
Hunters Point Transit Center	X	--	X	X	X	X
BRT Stops	X	--	X	X	X	X
Palou Avenue TPS	X	--	X	X	X	X
Bay Trail & Bicycle Improvements	X	--	X	X	X	X
Pedestrian Improvements	X	--	X	X	X	X
TDM Plan	X	--	X	X	X	X

Source: Lennar Urban, Fehr & Peers.

Alternative 1 – No Project

Alternative 1 assumes that the CP-HPS Phase II Development Plan would not be implemented and that the land uses proposed under San Francisco Proposition G, the legislation that enabled the CP-HPS Phase II Development Plan, would not be pursued. Development regulations and zoning would revert to the regulations that were in place prior to passage of Propositions D and F and establishment of the Candlestick Point Special Use District[6].

Alternative 1 assumes that the program included in the existing Hunters Point Shipyard Redevelopment Program would be built out. No new development is assumed for Candlestick Point, and the existing stadium would remain.

Alternative 2 – No Bridge

The land use program for Alternative 2 would be the same as the Project. However, Alternative 2 would modify the circulation plan proposed under the CP-HPS Phase II Development Plan, and would not include construction of the Yosemite Slough bridge.

Under Alternative 2, since the Yosemite Slough bridge would not be constructed, motorized and non-motorized traffic would be required to circumnavigate the slough. Between the intersection of Carroll Avenue/Arelious Walker Drive and Crisp Avenue within Hunters Point Shipyard, the proposed BRT line would be routed on Carroll Avenue between Arelious Walker Drive and Hawes Street, on Hawes Street between Carroll Avenue and Armstrong Avenue (currently unimproved), and on Armstrong Avenue between Hawes Street and the Navy Rail right-of-way, along the Navy rail right-of-way between Armstrong Avenue and Shafter Avenue, along Shafter Avenue between the Navy rail right-of-way and Arelious Walker Drive, and on Arelious Walker Drive between Shafter Avenue and Crisp Avenue (currently unimproved). **Figure 12** illustrates the proposed route.

- On Carroll Avenue the BRT line would operate within an exclusive BRT lane – one transit-only lane and two mixed-flow travel lanes would be provided in each direction.
- Hawes Street between Carroll Avenue and Armstrong Avenue, and Arelious Walker Drive between Shafter Avenue and Crisp Avenue are currently unimproved streets and would be built out to accommodate one transit-only travel lane in each direction.
- The Navy rail right-of-way between Armstrong Avenue and Shafter Avenue would be improved to provide one transit-only travel lane in each direction.
- Shafter Avenue between the rail right-of-way and Arelious Walker Drive would be reconfigured to provide four travel lanes, with BRT operating within the center lanes. Providing four travel lanes would require either prohibiting parking on one side of the street or narrowing sidewalks by four feet (from 15 feet wide to 11 feet wide) on both sides of the street.

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[6] In June 1997, San Francisco voters adopted two measures – proposition D and Proposition F – providing for the development of a new state-of-the-art stadium for the San Francisco 49ers football team and an entertainment/retail shopping center at Candlestick Point. Proposition F amended the General Plan, Planning Code, and Zoning Map, and established the Candlestick Point Special Use District to accommodate the development of a stadium suitable for professional football and a shopping and entertainment center with open space and related parking facilities, as principal uses, and other conditional uses, such as

SOURCE: SFMTA

FIGURE 12: BRT ROUTE FOR NO BRIDGE PROJECT CONDITIONS

Alternative 3 – 49ers at Candlestick

Alternative 3 assumes that the 49ers would continue to utilize the existing Candlestick Park stadium. The only new development that would occur at Candlestick Point would be replacement of Alice Griffith housing complex (256 units), and construction of 954 additional housing units. Within Hunters Point Shipyard, the land use program would be similar to the Project, however, the stadium would not be constructed, and instead, 1,350 residential units more than proposed as part of the Project would be developed. The Candlestick Park stadium would remain at its existing site.

Alternative 3 includes the construction of a bridge over Yosemite Slough for use by pedestrians, bicycles, and BRT. The bridge would be narrower than the bridge proposed as part of the Project, and would have a 39-foot wide right-of-way to accommodate two 11-foot wide BRT lanes, a sidewalk, and a Class I bicycle path.

Alternative 4 – Lesser Build

Land uses proposed under Alternative 4 would be similar to the Project, however, the proposed floor areas for most uses would be approximately 30 percent smaller at full buildout in comparison to the Project. The floor area for the artists studios, community services, the arena and stadium would remain the same as for the Project. Candlestick Park stadium would be demolished, and a new stadium would not be constructed.

Alternative 4 would not include construction of a bridge over Yosemite Slough. As under Alternative 2, motorized and non-motorized traffic would be required to circumnavigate the slough, and the most direct route between Hunters Point Shipyard and Candlestick Point would be via Ingalls Street. The proposed BRT line would be routed primarily within the Navy rail right-of-way as described under Alternative 2 above, and illustrated in **Figure 12.**

Alternative 5 – No Park Agreement

The land use program for Alternative 5 would be the same as Project Variant 2, which assumes that 1,350 residential units would be shifted from Candlestick Point to Hunters Point Shipyard. Alternative 5 assumes that the existing stadium would be demolished, and that a new stadium would not be constructed. However, Alternative 5 would not involve State land exchange, and therefore would not include construction of a bridge over Yosemite Slough.

Motorized and non-motorized traffic would be required to circumnavigate the slough, and the most direct route between Hunters Point Shipyard and Candlestick Point would be via Ingalls Street. The proposed BRT line would be routed primarily within the Navy rail right-of-way as described under Alternative 2 above, and illustrated in **Figure 12.**

Chapter 3
PROJECT SETTING

This chapter describes the facilities and systems that currently comprise the local and regional transportation network serving the Project. These facilities and systems include a network of local street, ramps and freeways; local and regional bus and rail transit lines; parking; pedestrian and bicycle facilities; and good movement.

This setting chapter describes: 1) the transportation study area; 2) existing regional and local transportation facilities and services that serve the Project area; 3) existing transportation conditions; and 4) transportation conditions following a football game at the existing stadium.

3.1 TRANSPORTATION STUDY AREA

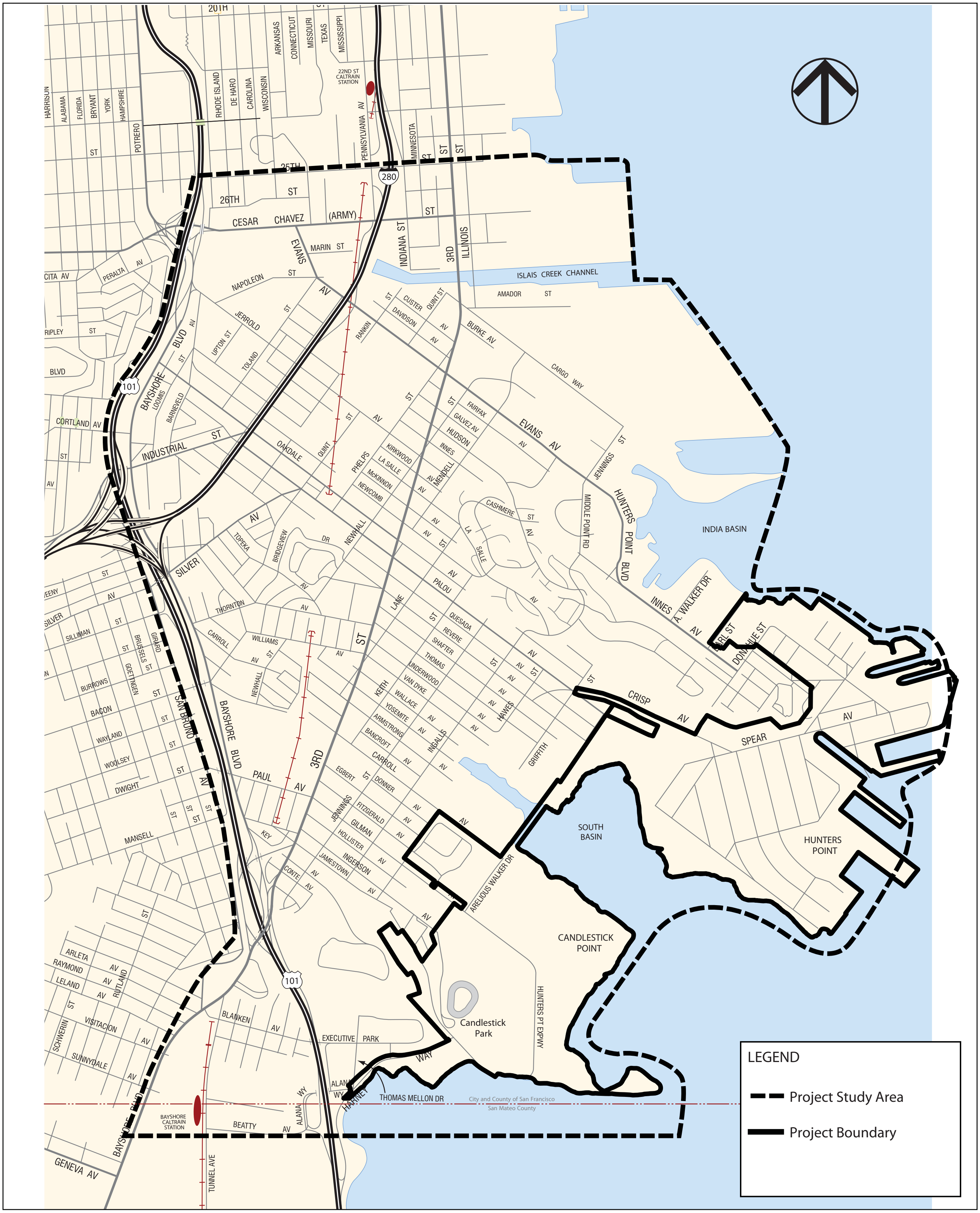
The transportation study area includes all aspects of the transportation network that may be measurably affected by Project traffic. The transportation study area is defined by travel corridors and by facilities such as bus stops/transit stations. It includes the freeway segments, freeway ramps and existing and proposed street intersections that residents and visitors would use in traveling to and from the Project. **Figure 13** presents the transportation study area.

A total of 59 existing intersections (including five intersections within the City of Brisbane), 11 freeway on- and off-ramps, and five freeway segments within the study area were identified as key locations that are likely to be impacted by the Project, and were selected for detailed study of the Project impacts. The study intersections include all major intersections along Third Street, Bayshore Boulevard, and access routes to and from U.S. 101 (including the off-ramp and local street junctions). Intersections further away were not analyzed as part of the study, as Project traffic remaining on local streets would be dispersed and consequently, the Project contribution would be less than at the study intersections. **Figure 14** presents the traffic analysis locations.

The parking analysis focused on two subareas where the stadium game day parking would occur including the on-site and off-site lots, as well as residential streets adjacent in Little Hollywood and Bayview/Candlestick Point.

3.2 ROADWAY NETWORK

This section provides a discussion of the existing roadway network within the study area. Transportation Study Appendix D contains definitions and regulatory requirements for the various San Francisco General Plan (General Plan) roadway classifications.



SOURCE: LCW Consulting

FIGURE 13: PROJECT STUDY AREA

SOURCE: Fehr & Peers

FIGURE 14: TRAFFIC ANALYSIS LOCATIONS

3.2.1 Regional Access

Travel to and from the Project site involves the use of regional transportation facilities, highways and transit services that link San Francisco with other parts of the Bay Area and Northern California. Candlestick Point is accessible by local streets with connections to and from regional freeways and highways in the state system.

U.S. 101 is generally a north/south freeway, connecting San Francisco with the Peninsula and beyond to the south, and Marin County and beyond to the north. Between I-80 and I-280, U.S. 101 is an eight to ten-lane limited-access freeway. Between I-80 and the Golden Gate Bridge, U.S. 101 is a six-lane surface street along Van Ness Avenue, Lombard Street and Doyle Drive.

U.S. 101 has both northbound and southbound on- and off-ramps at Harney Way/Beatty. At Bayshore/Third, there is no northbound on-ramp, and at Cesar Chavez Street, there is no southbound on-ramp. U.S. 101 has a southbound off-ramp at Paul/San Bruno; southbound and northbound on-ramps at Industrial Avenue; and southbound on- and off-ramps and a northbound off-ramp at Silver Avenue.

U.S. 101 is one of the most heavily used corridors in the Bay Area. U.S. 101 and I-280 merge approximately two miles north of Candlestick Point, a common location of congestion during weekday commute periods and pre- and post-game periods. Approximately two miles south of Candlestick Point, U.S. 101 merges with I-380[7] near the San Francisco International Airport.

I-80, which merges with U.S. 101 north of Candlestick Point and south of downtown San Francisco, is generally an east-west freeway, stretching from San Francisco in the west to Sacramento and beyond to the east. The San Francisco-Oakland Bay Bridge connects with U.S. 101 south of downtown San Francisco.

I-280 is generally a north-south freeway, connecting San Francisco with the Peninsula. The freeway provides a direct connection to U.S. 101 and terminates at the surface streets in the South of Market/Mission Bay area. South of the interchange with the U.S. 101 I-280 is currently a six- to eight-lane freeway.

Table 7 presents the U.S. 101 and I-280 ramps serving the study area. Within the study area, ramps are closely spaces, and standard full interchanges are not provided.

[7] I-380 is a short 3.3-mile east-west highway that connects I-280 in San-Bruno with U.S. 101 near the San Francisco International Airport.

Table 7 U.S. 101 and I-280 Ramps in Study Area Existing Conditions				
	Northbound		Southbound	
	On-Ramp	Off-Ramp	On-Ramp	Off-Ramp
U.S. 101				
Harney Way & Alana/Beatty	X	X	X	X
Third/Bayshore/Hestor	X	X	X	X
Mansell Street				X
Silliman Street			X	X
Silver Avenue		X		
Alemany Avenue/Industrial Street	X		X	X
Cesar Chavez/Bayshore	X	X	X	X
I-280				
25th/Indiana/Pennsylvania	X		X	X
Cesar Chavez Street		X		

Source: Fehr & Peers.

3.2.2 Local Roadway Network

This section provides a discussion of the existing local roadway system in the vicinity of the Project site, including the roadway designation, number of travel lanes, and traffic flow directions.

Alana Way is an approximately 1,500-foot two-way roadway segment that connects Beatty Avenue with Harney Way. It serves as the primary connection between Harney Way and U.S. 101 southbound ramps at Alana/Beatty. Alana Way has one travel lane in the eastbound direction towards Harney Way, and two travel lanes in the westbound direction towards Beatty Avenue. On-street parking is not permitted at any time.

Arelious Walker Drive (previously named Fitch Street) is a north-south discontinuous roadway that is divided by the Yosemite Slough and Hunters Point Hill. Arelious Walker Drive runs between Gilman and Carroll Avenues, between Shafter and Palou Avenues, and between Innes and Galvez Avenues. Like other north-south streets in the vicinity, the Arelious Walker Drive alignment has a 64-foot wide right-of-way with room for two 10-foot wide sidewalks (presently un-paved). This street serves as an alternative way to access the northern unpaved privately-owned parking lots used for stadium parking. Arelious Walker Drive between Gilman and Carroll Avenues is part of Bicycle Route #805, and is part of the unimproved on-street Bay Trail.

Bayshore Boulevard is a north-south arterial that generally parallels U.S. 101. Bayshore Boulevard has three travel lanes in each direction, separated by a median. The General Plan designates Bayshore Boulevard as a Major Arterial, part of the MTS Network, and a Transit Preferential Street (other – secondary), and a Neighborhood Commercial Street. South of Arleta Avenue, Bayshore Boulevard is designated as a Transit Preferential Street (other – secondary). Bayshore Boulevard is part of Bicycle Routes #25 and #5. The T-Third light rail line runs on Bayshore Boulevard between Hester Avenue and Sunnydale Avenue.

Beatty Avenue is a two-way east-west roadway between Tunnel Avenue and the U.S. 101 southbound ramps at the intersection of Alana/Beatty. Beatty Avenue has one travel lane in each direction.

Blanken Avenue is a two-way east-west roadway that extends from Bayshore Boulevard through the Little Hollywood area west of Executive Park. The roadway has one lane in each direction with sidewalks and unrestricted parking on both sides of the street. Commercial vehicles weighing more than 6,000 pounds are prohibited from using this roadway as a through route. Blanken Avenue terminates at the intersection of Executive Park Boulevard and Candlestick Road.

Cargo Way is an east-west roadway that extends between Third and Jennings Streets, and serves as the primary access point for the Port of San Francisco's Intermodal Container Terminals. Cargo Way generally contains two travel lanes in each direction. The General Plan identifies Cargo Way as a Secondary Arterial, and as a street with significant truck traffic. Cargo Way is part of the unimproved on-street Bay Trail.

Carroll Avenue is an east-west roadway between Third Street and Arelious Walker Drive. Carroll Avenue has one eastbound lane and two westbound lanes. Carroll Avenue has a right-of-way width of 80 feet. It has discontinuous sidewalks, and, due to the rail tracks there is no sidewalk on the south side of Carroll Avenue between Jennings and Third Streets. Between Ingalls and Hawes Streets there are no sidewalks on the north side of the street, and between Hawes and Griffith Streets there are no sidewalks on either side of the street. Sidewalk accommodations to the east of Ingalls Street are generally discontinuous or frequently obstructed by parked vehicles. On-street parking is permitted west of Ingalls Street. The General Plan identifies Carroll Avenue as a street with significant truck traffic. Carroll Avenue is a part of Bicycle Route #805. Between Arelious Walker Drive and Ingalls Street, Carroll Avenue is currently part of the unimproved on-street Bay Trail.

Cesar Chavez Street is a major east-west arterial between Douglass Street to the west and the Port of San Francisco North Container Terminal, east of Third Street. In the vicinity of the Project, Cesar Chavez Street generally has two to three travel lanes in each direction, with a center median. West of Guerrero Street, Cesar Chavez Street has one lane in each direction. In the General Plan, Cesar Chavez Street is identified as a Major Arterial in the CMP Network from Guerrero Street to Third Street, a Secondary Arterial east of Third Street, and part of the MTS

Network. It is identified as a Route with Significant Truck Traffic east of U.S. 101. Cesar Chavez Street is part of the Bicycle Route #60.

Crisp Avenue is an east-west roadway that extends from the intersection of Griffith/Palou to Spear Avenue within the Shipyard. Public vehicle access is currently not permitted, with the exception of emergency vehicles, and the roadway is currently gated (Crisp south gate) at the intersection of Griffith/Palou. Crisp Avenue served as the primary truck and rail access into the Shipyard until 1971. Crisp Avenue would be reopened as part of the Project.

Evans Avenue is an east-west arterial, with two travel lanes in each direction. Evans Avenue extends between Cesar Chavez Street and Jennings Street (where it becomes Hunters Point Boulevard). The General Plan identifies Evans Avenue between Cesar Chavez Street and Third Street as a Major Arterial in the CMP Network, and part of the MTS Network. Evans Avenue between Third Street and Jennings Street is identified as a Secondary Arterial, and part of the MTS Network. The General Plan also identifies Evans Avenue as a street with significant truck traffic. Evans Avenue is part of Bicycle Route #68, and between Third and Jennings Streets a bicycle lane is provided in each direction.

Geneva Avenue is a major east-west roadway that connects Bayshore Boulevard in Brisbane and Daly City to Highway 1 and I-280 in San Francisco. Geneva Avenue generally has two travel lanes in each direction. The General Plan designates Geneva Avenue as a major arterial, and as a Transit Preferential Street. It is also part of the congestion Management Program Network. Geneva Avenue is part of Bicycle Route #90. The Geneva Avenue Corridor is part of an ongoing Transit Preferential Street study by SFMTA to identify short- and mid-term improvements to increase transit reliability, performance and service.

Gilman Avenue is an east-west street between Third Street and Giants Drive/Hunters Point Expressway. Gilman Avenue has one eastbound travel lane and two westbound lanes, and on-street parking is generally permitted. As with Jamestown and Ingerson Avenues, commercial vehicles weighing more than 6,000 pounds are prohibited from Gilman Avenue between Third and Fitch Streets, except for local service.

Griffith Street is a north-south discontinuous roadway that is divided by Yosemite Slough. On the southern side of the slough, Griffith Street runs between Gilman Avenue and Cameron Way. North of the Slough, Griffith Street extends from Navy Road south to Thomas Avenue. Between Thomas Avenue and the Slough, Griffith Street is an unimproved dirt road. The General Plan identifies Griffith Street between Thomas Avenue and Crisp Avenue as a street with significant truck traffic.

Harney Way is the primary southern access road to Candlestick Point. Harney Way provides a direct connection between U.S. 101 and Jamestown Avenue. Vehicles destined to and from U.S.

101 northbound use the Harney Way ramps, while vehicles destined to and from U.S. 101 southbound use the Alana/Beatty ramp on the west side of U.S. 101 (via Alana Way). Between Alana Way and Jamestown Avenue, Harney Way has two travel lanes in each direction. On-street parking is not permitted at any time, and a sidewalk is provided only on the north side. Harney Way is part of Bicycle Route #805.

Hunters Point Boulevard is an arterial that connects Evans Avenue at Jennings Street with Innes Avenue. Hunters Point Boulevard and Innes Avenue serve as the primary access road to the Shipyard. Hunters Point Boulevard has two travel lanes in each direction. The General Plan identifies Hunters Point Boulevard as a Secondary Arterial, and part of the MTS Network. It also identifies Hunters Point Boulevard as a street with significant truck traffic. Hunters Point Boulevard is part of Bicycle Route #68, and contains a bicycle lane in each direction.

Hunters Point Expressway (and the road south of the Harney Way/Jamestown Avenue intersection, called Jamestown Avenue Extension) circles the existing stadium and parking lot, and connects the east end of Jamestown Avenue with the east end of Gilman Avenue. Hunters Point Expressway provides access to the Candlestick Point State Recreational Area east of the Project site. The number of travel lanes on Hunters Point Expressway varies. In general, there are two continuous travel lanes in each direction, with additional lanes providing access between Jamestown and Gilman Avenues and the gates to the on-site parking. On-street parking is not permitted at any time. However, along parts of Jamestown Avenue Extension, on-street parking is permitted but restricted on event days. Hunters Point Expressway is part of Bicycle Route #805.

Illinois Street is a two-way, north-south roadway that generally parallels Third Street north of the Project site, extending from 16^{th} Street over the Islais Creek Channel and merges into Cargo Way at the Amador Street intersection. The roadway primarily has one lane in each direction with sidewalks and on-street parking on both sides of the street

Indiana Street is a north-south roadway between Mariposa and Tulare Streets. Between Cesar Chavez and 25th Streets, Indiana Street operates one-way northbound and provides access to the I-280 northbound on-ramps at 25th Street. Indiana Street generally has on-street parking, both perpendicular and parallel, on both sides of the street. Indiana Street is part of Bicycle Route #907.

Ingalls Street is a north-south roadway between Jamestown Avenue and Innes/Middle Point. Ingalls Street has one travel lane in each direction, and on-street parking and sidewalks on both sides of the street. Ingalls Street has narrow sidewalks and very wide travel lanes between Yosemite Avenue and Thomas Avenue. Prior to the closure of the Hunters Point Shipyard, Ingalls Street was part of the designated truck route between Carroll Avenue and the currently inactive south (Crisp) gate at Palou Avenue. The General Plan identifies Ingalls Street between

Carroll and Thomas Avenues as a street with significant truck traffic. Ingalls Street between Carroll and Yosemite Avenues is currently part of the unimproved on-street Bay Trail.

Ingerson Avenue is an east-west street between Third Street and Giants Drive. Ingerson Avenue has one travel lane in each direction and on-street parking is permitted. Commercial vehicles weighing more than 6,000 pounds are prohibited from traveling on Ingerson Avenue between Third and Arelious Walker Drive, except for local service.

Innes Avenue is an east-west arterial that provides direct access to Hunter Point Shipyard's Innes (north) gate. It contains two travel lanes in each direction. The General Plan identifies Innes Avenue as a Secondary Arterial and part of the MTS Network. It also identifies Innes Avenue as a street with significant truck traffic. Innes Avenue is part of Bicycle Route #68.

Jamestown Avenue is an east-west street between Third Street and Hunters Point Expressway. West of Redondo Street, Jamestown Avenue has one travel lane in each direction. East of Redondo Street to Giants Drive, there is a substantial change in lane width as Jamestown Avenue increases to one lane in the eastbound direction and two lanes in the westbound direction. Commercial vehicles weighing more than 6,000 pounds are prohibited from using Jamestown as a through route. On-street parking is generally permitted on Jamestown Avenue. Jamestown Avenue provides access to Bayview Park and the Candlestick Point Recreation area, and is identified in the General Plan as a Recreational Street.

Oakdale Avenue is an east-west arterial between Bayshore Boulevard and Third Street. East of Third Street, Oakdale Avenue is discontinuous and is generally a residential street. The General Plan identifies Oakdale Avenue between Bayshore Boulevard and Third Street as a Secondary Arterial. Oakdale Avenue between Bayshore Boulevard and Phelps Street is part of Bicycle Route #170, and bicycle lanes are provided on both sides of the street between Selby and Phelps Streets.

Palou Avenue is an east-west roadway between Barneveld Avenue and Griffith Street. It generally has one travel lane in each direction, and parking on both sides of the street. Palou Avenue has truck restrictions (vehicles in excess of 6,000 pounds prohibited) between Selby Street and Griffith Street. Between Phelps and Griffith Streets, Palou Avenue is part of Bicycle Routes #7 and #70.

Pennsylvania Avenue is a two-way north-south roadway between 17th and Cesar Chavez Streets. Pennsylvania Avenue generally has on-street parking on both sides of the street. Pennsylvania Avenue provides on- and off-ramp access to southbound I-280 at Mariposa, 18th, 25th and Cesar Chavez Streets.

Sunnydale Avenue is a two-way east-west roadway that extends west of Bayshore Boulevard to Persia/Mansell. To the east of Bayshore Boulevard, Sunnydale Avenue is an unpaved dead-end roadway. West of Bayshore Boulevard, the roadway has one lane in each direction with sidewalks and on-street parking on both sides.

Third Street is the principal north-south arterial in the southeast part of San Francisco, extending from its interchange with U.S. 101 and Bayshore Boulevard, to its intersection with Market Street. It is the main commercial street in the Bayview Hunters Point district and also serves as a through street and an access way to all of the industrial areas north and east of U.S. 101. In the vicinity of the Project, Third Street has two travel lanes in each direction. On-street parking is generally permitted on one side of the street. The T-Third light rail operates in an exclusive median right-of-way, with the exception of the segment between Kirkwood and Thomas Avenues, where the light rail shares the travel lane with vehicles. In the General Plan, Third Street is designated as a Major arterial, as a Transit Preferential Street (TPS) in the General Plan, and as a route with significant truck traffic (between the segment between Jerrold Avenue and Fourth Street).

Thomas Avenue is an east-west roadway between Third and Griffith Streets. West of Ingalls Street, Thomas Avenue is a residential street, while east of Ingalls Street, there is a mix of land uses, including residential and light industrial uses. The General Plan identifies Thomas Avenue between Ingalls and Griffith Streets as a street with significant truck traffic.

Tunnel Avenue is a two-way north-south roadway that extends south of Bayshore Boulevard and merges into Bayshore Boulevard at Old County Road. The roadway has one lane in each direction with sidewalks and unrestricted on-street parking on both sides of the street. Tunnel Avenue provides access to Bayshore Caltrain Station and to the U.S. 101 ramps at Alana/Betty. Tunnel Avenue is part of Bicycle Route #905.

Underwood Avenue is an east-west roadway between Third Street and Hawes Street. Underwood Avenue is primarily a residential street between Third and Jennings Streets, and between Jennings and Ingalls Streets there is a mix of residential and light industrial land uses. Between Ingalls Street and Hawes Streets, Underwood Avenue is an unimproved street without paving or gutters, with light/medium industrial land uses.

25th Street is a two-way east-west roadway that runs two blocks north of Cesar Chavez Street between Michigan Street to the east and Grand View Avenue, near Market Street, to the west. It is discontinuous across U.S. 101. 25th Street has one travel lane in each direction, with parking on both sides of the street.

Truck Restrictions

The *San Francisco Transportation Code* Section 501 restricts vehicles with a gross weight of more than 6,000 pounds, or vehicles with a gross weight of more than 18,000 pounds, of operating on identified streets. Within the study area, this regulation was intended to discourage through truck traffic from using Third Street and local residential streets to bypass congestion on the parallel freeways, and to reduce the potential for conflicts between truck traffic and non-industrial land uses. **Figure 15** presents the streets within the study area that have truck restrictions.

San Francisco Congestion Management Program

The San Francisco Congestion Management Program (CMP) has identified U.S. 101 and I-280 as part of the CMP roadway network, with a Level of Service (LOS)[8] standard of E. Of the freeway analysis segments on U.S. 101 and I-280, only U.S. 101 northbound, between the county line and I-280 was identified operating at LOS F during the PM peak hour. The 2007 Level of Service Monitoring Report for the CMP roadway network indicates that during the AM peak period, U.S. 101 northbound between Cortland Street and the I-80 merge, as well as I-280 between Weldon Street and the 6th/Brannan off-ramp operate at LOS E conditions. All other CMP roadway segments within the study area operate at LOS D or better. See Transportation Study Appendix D.

3.3 TRAFFIC OPERATING CONDITIONS

Existing traffic operating conditions were determined for key freeway segments, ramps, and intersections in the study area. Operating conditions were determined using existing intersection and roadway traffic count data collected in November and December 2007, as well as June 2009, and recent freeway and ramp volumes obtained from Caltrans. Table E-1 in Transportation Study Appendix E lists the intersection and date of traffic count.

Analysis of existing conditions on regional facilities and at local intersections were analyzed for the weekday AM (8:00 to 9:00 a.m.) and PM (5:00 to 6:00 p.m.) peak hours, and for Sunday (no football game) PM peak hour (4:00 to 5:00 p.m.) conditions. The weekday AM and PM peak hours consider the current morning and evening commute periods. The Sunday PM peak hour coincides with the time that afternoon football games typically end, and the majority of the spectators depart the stadium. **Figure 14** presents the study area analysis locations.

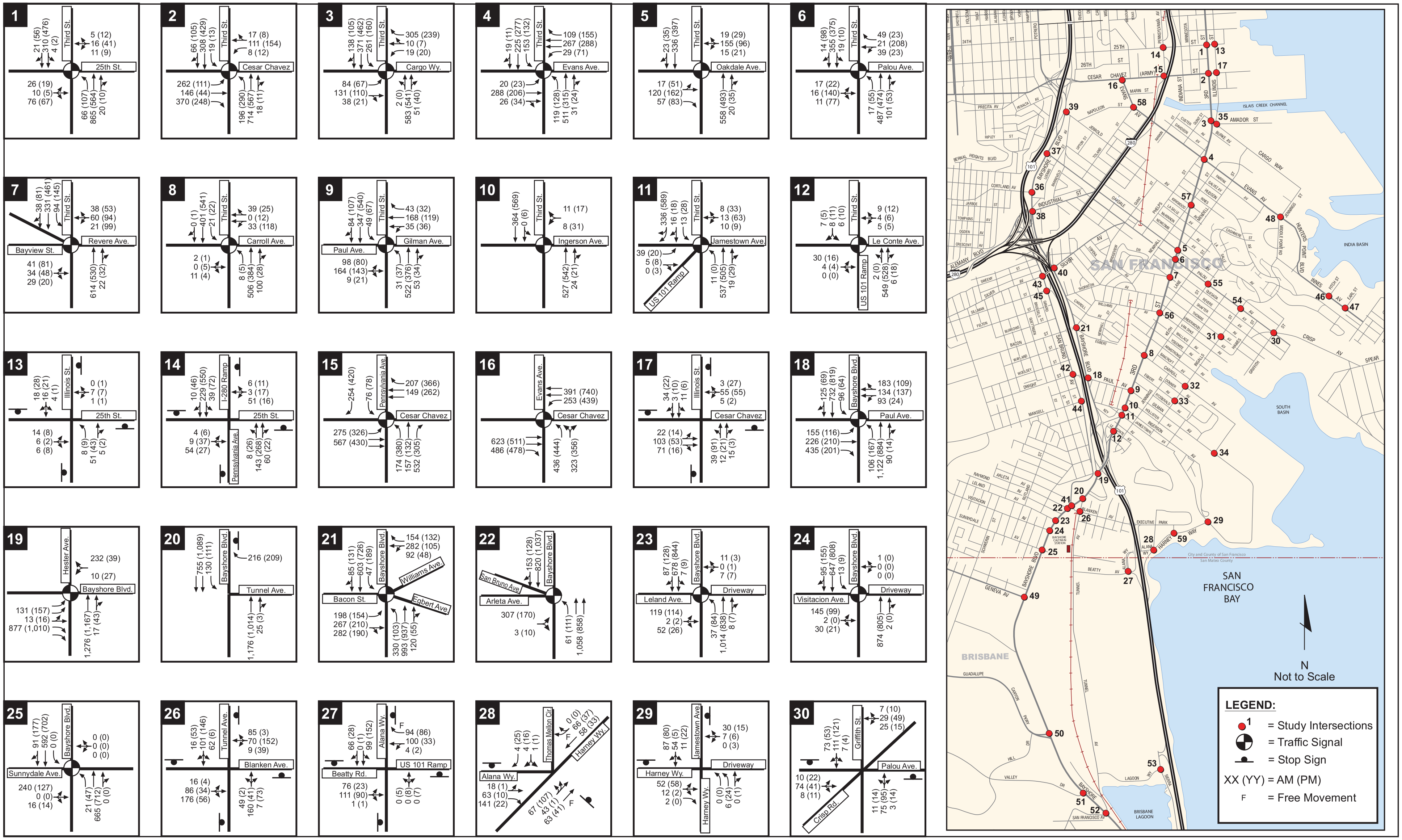
3.3.1 Intersection Analysis

Existing intersection operating conditions were evaluated for 59 intersections in the study area that could be affected by the Project. Of the 59 study intersections, 42 are signalized and 17 are unsignalized. Existing traffic volumes at the 59 study intersection are presented on **Figure 16A** and **Figure 16B** for the weekday AM and PM peak hours, and on **Figure 16C** and **Figure 16D** for the Sunday PM peak hour (no football game conditions). Transportation Study Appendix E contains intersection turning movement volume summaries.

[8] Level of Service (LOS) is a measure of effectiveness used to determine the quality of service of transportation infrastructure.

SOURCE: SFMTA

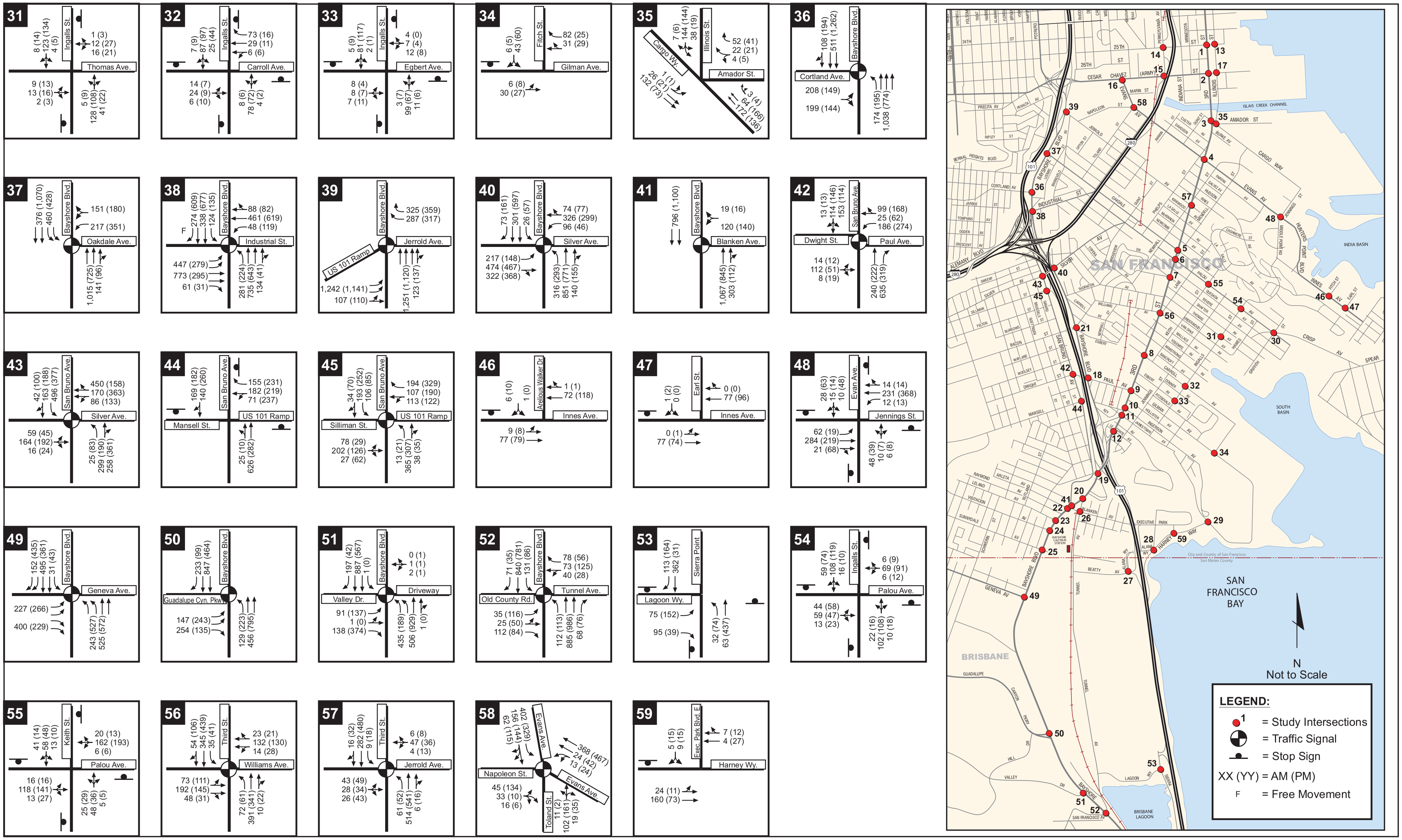
FIGURE 15: EXISTING TRUCK RESTRICTIONS IN STUDY AREA



CP-HPS Phase II Development Plan Transportation Study

EXISTING WEEKDAY
PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS

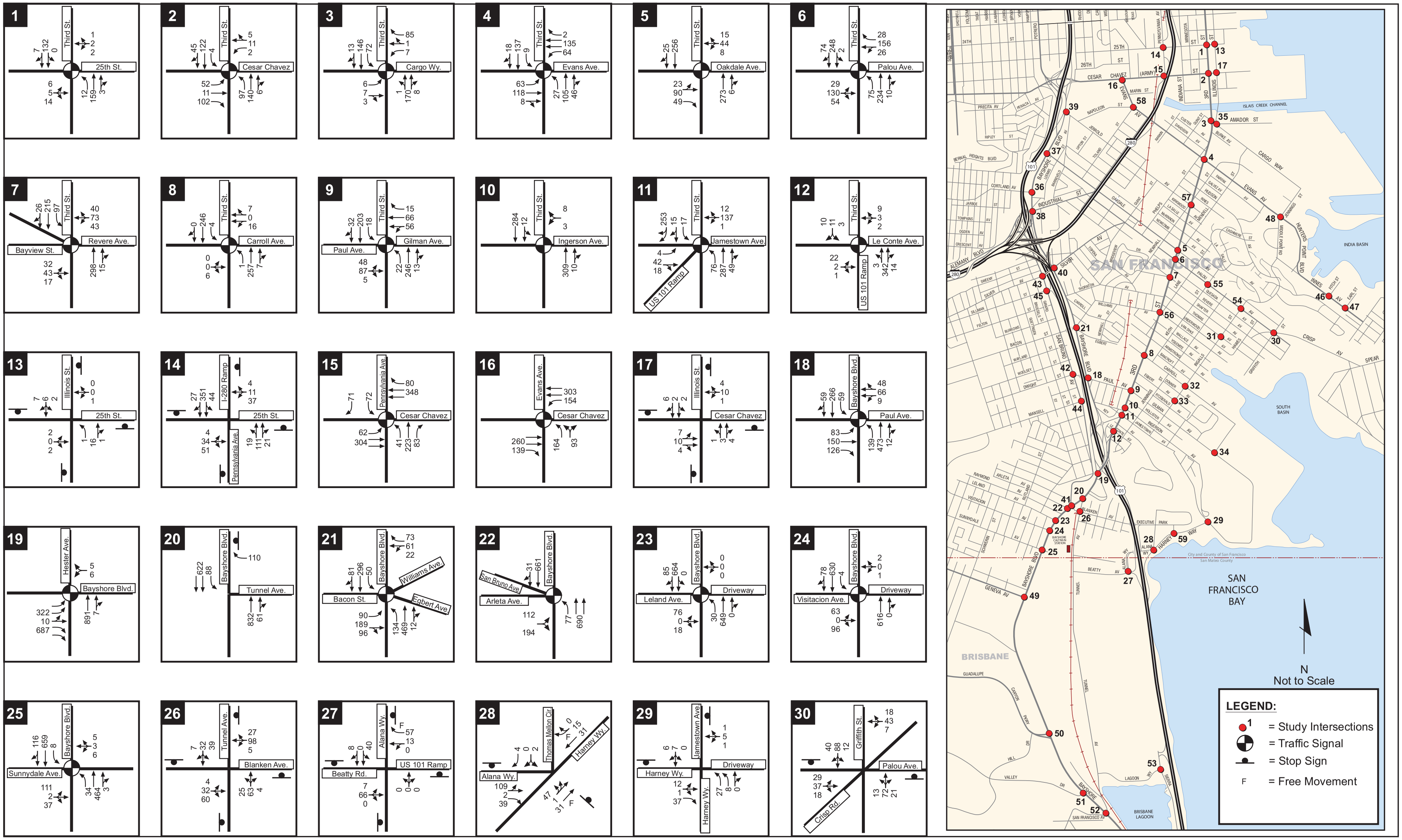
FIGURE 16A



CP-HPS Phase II Development Plan Transportation Study

EXISTING WEEKDAY PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 16B



CP-HPS Phase II Development Plan Transportation Study

EXISTING SUNDAY PM PEAK HOUR (NO FOOTBALL GAME) TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 16C

FEHR & PEERS
TRANSPORTATION CONSULTANTS

June 2009
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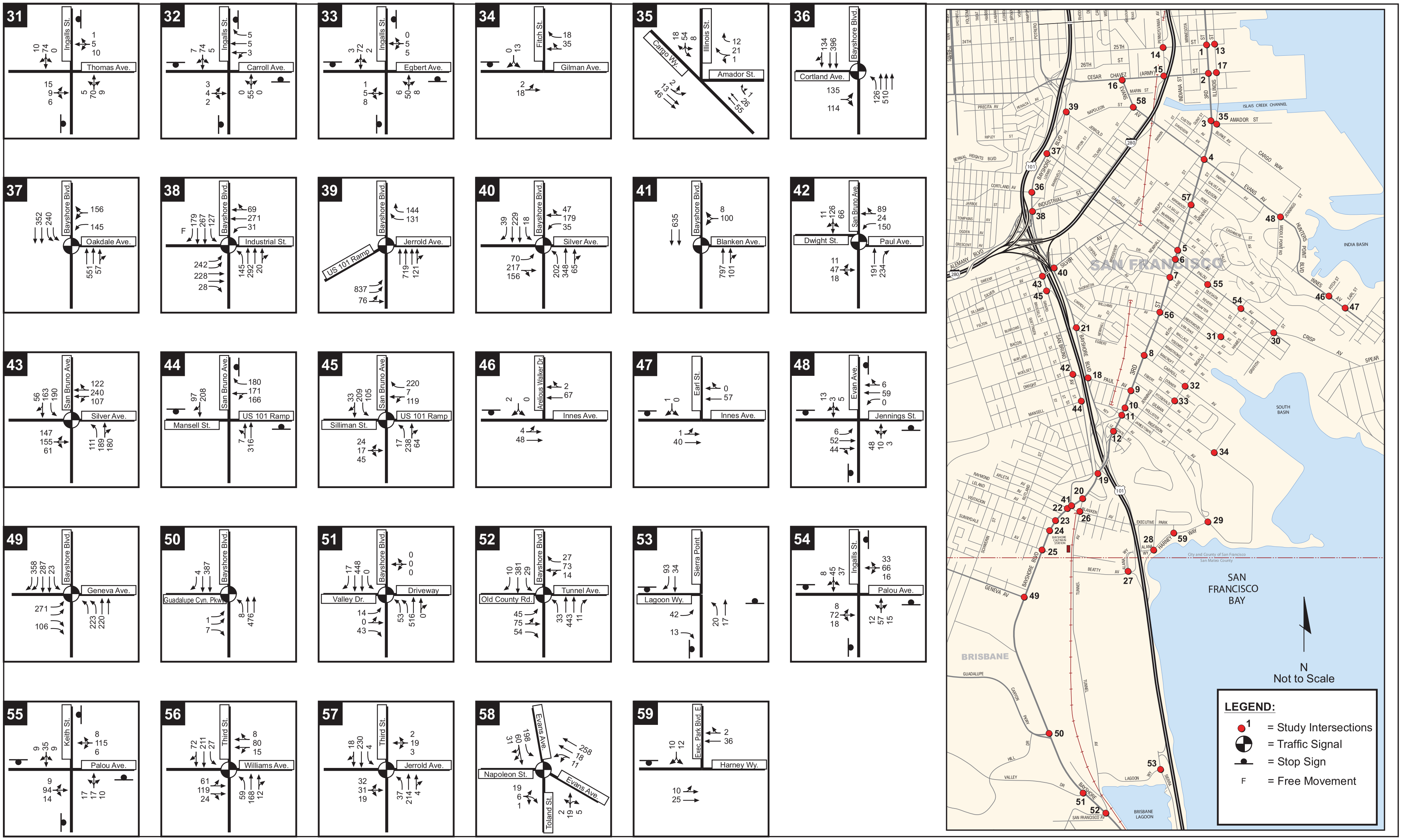


CP-HPS Phase II Development Plan Transportation Study

EXISTING SUNDAY PM PEAK HOUR (NO FOOTBALL GAME) TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 16D

The operating characteristics of signalized and unsignalized intersections are described by the concept of Level of Service ("LOS"). LOS is a qualitative description of an intersection's performance based on the average delay per vehicle. Intersection levels of service range from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays. LOS A through D are considered excellent to satisfactory service levels, LOS E is undesirable, and LOS F conditions are unacceptable. **Table 8** presents the level of service definitions for signalized and unsignalized intersections.

Table 8
LOS Definitions for Signalized and Unsignalized Intersections

Control/ LOS	Description of Operations	Average Control Delay (seconds per vehicle)
Signalized		
A	Insignificant Delays: No approach phase is fully used and no vehicle waits longer than one red indication.	≤ 10
B	Minimal Delays: An occasional approach phase is fully used. Drivers begin to feel restricted.	> 10.0 and ≤ 20.0
C	Acceptable Delays: Major approach phase may become fully used. Most drivers feel somewhat restricted.	> 20.0 and ≤ 35.0
D	Tolerable Delays: Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly without excessive delays.	> 35.0 and ≤ 55.0
E	Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long queues form upstream.	> 55 and ≤ 80
F	Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.	> 80.0
Unsignalized		
A	No delay for STOP-controlled approach.	≤ 10.0
B	Operations with minor delays.	> 10.0 and ≤ 15.0
C	Operations with moderate delays.	> 15 and ≤ 25.0
D	Operations with some delays.	> 25.0 and ≤ 35.0
E	Operations with high delays and long queues.	> 35.0 and ≤ 50.0
F	Operations with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50.0

Source: Highway Capacity Manual (HCM 2000), Transportation Research Board, 2000.

The study intersections were evaluated using the *Highway Capacity Manual 2000* methodology ("*HCM*").[9] For signalized intersections, this methodology determines the capacity for each lane group approaching the intersection. The LOS is then based on average delay per vehicle (in seconds per vehicle) for the various movements within the intersection. A combined weighted

[9] As part of the *HCM* methodology, adjustments are typically made to the capacity of each intersection to account for various factors that reduce the ability of the streets to accommodate vehicles (such as the downtown nature of the study area, number of pedestrians, vehicle type, lane widths and queues). These adjustments are performed to ensure that the LOS analysis results reflect the operating conditions that are observed in the field. See Appendix D for adjustments made at study intersections.

average delay and LOS is presented for the intersection. In San Francisco, LOS E and F are considered unacceptable operating conditions for signalized intersections. For unsignalized intersections, average delay and LOS operating conditions are calculated by approach (e.g., northbound) and movement (e.g., northbound left-turn), for those movements that are subject to delay. For the purpose of this analysis, the operating conditions (LOS and delay) for unsignalized intersections are presented for the worst approach (i.e., the approach with the highest average delay per vehicle) for side-street STOP-sign controlled intersections, and average intersection delay is presented for all-way STOP controlled intersections. LOS calculation sheets are included in Transportation Study Appendix F.

Table 9 presents the results of the intersection LOS analysis for the existing weekday PM peak hour conditions.

Table 9
Intersection LOS
Existing Conditions

Intersection	Control	Weekday AM		Weekday PM		Sunday PM	
		Delay	LOS	Delay [1]	LOS	Delay	LOS
1. Third St/25th St	Signal	14	B	16	B	13	B
2. Third St/Cesar Chavez St	Signal	36	D	31	C	23	C
3. Third St/Cargo Way	Signal	23	C	20	B	17	B
4. Third St/Evans Ave	Signal	35	C	34	C	32	C
5. Third St/Oakdale Ave	Signal	17	B	19	B	15	B
6. Third St/Palou Ave	Signal	15	B	30	C	29	C
7. Third St/Revere Ave	Signal	19	B	31	C	22	C
8. Third St/Carroll Ave	Signal	12	B	14	B	9	A
9. Third St/Paul Ave	Signal	27	C	24	C	21	C
10. Third St/Ingerson Ave	Signal	5	A	5	A	3	A
11. Third St/Jamestown Ave	Signal	13	B	14	B	21	C
12. Third/Le Conte/US 101 nb off	Signal	11	B	11	B	12	B
13. 25th St/Illinois St	AWSC	7	A	7	A	7	A
14. 25th St/Pennsylvania Ave	AWSC	9	A	12	B	10	A
15. Cesar Chavez/Penns/I-280	Signal	**78**	**E**	39	D	28	C
16. Cesar Chavez St/Evans Ave	Signal	21	C	21	C	15	B
17. Cesar Chavez St/Illinois St	Signal	13	B	19	B	14	B
18. Bayshore Blvd/Paul Ave	Signal	21	C	17	B	12	B
19. Bayshore/Hester/US 101 sb off	Signal	28	C	13	B	14	B
20. Bayshore Blvd/Tunnel Ave	Signal	19	B	16	B	8	A

Table 9 (continued)
Intersection LOS
Existing Conditions

Intersection	Control	Weekday AM		Weekday PM		Sunday PM	
		Delay	LOS	Delay [1]	LOS	Delay	LOS
21. Bayshore Blvd/Bacon St	Signal	**76**	**E**	22	C	12	B
22. Bayshore Blvd/Arleta St	Signal	25	C	25	C	24	C
23. Bayshore Blvd/Leland Ave	Signal	21	C	22	C	18	B
24. Bayshore Blvd/Visitacion Ave	Signal	17	B	15	B	15	B
25. Bayshore Blvd/Sunnydale Ave	Signal	20	C	19	B	19	B
26. Tunnel Ave/Blanken	Signal	11	B	9	A	8	A
27. Alana Way/Beatty Ave	SSSC	10	A	9	A	8	A
28. Alana Way/Harney Way/T.Mellon	SSSC	8	A	8	A	9	A
29. Harney Way/Jamestown Ave	SSSC	8	A	8	A	7	A
30. Crisp Ave/Palou Ave	SSSC	11.4(nb)	B	11.6(nb	B	11.1(sb	B
31. Ingalls St/Thomas Ave	SSSC	11.3(wb	B	11.5(w	B	9.9(wb)	A
32. Ingalls St/Carroll Ave	SSSC	8	A	8	A	7	A
33. Ingalls St/Egbert Ave	AWSC	8	A	8	A	7	A
34. A.Walker/Gilman Ave	SSSC	9.1(sb)	A	9.2(sb)	A	8.9(sb)	A
35. Amador St/Cargo Way	Signal	28	C	24	C	28	C
36. Bayshore Blvd/Cortland Ave	Signal	19	B	25	C	17	B
37. Bayshore Blvd/Oakdale Ave	Signal	30	C	26	C	24	C
38. Bayshore/Alemany/Industrial	Signal	44	D	**58**	**E**	35	C
39.Bayshore/US 101 nb off to Cesar	Signal	43	D	48	D	25	C
40. Bayshore Blvd/Silver Ave	Signal	50	D	50	D	15	B
41. Bayshore Blvd/Blanken Ave	Signal	12	B	11	B	9	A
42. San Bruno Ave/Paul Ave	Signal	20	B	20	B	16	B
43. San Bruno Ave/Silver Ave	Signal	**75**	**E**	46	D	41	D
44. San Bruno/Mansell/US 101 sb off	AWSC	17	C	33	D	16	C
45. San Bruno/Silliman/US 101 sb off	Signal	24	C	20	B	17	B
46. Innes Ave/A.Walker Drive	SSSC	8.6(sb)	A	8.7(sb)	A	8.5(sb)	A
47. Innes Ave/Earl St	SSSC	8.5(sb)	A	8.6(sb)	A	8.5(sb)	A
48. Evans Ave/Jennings St	Signal	9	A	10	A	8	A
49. Bayshore Blvd/Geneva Ave [3]	Signal	24	C	25	C	20	B
50. Bayshore/Guadalupe Pkwy [3]	Signal	16	B	14	B	10	A

Table 9 (continued) Intersection LOS Existing Conditions							
Intersection	**Control**	**Weekday AM**		**Weekday PM**		**Sunday PM**	
		Delay	**LOS**	**Delay** [1]	**LOS**	**Delay**	**LOS**
51. Bayshore Blvd/Valley Dr [3]	Signal	23	C	16	B	11	B
52. Bayshore Blvd/Old County Rd [3]	Signal	28	C	29	C	26	C
53. Sierra Pt/Lagoon Way [3]	AWSC	12	B	16	C	8	A
54. Ingalls St/Palou Ave	AWSC	9	A	9	A	8	A
55. Keith St/Palou Ave	AWSC	9	A	9	A	8	A
56. Third/Williams/Van Dyke	Signal	22	C	22	C	22	C
57. Third St/Jerrold Ave	Signal	22	C	23	C	21	C
58. Evans/Napoleon/Toland	Signal	37	D	46	D	32	C
59. Harney/Executive Park East	SSSC	9.1(sb)	A	8.9 (sb)	A	8.8 (eb)	A

Notes:
1. Delay presented in seconds per vehicle. Intersections operating at LOS E or LOS F conditions highlighted in bold.
2. Intersection STOP-controlled. Delay and LOS presented for worst approach. Worst approach indicated in ( ).
3. Intersections within Brisbane city limits.
Source: Fehr & Peers.

During the weekday AM and PM, and Sunday PM peak hours, most study intersections currently operate at LOS D or better. During the weekday AM peak hour, the intersections of Cesar Chavez/Pennsylvania/I-280 and San Bruno/Silver operate at LOS E conditions. During the weekday PM peak hour, the intersection of Bayshore/Alemany/Industrial operates at LOS E conditions. The poor operating conditions at intersections operating at LOS E are generally related to high volumes of traffic destined to U.S. 101 and I-280. During Sunday PM peak hour conditions (without a football game), none of the 59 study intersections currently operate at LOS E or LOS F conditions.

3.3.2 Freeway Mainline Analysis

The LOS for a freeway section, weaving section, and on-ramp junction with the freeway is based on vehicle density (passenger cars/lane/mile) and service volume (passenger cars/hour) using the relationships presented in **Table 10**. Service volume is the primary measure of the overall weaving segment. The specific level of service, and thus service volume, is prescribed by the weaving movement predicated on the weaving volume, number of lanes, and length of weave relationship. The value of service volume is determined with the aid of nomographs published in *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, by J Leisch, & Associates, September 1983.

Table 10
LOS Definitions for Freeway Mainline, Weaving and Ramp Junction

LOS	Description of Operations	Maximum Density (Passenger Cars Per Mile Per Lane)		Service Volume (Passenger Cars Per Hour)		
				Freeway Weaving Sections (Lanes)		
		Basic Freeway Sections	Freeway Weaving Segments and Ramp Junctions	2	3	4
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	< 11	< 10	< 750	< 800	< 850
B	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	> 11 to 18	> 11 to 20	>750 to 1,000	>800 to 1,100	>850 to 1,200
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	> 18 to 26	> 20 to 28	>1,000 to 1250	>1,100 to 1,350	>1200 to 1,450
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	> 26 to 35	> 28 to 35	>1,250 to 1550	>1,350 to 1,600	>1,450 to 1,650
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	> 35 to 45	> 35	>1,550 to 1,900	>1,600 to 1,900	>1,650 to 1900
F	Represents a breakdown in flow.	> 45	Demand exceeds capacity	> 1900		

Source: Highway Capacity Manual (HCM) – Chapter 23: Basic Freeway Sections and Chapter 25: Ramps and Ramp Junctions Methodology, Transportation Research Board, 2000, Completion of Procedures for Analysis and Design of Traffic Weaving Sections, Jack E. Leisch & Associates, September 1983.

LOS is a qualitative description of traffic flow based on speed, travel time, delay, and freedom to maneuver. There are six levels, ranging from LOS A as the best operating conditions, to LOS F as the worst. LOS E represents "at-capacity" operation. When volumes exceed capacity, stop-and-go conditions result, and operations are designated as LOS F.

Within dense urban areas such as San Francisco, off-ramp operating conditions are largely controlled by the operations at the off-ramp terminus with the street network. For key off-ramps in the study area, the off-ramp queues during the red signal phase were compared to the storage capacity of the off-ramp. The storage capacity of the off-ramp was estimated by estimating the distance between the freeway diverge gore point[10], and the stop bar for the off-ramp approach to the street intersection. Vehicle queue lengths the off-ramp approaches to signalized intersections were estimated from intersection LOS calculations, by multiplying the 95th percentile vehicle queue of the constrained movement by 25 feet to account for average vehicle lengths and the space between queued vehicles.

Caltrans' policy is to maintain freeway mainline and ramp operations at the LOS C/D threshold based on the *Guide for the Preparation of Traffic Impact Studies* (Caltrans, December 2002). However, Caltrans acknowledges that this may not always be feasible and if an existing facility is operating at less than the appropriate target LOS, the existing service level should be maintained.

Freeway mainline and ramp volumes used in the traffic analysis are summarized and presented in Transportation Study Appendix E. Transportation Study Appendix G contains the level of service calculations. **Table 11** presents the level of service for the freeway mainline and weaving sections. All analysis segments experience LOS E or LOS F conditions during the commute periods – either in the AM or PM peak hours, with the exception of the segment of U.S. 101 southbound between the I-80 westbound merge and Cesar Chavez. The segment of U.S. 101 southbound between Third/Bayshore and Sierra Point experiences LOS E conditions during both the AM and PM peak hours.

[10] A gore point is the triangular area of land where freeways split or merge.

Table 11 Mainline and Weaving Segment LOS Existing Conditions				
Mainline Segment	**Weekday AM (PM)**		**Sunday PM**	
	LOS [1]	**Density** [2] **(pc/mi/ln)**	**LOS**	**Density (pc/mi/ln)**
U.S. 101				
NB - Cesar Chavez to Vermont	**E** (D)	**44.6** (26.8)	C	20.6
NB – Harney Way to Third/Bayshore	D **(E)**	33.8 **(42.3)**	C	22.0
NB – Sierra Point to Harney Way	D (**E**)	33.8 (**42.9**)	C	21.9
SB – I-80 Merge to Cesar Chavez	D (D)	33.4 (33.8)	D	28.8
SB – Third/Bayshore to Alana Way	**E (E)**	**43.0 (36.0)**	C	21.4
SB – Alana Way to Sierra Point	**E (E)**	**42.2 (36.8)**	C	21.2
I-280				
NB – Alemany Off to Alemany On	**E** (C)	**39.1** (23.9)	B	15.6
SB – Alemany On to Alemany Off	C **(F)**	23.9 (>**45**)	D	27.0
Weaving Segment [4]	**LOS**	**Service Volume**[3] **(pc/h)**	**LOS**	**Service Volume (pc/h)**
I-280				
NB – 25th Street to Mariposa Street	**E** (C)	**1,680** (1,350)	**A**	**--**
SB – Mariposa Street to 25th Street	B (**E**)	810 (**1,630**)	A	--

Notes:
1. Segments operating at LOS E or LOS F conditions highlighted in **bold**
2. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
3. For weaving sections service volume is reported as the measure of effectiveness. pc/h = passenger cars per hour
4. Weaving segments with travel speeds greater than 50 mph are out of the realm of weaving analysis and thus are assumed to operate at LOS A conditions.

Source: Fehr and Peers.

3.3.3 Freeway Ramp Junction Analysis

A ramp junction analysis was conducted to determine the operating conditions for ramp volumes merging with the freeway mainline traffic flow. Freeway ramp analyses were conducted at 15 on-ramps. Freeway ramps were evaluated using the *Highway Capacity Manual 2000* methodology for ramp merge and diverge conditions. Service levels at the on- and off-ramps are determined based on density, as calculated using the freeway volumes and the ramp volumes at each study location. Similar to the freeway mainline, the operating characteristics of the ramps are described using the concept of LOS (see **Table 8**).

Table 12 presents the results of the freeway ramp LOS analysis for Existing conditions. During the weekday AM and PM peak hours, all of the ramps currently operate at LOS D or better, with the exception of the U.S. 101 southbound on- and off-ramps at Cesar Chavez, and northbound on-ramps from Cesar Chavez and Industrial. Transportation Study Appendix G contains the LOS calculation summary sheets.

Table 12
Ramp Junction LOS
Existing Condition

Ramp Location	**Weekday AM and PM**		**Sunday PM**	
	LOS [1]	**Density [2] (pc/mi/ln)**	**LOS**	**Density (pc/mi/ln)**
U.S. 101				
NB on from Sierra Point Parkway	C (C)	27.0 (29.7)	B	19.3
NB on from Harney Way[2]	C (D)	20.2 (30.0)	B	19.5
NB on from Bayshore	D (D)	31.2 (28.6)	B	16.8
NB on from Alemany/Industrial	**E** (D)	**36.4** (30.2)	C	23.5
NB on from Bayshore/Cesar Chavez	**F** (B)	**>45** (19.6)	C	26.1
SB off to Bayshore/Cesar Chavez	**F (F)**	**>45 (>45)**	**E**	**37.5**
SB on from Cesar Chavez/Potrero	**F (F)**	**>45 (>45)**	D	30.6
SB on from Alemany/San Bruno	C (C)	24.1 (24.5)	B	17.3
SB on from Third/Bayshore	D (C)	30.0 (26.5)	B	16.5
SB on from Alana Way	D (C)	29.7 (24.2)	B	18.7
SB on from Sierra Point/Lagoon	C (C)	27.7 (26.5)	B	18.3
I-280				
NB off to Cesar Chavez	**F** (D)	**>45** (28.4)	B	19.2
NB on from Indiana/25th	D (C)	33.4 (27.4)	B	18.4
SB off to Pennsylvania/25th	C **(E)**	23.6 **(36.7)**	C	27.0
SB on from Pennsylvania/25th	C **(E)**	22.9 **(38.5)**	C	26.4

Notes:
1. Ramp junctions at LOS E or LOS F conditions highlighted in **bold**
2. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
Source: Fehr and Peers.

Table 13 presents the storage length of the study area off-ramps , as well as the queue length for weekday AM and PM peak hour, and Sunday PM peak hour (no football game) conditions. As indicated in the table, the queues at the off-ramp approach to the signalized intersections are accommodated within the ramp storage capacity.

Table 13
Freeway Diverge Queue Storage Ramp Junction LOS
Existing Conditions

Ramp Location	Storage Length (feet)	Queue (feet)		
		Weekday AM	Weekday PM	Sunday PM
U.S. 101				
Northbound off to Harney Way	2,800	<100	<100	<100
Northbound off to Bayshore/Cesar Chavez	750	400	375	175
Southbound off to San Bruno/Silliman	600	225	225	175
Southbound off to San Bruno/Mansell	650	<100	150	<100
Southbound off to Bayshore/Hester	1,700	225	325	300
Southbound off to Alana Way	1,000	<100	<100	<100
Southbound off to Sierra Point/Lagoon	1,250	<100	<100	<100
I-280				
Northbound off to Cesar Chavez	250	1,500	650	300
Southbound off to Pennsylvania	900	<100	<100	<100

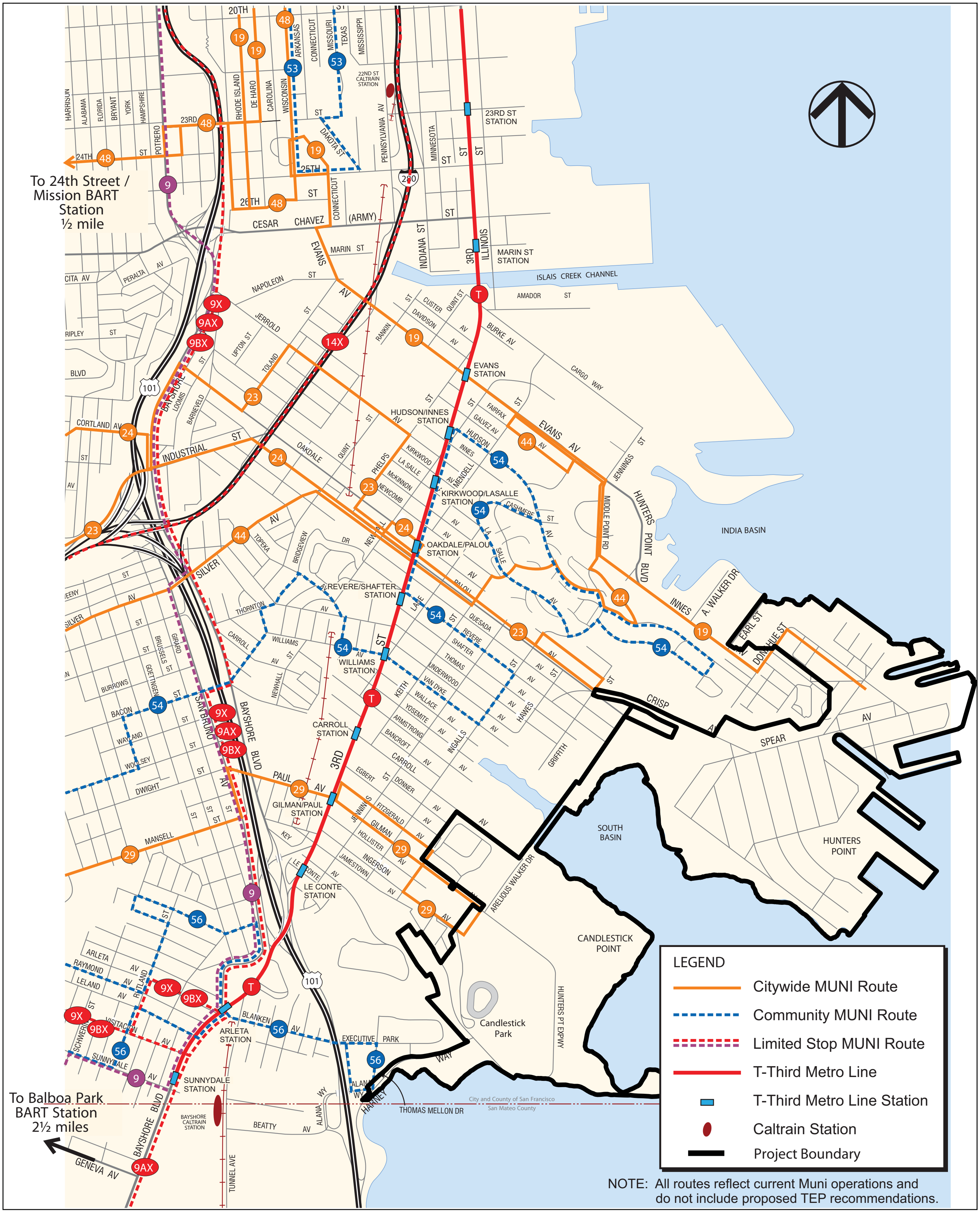
Source: Fehr & Peers.

3.4 TRANSIT NETWORK

This section describes the transit network within the transportation study area. The study area is relatively well-served by public transit, with routes providing crosstown, community, downtown and regional service. Local service within the study area is provided by the San Francisco Municipal Railway (Muni) bus and light rail lines, 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.

3.4.1 Local Muni Service

Figure 17 presents the Muni lines serving the study area. **Table 14** summarizes the frequency of service for the Muni bus and light rail lines serving the study area. Peak period service on most lines are at 8 to 10 minute headways between buses. The 54-Felton has headways between buses of 20 minutes, and the 56-Rutland has headways of 30 minutes. The 44-O-Shaughnessey runs most frequently, with 6 minute headways between buses.



SOURCE: Fehr & Peers; AECOM

FIGURE 17: EXISTING TRANSIT NETWORK

Table 14
Muni Lines Serving Project Study Area

Route	Frequency of Service (average time in minutes)		
	AM Peak Period (7 to 9 AM)	Midday Period (9 AM to 4 PM)	PM Peak Period (4 to 6 PM)
9-San Bruno	7.5	10	7.5
9X-San Bruno Express	10	12	10
9AX-San Bruno "A" Express	10	--	10
9BX-San Bruno "B" Express	15	--	10
19-Polk	10	24	10
23-Monterey	15	20	14
24-Divisadero	8.5	10	10
28L-19th Avenue	10	--	10
29-Sunset	10	15	10
44-O-Shaughnessey	6	15	7.5
48-Quintara-24th Street	12	20	12
54-Felton	20	20	20
56-Rutland	30	30	30
T-Third	8.5	10	8.5

Source: SFMTA

9-San Bruno (MC)[11]: The 9-San Bruno line travels between the Ferry Building in the Financial District to Sunnydale and Santos in the Sunnydale District via San Bruno, Bayshore Boulevard, Potrero Avenue, 11th Street, and Market Street. This route provides service to the Visitacion Valley, Portola, Mission, SoMa, and Downtown districts. It serves all Market Street BART/Muni stations and all Muni Metro stations east of Van Ness Avenue.

19-Polk (MC): The 19-Polk line travels between Polk/Beach Streets in Fisherman's Wharf to the Hunters Point Naval Shipyard via Polk Street, Larkin/Hyde Streets, Seventh/Eighth Streets, Rhode Island/De Haro Streets, Evans Avenue, and Innes Avenue. This route provides service to the Hunters Point, Potrero Hill, SoMa, Civic Center, Tenderloin, Nob Hill, and Russian Hill districts. It also serves the Civic Center BART/Muni station.

23-Monterey (MC): The 23-Monterey line travels between Third & Palou Streets in the Bayview district and Great Highway & Sloat in the Parkside District via Palou, Phelps, Jerrold, Toland, Oakdale, Bayshore, Alemany, Crescent, Mission, Bosworth, Diamond, Monterey, Santa Clara, St. Francis Blvd., and Sloat. This route provides service to the Bernal Heights, Glen Park, Sunnyside, and St. Francis Wood districts and the San Francisco Zoo. It serves the Glen Park BART station.

24-Divisadero (TC): The 24-Divisadero travels between Third & Palou in the Bayview district and Jackson & Fillmore in Pacific Heights via Palou, Industrial, Bayshore, Cortland, Mission,

[11] LRV = light rail vehicle, MC = motor coach, TC = trolley coach.

30th, Noe, 26th, Castro, Divisadero, and Jackson. This route provides service to the Bernal Heights, Noe Valley, Castro, and Western Addition districts.

29-Sunset (MC): The 29-Sunset travels between Gillman and Third Street in the Bayview district, and either California & 25th Street in the Richmond district or Letterman Boulevard in the Presidio via Gillman, Hawes, Fitzgerald, Paul, Bayshore, Mansell, Persia, Mission, Geneva, Plymouth, Grafton, Garfield, Junipero Serra, Holloway, 19th, Winston, Lake Merced, Sunset, Lincoln Way, Crossover, 25th, Lincoln Blvd. Mason, Hallek, Lincoln Blvd., Montgomery, Moraga, Funston, Presido and Letterman. This route provides service to the Portola, Excelsior, Outer Mission, Ingleside, Parkside, Outer Sunset, Outer Richmond, and Seacliff districts. It serves the Balboa Park BART, City College of San Francisco, San Francisco State, Stonestown mall, and Golden Gate Park. This is the only bus providing daily direct service to Candlestick Point.

44-O'Shaughnessey (MC): The 44-O'Shaughnessey travels between Evans & Keith near India Basin and California & Sixth Street in the Inner Richmond via Evans, Middle Point, Young Cir, Keith, Palou, Silver, Alemany, Lyell, Bosworth, O'Shaughnessy, Woodside, Laguna Honda, 7th, Lawton, Ninth, MLK Jr. Drive, Eighth, Cabrillo, Sixth. It serves the Glen Park BART station, Golden Gate Park Main Concourse, and the Portola, Glen Park, Laguna Honda and Inner Sunset districts.

48-Quintara-24th Street (MC): The 48-Quintara-24th Street travels between 20th Street & Third Streets in the Dogpatch/Central Waterfront districts and Great Highway and Quintara Street in the Sunset district via Third, 22nd, Texas, 20th, Wisconsin, 26th, Rhode Island, 23rd, 24th, Douglass, Grandview, Portola, Ulloa, 14th, Santiago, 17th, and Quintara. The route provides service to the Potrero Hill, Mission, Noe Valley, Diamond Heights, Laguna Honda, West Portal, and Parkside districts. It serves the 24th Street BART station and the 22nd Street Caltrain station.

54-Felton (MC): The 54-Felton is a community route that travels between Newhall & Hudson in the Bayview district and the Daly City BART station in Daly City via Hudson, Northridge, Kiska, La Salle, Newhall, Palou, Revere, Ingalls, Van Dyke, Williams, Topeka, Thornton, Vesta, Phelps, Bacon, Holyoke, Woolsey, University, Felton, Moscow, Geneva, Louisburg, Grafton, Plymouth, Sagamore, Alemany, and St. Charles. It serves the Balboa Park and the Daly City BART stations.

56-Rutland (MC short): The 56-Rutland is a community route that travels between Thomas Mellon Dr. & Executive Park Blvd. and Visitacion Valley Middle School via Blanken, Bayshore, Wilde, Rutland, Raymond, and Visitacion Ave. This route serves a small corner of the South Bayshore/Visitacion Valley area, and also provides service to Executive Park.

T-Third (LRV): The T-Third is a light rail vehicle line that operates as a streetcar along the Bayshore/Third corridors, Fourth Street, King Street, and The Embarcadero before entering the Market Street subway at Folsom Street. The route is cross-listed with the K-Ingleside and forms a contiguous route through the Market Street subway, Twin Peaks tunnel, West Portal Ave., and Ocean Avenue to the Balboa Park BART station. The route serves all the Muni and BART stations along Market Street in Downtown in addition to the Fourth Street Caltrain terminal and operates in close proximity to the Bayshore Caltrain Station. The route serves the Visitacion Valley, Bayview, Dogpatch, Mission Bay, SoMa, and Downtown districts.

The T-Third is planned to run along a new alignment north of the Fourth & King station by 2016. The new alignment will take the line as a streetcar for three more blocks on Fourth Street before entering a new subway terminating in Chinatown. There will be three new subway stops: one south of Market Street on Fourth Street, one near Market Street on Stockton Street, and one in Chinatown along Stockton Street. The planned operating scenario for the T-Third is to continue to operate single-car trains between Bayview and Chinatown, at the same frequencies as today (approximately every 8 minutes), and a new two-car short-line would be added to operate between Chinatown and Mariposa Street at approximately 8 minute headways.

Bayshore Intermodal Station Access Study: The Transportation Authority is conducting the Bayshore Intermodal Station Access Study to develop multi-jurisdictional consensus around a vision and conceptual design for new intermodal transit connections and passenger access to the Bayshore Caltrain Station. Multiple planning processes are proceeding to develop projects that would connect new transit services to the Bayshore Station, including an extension of the T-Third Light Rail line from its current nearby terminus, a new Bus Rapid Transit line from Hunters Point Shipyard, and a new local street connection across Bayshore Boulevard, the Caltrain tracks, and U.S. 101 as a Geneva Avenue extension. The Authority is partnering with stakeholder agencies to develop the proposed station connections in a seamless fashion and to promote strong multimodal access to the station. The end result will be a set of conceptual designs for the station and the new connections to serve as a vision that the individual projects will implement as they progress through their planning and preliminary engineering phases.

3.4.2 Regional Providers

BART operates regional rail transit service in the metropolitan Bay Area connecting San Francisco with the East Bay and northern San Mateo County. BART provides service along Market and Mission Streets and near the western I-280 corridor in San Francisco. BART does not provide direct service into the BWP site. Transit connections can be made to the following BART stations from the BWP area: Balboa Park station via the 29-Sunset from Candlestick Point, Glen Park Station via the 23-Monterey and the 44-O'Shaughnessy, and the Embarcadero station via the T-Third light rail route. BART operates at service frequencies of 3 minutes in the peak periods for intra-San Francisco travel.

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. Caltrain currently operates 86 trains each weekday, with a combination of baby bullet, express, and local services. Headways during the peak periods are approximately ten to thirty minutes. The San Francisco Caltrain terminal is located on Fourth Street between King and Townsend Streets to the north of the study area.

The closest active Caltrain station to the study area is the Bayshore station in Brisbane at the San Mateo/San Francisco County border. The station is located off of Tunnel Avenue, just southeast of Bayshore Boulevard. Not all trains stop at the Bayshore Station. During the peak commute periods only one train per hour in each direction stops at the Bayshore Station. There are not direct connections with other transit services. However, Muni and SamTrans can be accessed by walking two to three blocks to bus stops along Bayshore Boulevard.

SamTrans, operated by the San Mateo County Transit District, provides bus service between San Mateo County and San Francisco. SamTrans operates 12 diesel bus lines that serve San Francisco, including nine routes into the downtown area. However, only two routes – the 292 and 397 - serve the Bayview district along Bayshore Boulevard. Only the 292 operates during peak hours. Headways during the peak commuting periods are approximately 15 minutes per line. There are no direct SamTrans services to Candlestick Point, except during football game days. Route 7B operates along Bayshore and stops near the Bayshore Caltrain station on game days.

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. Most transbay service is peak-hour and peak-direction (to San Francisco during the a.m. peak period and from San Francisco during the p.m. peak period), with headways of 15 to 30 minutes per route.

To access Candlestick Point, AC Transit riders first must transfer at the Transbay Terminal to the T-Third line, and then to the 29-Sunset at Paul Avenue.

Golden Gate Transit (bus service) operated by the Golden Gate Bridge, Highway, and Transportation District (GGBHTD), provides bus service between the North Bay (Marin and Sonoma Counties) and San Francisco. Golden Gate Transit operates 18 commute bus routes and two basic routes with service between cities in the North Bay and San Francisco. Most routes serve either the Civic Center (via Van Ness Avenue and Mission Streets) or the Financial District (via Battery and Sansome Streets). Basic bus routes operate at 15 to 90 minute headways, depending on the time and day of the week. Commute and ferry feeder bus routes operate at more frequent intervals in the mornings and evenings. Golden Gate Transit does not provide local service within San Francisco Golden Gate Transit can be accessed from the study area via the T-Third line, with a transfer near the Transbay Terminal.

Golden Gate Transit (ferry service): The GGBHTD also provides ferry service between the North Bay and San Francisco. During the a.m. and p.m. peak periods, ferries operate between Larkspur and San Francisco and between Sausalito and San Francisco. The San Francisco terminal is located at the Ferry Building, on the Embarcadero at Market Street. From the study area, access to the Ferry Building would generally require travel along the T-Third LRT line to the Embarcadero Station.

3.4.3 Transit Ridership and Capacity Utilization

This section presents the ridership and capacity utilization for Muni and regional transit providers for the AM and PM peak hours. Transportation Study Appendix H includes the ridership and capacity assumptions, and capacity utilization calculations.

Muni

Table 15 on the following page presents Muni's ridership and capacity utilization at the maximum load point for the local lines serving the study area for the weekday AM and PM peak hours. For each line, the number peak hour riders inbound and outbound from downtown San Francisco were obtained at the maximum load point (i.e., the point of greatest demand) from Muni monitoring data. The service capacity of each line was estimated by multiplying the passenger capacity standard for transit vehicles by the number of actual bus trips that occurred at the time that the ridership data was collected. The capacity includes seated passengers and an appreciable number of standing passengers per vehicle (the number of standing passengers is between 30 and 80 percent of the seated passengers depending upon the specific transit vehicle configuration). The maximum loads, including both seated and standing passengers, vary by vehicle type and are 45 passengers for a 30-foot bus, 63 passengers for a 40-foot bus, 94 passengers for a 60-foot bus, and 119 passengers for a light rail vehicle. The comparison of the ridership demand to the capacity provided is expressed as a percent utilization of capacity

As indicated in **Table 15**, the maximum load point of two of the ten bus and rail lines occur within the study area. For the 54-Felton bus line, the AM and PM peak hour maximum load points in both the inbound and outbound directions occur at the stops at the intersection of San Bruno Avenue and Bacon Street. For the T-Third light rail line, the maximum load point in the outbound direction during the AM peak hour is at the stop at Third Street and Evans Avenue.

Muni has established a capacity utilization standard of 85 percent. As shown in **Table 15,** the weekday AM and PM capacity utilization for most lines serving the study area do not exceed Muni's standards. However, during the AM peak hour in the inbound direction, the 44-O'Shaughnessey has capacity utilization at the maximum load point exceeding the 85 percent standard, indicating noticeably crowded conditions. Additionally, the 29-Sunset and 48-

Quintara-24th Street are operating at 84 percent of their capacity, nearly exceeding Muni's standard.

Table 15
Muni Ridership and Capacity Utilization at Maximum Load Points
Existing Conditions

Route	Ridership	Capacity Utilization [1]	Destination	Maximum Load Point
AM PEAK HOUR				
Inbound [2]				
9-San Bruno	415	55%	Downtown	Potrero & 23rd
19-Polk	186	49%	Fisherman's Wharf	DeHaro & 20th
23-Monterey	111	44%	Bayview	Diamond & Bosworth
24-Divisadero	260	68%	Pacific Heights	Castro St & 19th St
28L-19th Avenue Limited	110	29%	The Richmond	19th Ave & Quintara St
29-Sunset	321	84%	The Presidio	Balboa Park BART
44-O-Shaughnessey	442	**87%**	The Richmond	Silver Ave & Mission St
48-Quintara-24th St	268	84%	Potrero Hill	24th St & Harrison St
54-Felton	111	58%	Hunters Point	Bacon St & San Bruno Ave
56-Rutland	13	14%	Visitacion Valley	Wilde St & Brussels St
T-Third	336	35%	Sunnydale	4th St & King St
Outbound [2]				
9-San Bruno	218	29%	Visitacion Valley	Potrero Ave & 25th St
19-Polk	201	53%	Hunters Point	Eighth St & Market St
23-Monterey	140	55%	The Zoo	Diamond St & Bosworth St
24-Divisadero	142	37%	Bayview	Castro St & Duboce Ave
28L-19th Avenue Limited	104	27%	Daly City BART	19th Ave & Quintara St
29-Sunset	216	57%	Bayview	Ocean Ave & Geneva Ave
44-O'Shaughnessey	167	33%	Hunters Point	Silver Ave & Gambier St
48-Quintara-24th St	155	49%	Ocean Beach	24th St & Folsom St
54-Felton	100	52%	Daly City BART	Bacon St & San Bruno Ave
56-Rutland	5	6%	Visitacion Valley	Hahn St & Visitacion St
T-Third	512	54%	Castro	Third St & Evans Ave
PM PEAK HOUR				
Inbound				
9-San Bruno	429	57%	Downtown	Potrero Ave & 20th St
19-Polk	223	59%	Fisherman's Wharf	Seventh St & Howard St
23-Monterey	100	39%	Bayview	Diamond & Bosworth Ave
24-Divisadero	144	38%	Pacific Heights	Castro St & 17th St
28L-19th Avenue Limited	150	39%	The Richmond	19th Ave & Quintara St
29-Sunset	124	33%	The Presidio	Persia Ave & Mission St
44-O-Shaughnessey	187	37%	The Richmond	Silver Ave & Merrill St
48-Quintara-24th St	180	57%	Potrero Hill	24th St & Harrison St
54-Felton	59	31%	Hunters Point	Bacon St & San Bruno Ave
56-Rutland	12	13%	Visitacion Valley	San Bruno Ave & Arleta St
T-Third	333	35%	Sunnydale	4th St & King St

Table 15 (continued)
Muni Ridership and Capacity Utilization at Maximum Load Points
Existing Conditions

Outbound				
9-San Bruno	274	36%	Visitacion Valley	Potrero Ave & 22nd St
19-Polk	207	54%	Hunters Point	Eighth St & Market St
23-Monterey	98	39%	The Zoo	Diamond St & Bosworth St
24-Divisadero	215	56%	Bayview	Castro St & 19th St
28L-19th Avenue Limited	105	28%	Daly City BART	19th Ave & Quintara St
29-Sunset	160	42%	Bayview	19th Ave & Holloway Ave
44-O'Shaughnessey	334	66%	Hunters Point	Bosworth St & Diamond St
48-Quintara-24th St	160	50%	Ocean Beach	24th St & Folsom St
54-Felton	59	31%	Daly City BART	San Bruno Ave & Bacon St
56-Rutland	11	12%	Visitacion Valley	Hahn St & Visitacion St
T-Third	369	39%	Castro	Fourth St & King St

Notes:
1. Lines operating above Muni standard capacity utilization are highlighted in **bold.**
2. Route direction follows Muni convention; convention is generally inbound toward or clockwise around downtown with the following exceptions: 23-Monterey, 54-Felton, and T-Third lines inbound towards Bayview.
Source: SFMTA 2007 Trip Activity Reports, Fehr & Peers.

In addition to evaluating Muni operations at the maximum load point for individual routes, and consistent with standard practice in San Francisco, four screenlines for routes serving the downtown financial district were evaluated. This evaluation examined the overall utilization of Muni transit capacity into and out of downtown San Francisco from the northeast, northwest, southeast, and southwest. **Figure 18** presents the location of the downtown screenlines, while existing ridership and capacity utilization at each screenline location is shown in **Table 16**. Overall, each screenline currently operates within Muni's 85 percent utilization standard, with the southwest screenline the most crowded. The southwest screenline includes all subway lines except for the J-Church light rail, the F-Market historic streetcar, and the 6-Parnassus, 7-Haight, 71-Haight-Noriega, and 71L-Haight-Noriega Limited bus lines.

SOURCE: SF Transportation Impact Analysis Guildlines

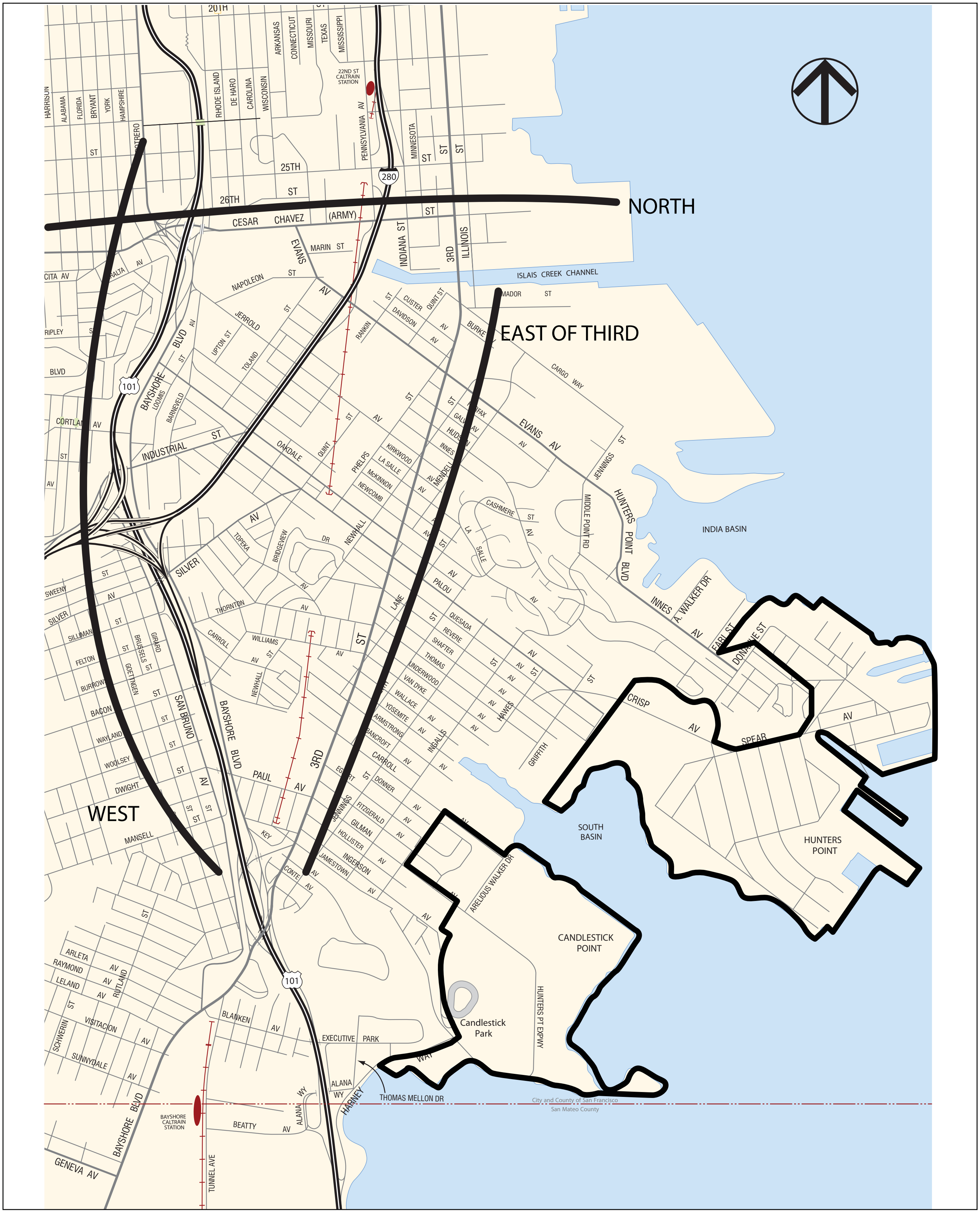
FIGURE 18: MUNI DOWNTOWN SCREENLINES

Table 16
Muni Ridership and Capacity Utilization at Downtown Screenlines
Existing Conditions – Weekday AM and PM Peak Hours

Screenline/Peak Hour	Ridership	Capacity Utilization
AM Peak Hour		
Northeast	1,882	50%
Northwest	7,434	65%
Southeast	4,248	67%
Southwest	6,627	76%
Total All Screenlines	20,191	67%
PM Peak Hour		
Northeast	1,886	52%
Northwest	6,621	65%
Southeast	4,668	66%
Southwest	7,434	77%
Total All Screenlines	20,609	68%

Source: SFMTA, Planning Department, AECOM, 2009.

Two cordons at the perimeter of the study area were also examined to analyze potential impacts of projects on Muni service: the north cordon at Cesar Chavez Street, and the west cordon located west of U.S. 101. In addition, a third cordon within the study area, located east of Third Street was reviewed to assess the degree to which Project transit demand between the Project site and the T-Third Street light rail service would affect localized transit capacity. **Figure 19** presents the cordon locations. **Table 17** presents the weekday AM and PM peak hour inbound and outbound ridership and capacity utilization for the north and west cordons, as well as for each line within the cordons. **Table 18** presents the weekday AM and PM peak hour inbound and outbound ridership and capacity utilization for the internal cordon located east of Third Street.



SOURCE: Fehr & Peers

FIGURE 19: STUDY AREA MUNI ANALYSIS CORDONS

Table 17
Muni Ridership and Capacity Utilization at Study Area Cordons
Existing Conditions

Cordon/Route	Ridership Inbound/Outbound	Capacity Utilization Inbound/Outbound
AM PEAK HOUR		
North (at Cesar Chavez)		
T-Third	329 / 512	35% / 54%
9-San Bruno	415 / 218	55% / 29%
19-Polk	115 / 24	30% / 6%
Subtotal	*859 / 754*	*41% / 36%*
West (West of U.S. 101)		
23-Monterey	111 / 140	44% / 55%
24-Divisadero	250 / 86	66% / 23%
29-Sunset	177 / 63	46% / 17%
44-O'Shaughnessey	442 / 167	87% / 33%
48-Quintara-24th St	268 / 155	84% / 49%
54-Felton	100 / 111	52% / 58%
Subtotal	*1,348 / 722*	*68% / 36%*
PM PEAK HOUR		
North (at Cesar Chavez)		
T-Third	330 / 278	35% / 29%
9-San Bruno	429 / 274	57% / 36%
19-Polk	87 / 74	23% / 19%
Subtotal	*846 / 626*	*41% / 30%*
West (West of U.S. 101)		
23-Monterey	100 / 98	39% / 39%
24-Divisadero	114 / 147	30% / 39%
29-Sunset	71 / 21	19% / 6%
44-O'Shaughnessey	187 / 334	37% / 66%
48-Quintara-24th St	180 / 160	57% / 50%
54-Felton	59 / 59	31% / 31%
Subtotal	711 / 819	36% / 42%

Source: SFMTA 2007 Trip Activity Reports, Fehr & Peers.

Table 18 Muni Ridership and Capacity Utilization at East of Third Street Cordon Existing Conditions		
Cordon/Route	**Ridership Inbound/Outbound**	**Capacity Utilization Inbound/Outbound**
AM PEAK HOUR		
19-Polk	115 / 24	30% / 6%
23-Monterey	38 / 56	15% / 22%
29-Sunset	177 / 63	46% / 17%
44-O'Shaughnessey	256 / 65	50% / 13%
54-Felton	100 / 111	52% / 58%
Subtotal	*686 / 319*	*40% / 19%*
PM PEAK HOUR		
19-Polk	87 / 74	23% / 19%
23-Monterey	58 / 15	23% / 6%
29-Sunset	71 / 21	19% / 6%
44-O'Shaughnessey	114 / 84	22% / 17%
54-Felton	59 / 59	31% / 31%
Subtotal	*389 / 253*	*23% / 15%*

Source: SFMTA 2007 Trip Activity Reports, Fehr & Peers.

Regional Providers

As a means to determine the amount of available space for each regional transit provider, capacity utilization is also used. For all regional transit operators, the capacity is based on the number of seated passengers per vehicle. All of the regional transit operators except BART have a one-hour load factor standard of 100 percent, which would indicate that all seats are full. BART has a peak period load factor standard of 115 percent, which indicates that all seats are full, and an additional 15 percent of the seating capacity are standees (i.e., 1.15 passengers per seat).

Regional transit service was also evaluated at the screenline level. **Figure 20** presents the location of the regional transit screenlines. Screenlines were evaluated for the locations where different regional transit service enters San Francisco, including the North Bay (Golden Gate Transit and Ferries), East Bay (BART, AC Transit, Ferries), and South Bay (BART, Caltrain, SamTrans). The capacity utilization for each of the three regional screenlines is presented in **Table 19**. As shown, regional transit service between San Francisco and the East Bay is currently over its seated capacity; however, since BART can accommodate a substantial number of standees, this excess transit demand is accommodated during peak hours.

SOURCE: SF Transportation Impact Analysis Guildlines

FIGURE 20: REGIONAL TRANSIT SCREENLINES

Table 19
Transit Ridership and Capacity Utilization at Regional Screenlines
Existing Conditions – Weekday AM and PM Peak Hours

Screenline/Peak Hour	Ridership	Capacity Utilization
AM Peak Hour		
East Bay	**20,401**	**108%**
North Bay	2,459	56%
South Bay	13,999	94%
Total All Screenlines	36,859	96%
PM Peak Hour		
East Bay	**20,204**	**102%**
North Bay	2,303	59%
South Bay	12,106	83%
Total All Screenlines	34,613	90%

Source: SFMTA, AECOM, 2009.

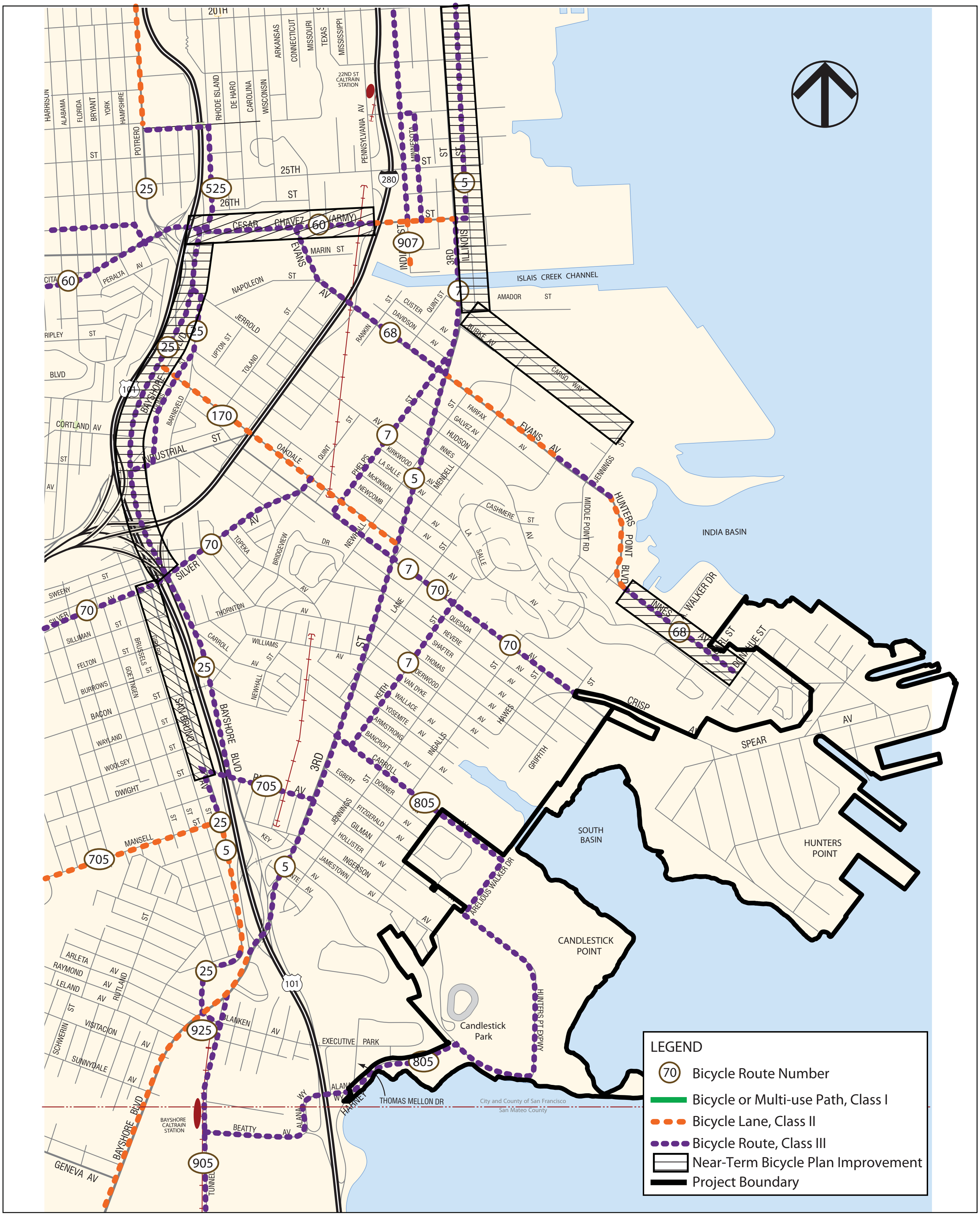
3.5 BICYCLE CONDITIONS

Several existing bicycle facilities are located in the study area. These facilities include municipal routes that are part of the San Francisco Bicycle Network, and regional routes, part of the San Francisco Bay Trail system. Bikeways are typically classified as Class I, Class II, or Class III facilities.[12] Class I bikeways are bike paths with exclusive right-of-way for use by bicyclists or pedestrians. Class II bikeways are bike lanes striped with the paved areas of roadways and established for the preferential use of bicycles, while Class III bikeways are signed bike routes that allow bicycles to share travel lanes with vehicles**.** **Figure 21** presents the bicycle routes within the study area, as identified in the *Official San Francisco Bike Route System*, while **Figure 22** presents the existing Bay Trail facilities.

The *San Francisco Bicycle Plan Draft EIR* was published in November 2008. In June 2009, the Final EIR was approved by the Planning Commission and the Bicycle Plan was approved by the SFMTA Board. In August 2009, the Board of Supervisors affirmed certification the *San Francisco Bicycle Plan Final EIR.* Near-term improvement projects on the existing bicycle network in the study area are noted below, and both near-term and long-term improvements are described in additional detail in Chapter 4 in section 4.3.3.

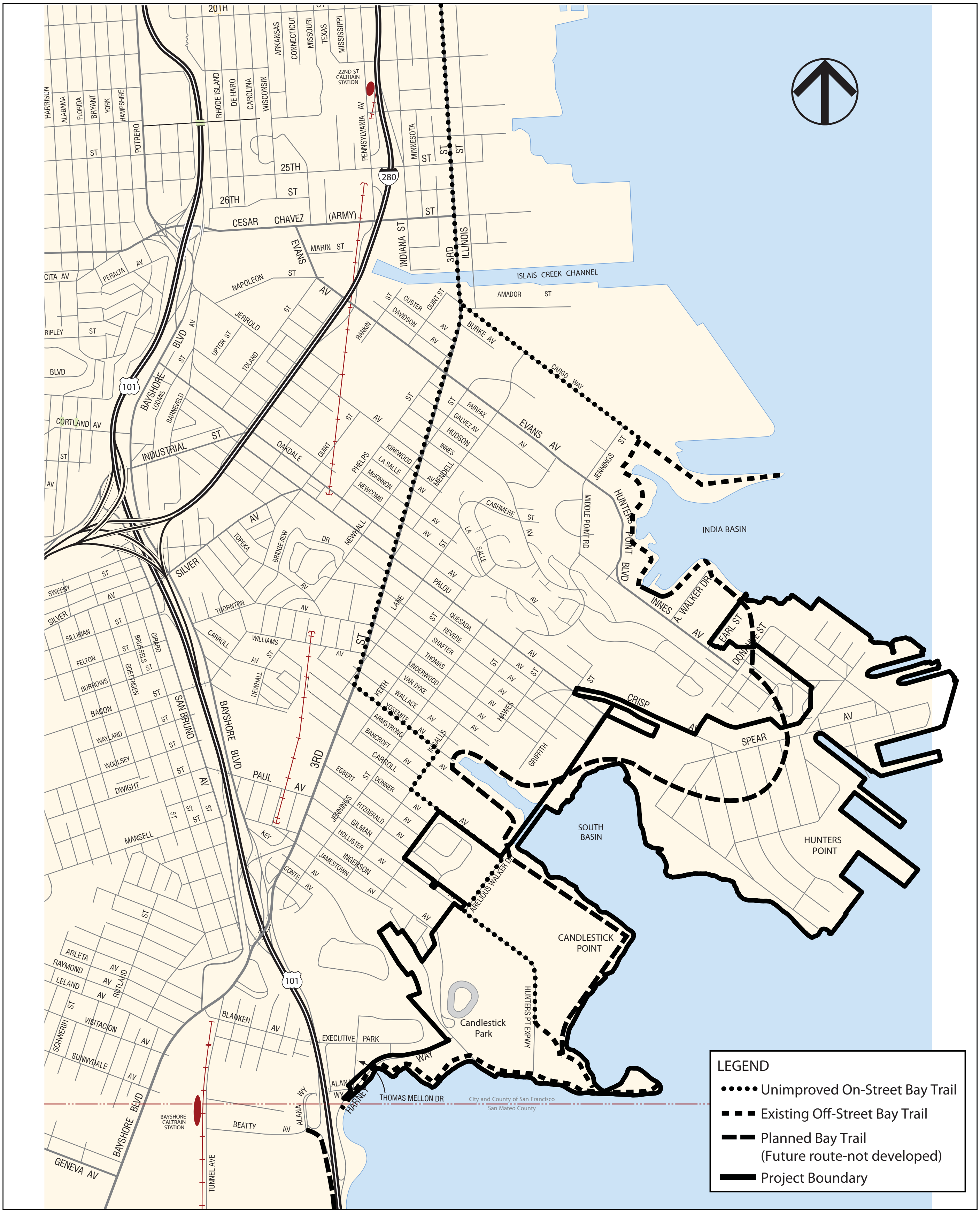
***Route #5**:* Route #5 is the eastern-most north-south bicycle route. This route runs between Visitacion Valley and North Beach, primarily as a Class III facility along Bayshore Boulevard, Third Street, and Illinois Street, and as a Class II facility along The Embarcadero and San Bruno Avenue. Since southbound Third Street does not cross over U.S. 101 to connect with Bayshore Boulevard, southbound Bicycle Route #5 is routed onto Paul Avenue (via Connector Route #705) and San Bruno Avenue (also Bicycle Route #25).

12 Bicycle facilities are defined by the State of California in the California Streets and Highway Code Section, 890.4.



SOURCE: LCW Consulting, SFMTA, San Francisco Bicycle Plan

FIGURE 21: EXISTING SAN FRANCISCO BICYCLE ROUTE NETWORK



SOURCE: LCW Consulting

FIGURE 22: SAN FRANCISCO BAY TRAIL

This split in Bicycle Route #5 is required, since the U.S. 101 undercrossing that provides the connection between southbound Third Street and southbound Bayshore Boulevard would require bicyclists to weave across high-speed traffic. San Francisco Bicycle Plan Project 4-3: Illinois Street Bicycle Lanes, will involve the installation of Class II bicycle lanes in both directions on Illinois Street between 16th Street and Cargo Way. See section 4.3.3.

Route #7: Route #7 is a Class III bike route that runs between Mariposa Street and Carroll Avenue, via Indiana Street, Third Street, Phelps Street, Palou Avenue, and Keith Street. Route #7's southern terminus is at Keith Street and Carroll Avenue at the Bayview Playground and Martin Luther King Pool. It is a Class III facility, however, wider travel lanes that allow bicyclists to ride outside of the path of vehicle travel are provided on sections of Indiana and Phelps Streets, and on Keith Street.

Route #25: Route #25 runs between the southeastern part of San Francisco and the Marina District. Route #25 runs along San Bruno Avenue, Bayshore Boulevard, and Oakdale Avenue in the Bayview Hunters Point area. Within the study area, Route #25 is a Class III facility. North of the study area, Route #25 runs as both a Class II facility (e.g., along Potrero Avenue, Harrison Street, and 11th Street), and as a Class III facility (e.g., 10th Street, Polk Street). San Francisco Bicycle Plan Project 5-4: Bayshore Boulevard Bicycle Lanes, will involve the installation of Class II bicycle lanes in both directions of travel on Bayshore Boulevard between Cesar Chavez Street and Silver Avenue. See section 4.3.3.

Route #60: Route #60 runs between the Great Highway/Vicente and Cesar Chavez Street/Illinois Street. In the study area, it is a Class III facility along Cesar Chavez Street between Bayshore Boulevard and Mississippi Street, and a Class II facility between Mississippi and Illinois Streets. San Francisco Bicycle Plan Project 5-5: Cesar Chavez Bicycle Lanes, will involve the installation of Class II bicycle lanes in both directions on Cesar Chavez Street between Kansas Street (near U.S. 101) and Mississippi Street (near I-280). See section 4.3.3.

Route #68: Route #68 runs from the Innes north gate to Hunters Point Shipyard along Innes Avenue, Hunters Point Boulevard and Evans Avenue to Cesar Chavez. This route has dedicated bike lanes (Class II facility) on both sides of Evans Avenue, and Hunters Point Boulevard between Innes Avenue and Third Street. San Francisco Bicycle Plan Project 4-4: Innes Avenue Bicycle Lanes, will involve the installation of Class II or III bicycle facilities in both directions of Innes Avenue between Donahue Street and Hunters Point Boulevard. See section 4.3.3.

East-West Route #70 runs along Palou Avenue, Silver Avenue, and Monterey Boulevard between the Bayview Hunters Point area and West Portal as a Class III facility. The eastern terminus of this route is currently the Crisp south gate to Hunters Point Shipyard at Griffith Street and Palou Avenue.

Route #170*:* Connector Route #170 runs along Oakdale Avenue between Third Street and Bayshore Boulevard. Between Third Street and Bayshore Boulevard, this route has Class II bicycle lanes on both sides of the street.

Route #805*:* Connector Route #805 is a Class III facility that provides a connection between Beatty Avenue and Tunnel Avenue (near the Bayshore Caltrain Station) in Brisbane and Third Street and Carroll Avenue in the Bayview Hunters Point area. This route passes around Candlestick Park stadium and the Candlestick Point State Recreation Area via Harney Way, Hunters Point Expressway, Gilman Avenue, Arelious Walker Drive, and Carroll Avenue.

Route #905: Route #905 is a short Class III route that runs along Tunnel Avenue south, east of Bayshore Boulevard.

Route #907: Route #907 is a short Class II route that runs along Indiana Street between César Chávez Street and the embankment at Islais Creek, where it dead-ends.

Route #925: Route #925 is a short Class III route that runs along Blanken Avenue between Tunnel Avenue and Bayshore Boulevard, connecting Route #5 and Route #905.

The San Francisco Bay Trail is designed to create recreational pathway links to the various commercial, industrial and residential neighborhoods that surround the San Francisco Bay. In addition, the trail connects points of historic, natural and cultural interest; recreational areas such as beaches, marinas, fishing piers, boat launches, and over 130 parks and wildlife preserves totaling 57,000 acres of open space. At various locations, the Bay Trail consists of paved multi-use paths, dirt trails, bike lanes, sidewalks or city streets signed as bike routes. Within the study area, the Bay Trail has two discontinuous segments of existing, off-street pathways, one in the area of Candlestick Point and Harney Way, and another segment which partially surrounds India Basin. The Bay Trail currently bridges the gap between Islais Creek and Candlestick Point with an inland route that shares portions of Gilman Avenue, Arelious Walker Drive, Carroll Avenue, Ingalls Street, Yosemite Avenue and Third Street.

An improved trail exists in the southern part of the Candlestick Point State Recreation Area where public access improvements have been made, but the northern section is unimproved. The trail starts northeast of the U.S. 101 northbound Harney Way ramps. Parking is available off of Harney Way, west of Jamestown Avenue (approximately 30 parking spaces are currently provided), and parking, restrooms, and boat ramp facilities are provided off of Hunters Point Expressway near Gilman Avenue.

The Project includes development of the Bay Trail within the Project site along the shoreline through Candlestick Point and Hunters Point Shipyard. The Bay Trail is also planned to be extended south to Sierra Point on the west side of U.S. 101, potentially as part of the proposed development at Brisbane Baylands.

The majority of the study area is flat, with limited changes in grades, facilitating bicycling within and through the area. East of Third Street, there are active and inactive rail tracks within the roadways that could impede bicycle travel. Bicycle volumes were collected at four locations with the study area during the weekday AM (7 to 9 AM), weekday PM (4 to 6 PM) and Saturday midday (12 to 2 PM) periods in September 2007. All four locations are along the bicycle route network, and bicycle lanes are provided on Evans Avenue and Oakdale Avenue. **Table 20** summarizes the data collection effort for the peak hour of bicycle activity. As indicated in **Table 20**, there are more bicyclists on study area streets on weekdays, than on weekends. Third Street and Oakdale Avenue had the greatest number of bicyclists.

Table 20
Bicycle Volumes within Study Area – Existing Conditions

Count Location	Weekday AM [1]	Weekday PM [2]	Saturday Midday [3]
Third St – between Williams & Palou	21	21	3
Evans Ave – between Mendell & Third	7	8	3
Oakdale Ave – between Phelps & Third	27	14	2
Hunters Point Expressway – between Jamestown & Gilman	1	4	1

Notes:
1. Hourly volume between 8 and 9 AM
2. Hourly volume between 4 and 5 PM
3. Hourly volume between 12 and 1 PM
Source: LCW Consulting, September 2007 counts.

3.6 PEDESTRIAN CONDITIONS

Pedestrian facilities vary within the study area between the areas on the east side of Third Street and the industrial land uses surrounding the Caltrain rail corridor on the west side of Third Street. On the west side of Third Street, many of the commercial facilities surrounding the railroad mainline have partial or no sidewalks. Several of the streets in this area have active and inactive railroad tracks and many of the former industrial and storage buildings in the area retain large raised freight loading/unloading platforms abutting the street.

On Third Street and on the residential streets immediately surrounding Third Street, the sidewalk network is adequate and relatively complete. In the light manufacturing areas surrounding Yosemite Slough the sidewalk network is less complete and frequently obstructed by illegally parked vehicles and or loading vehicles. The extent, condition and usability of the sidewalks generally decrease closer to Yosemite Slough (within the Project area).

The Candlestick Point State Recreation Area has a network of existing multi-use trails that extend from the County Line to a point just southeast of the intersection of Gilman Avenue and Donahue Street (an as yet undeveloped 'paper' street). Most of these paths are within the park and do not intersect the local roadways, although some connect to, or are part of, the Bay Trail.

There are several dedicated pedestrian overcrossings in the vicinity of Candlestick Park. These structures are designed to reduce pedestrian-vehicle conflicts associated with Candlestick Park events and adjacent schools. These include the overcrossing of Jamestown Avenue just north of Harney Way, overcrossing of Harney Way, just west of Jamestown Avenue, and overcrossing of Gilman Avenue at Griffith Street (Adjacent to the Bret Harte School).

Pedestrian activity in the immediate vicinity of the Project site is light throughout the day during non-game days. During game days, pedestrians flood the area traveling between the on-site and off-site parking facilities and the stadium (game day conditions are discussed in section 3.8).

Third Street is the primary pedestrian corridor in the study area, with the central commercial core located roughly between Thomas Avenue and Kirkwood Streets (south of Evans Avenue). Counts of pedestrian volumes at crosswalks at three intersections on Third Street were conducted in September 2007 during the weekday AM and PM peak periods, and peak hour pedestrian volumes are summarized in **Table 21**.

Table 21
Pedestrian Crosswalk Volumes at Study Area Intersections
Weekday AM and PM Peak Hour Conditions

Intersection/Crosswalk Location	Weekday AM [1]	Weekday PM [2]
Third/Evans		
North	49	18
South	24	39
East	120	94
West	39	24
Total	*232*	*175*
Third/Palou		
North	295	364
South	219	403
East	301	363
West	131	234
Total	*946*	*1,364*
Third/Paul		
North	63	41
South	136	157
East	229	191
West	60	96
Total	*488*	*485*

Notes:
1. Hourly volume between 8 and 9 AM
2. Hourly volume between 4 and 5 PM
Source: LCW Consulting, September 2007 counts.

3.7 PARKING CONDITIONS

This section presents the existing parking conditions within the study area for typical weekday conditions, and for conditions during a 49er game at the existing stadium. On-street parking conditions were based on field surveys conducted in October 2007 during the weekday midday (1:30 to 3:00 p.m.) and evening (6:30 to 8:00 p.m.) periods. Surveys were also conducted during a Sunday midday (1:30 to 3:00 p.m.) period during a 49ers game at the existing stadium. The 1:30 to 3:00 PM Sunday time period is the peak parking period during football games at the existing stadium because spectators would have already arrived at the stadium. Transportation Study Appendix I contains the detailed parking survey results. Off-street parking supply for game day conditions was obtained from 49ers and compared against information previously collected by SFMTA.

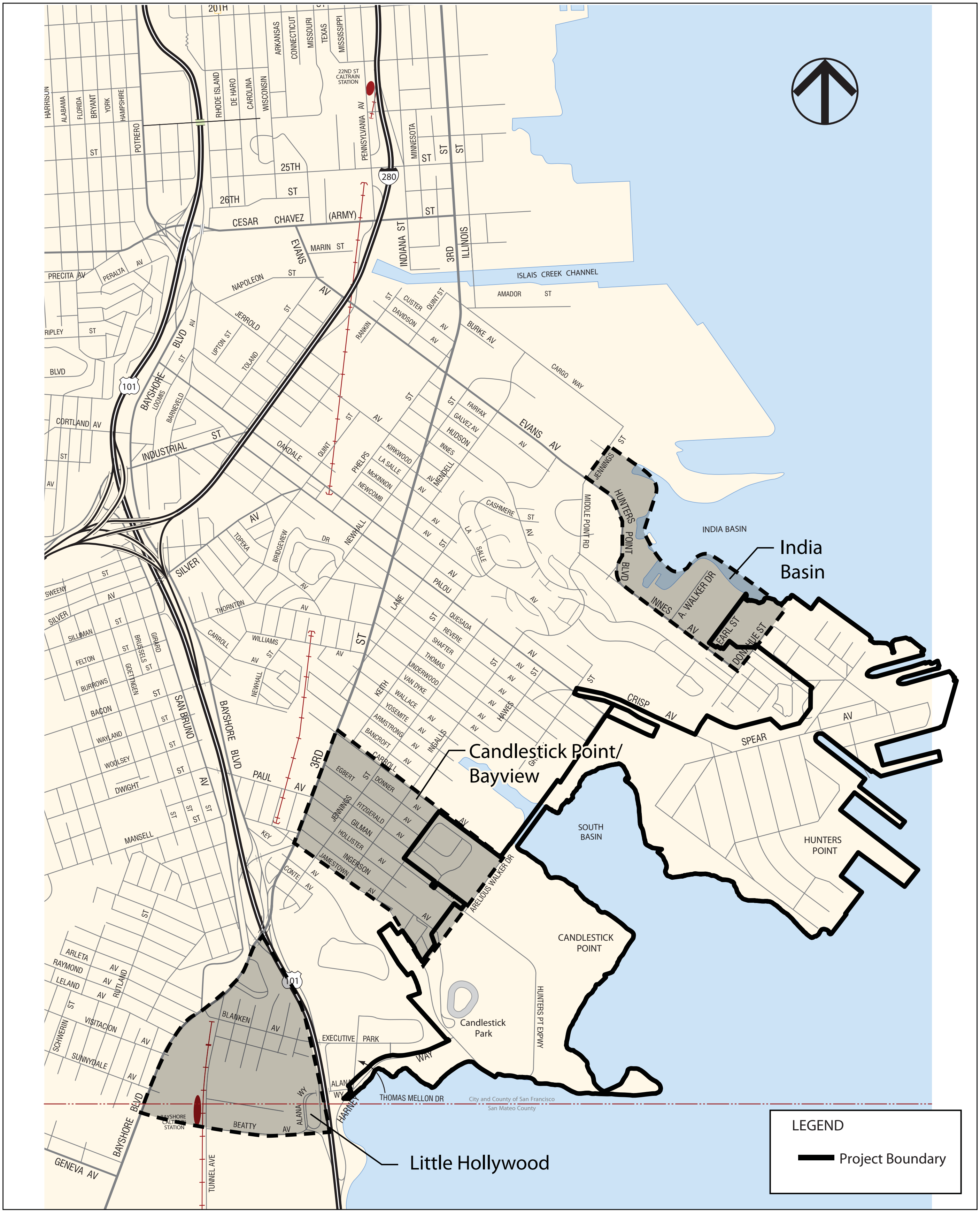
3.7.1 On-Street Parking Conditions

In general, on-street parking in the transportation study area is generally unrestricted (other than weekly street cleaning), and is typically permitted on both sides of the street. On the wider avenues in the study area (generally with an 80-foot wide right-of-way width) with light industrial land uses, roadways, such as Donner Avenue and Bancroft Avenue between Jennings and Hawes Streets, accommodate 90-degree perpendicular parking. Along Third Street on-street parking is metered, and has been removed in the vicinity of the light rail stations. There are no Residential Permit Parking (RPP) areas within the study area.

On-street parking supply and occupancy surveys were conducted for two subareas within the transportation study area, as shown on **Figure 23**:

- Candlestick Point/Bayview – within the mostly residential and partial industrial area bounded by Third Street to the west, Carroll Avenue to the north, Arelious Walker Drive to the east, and Jamestown Avenue to the south.
- Little Hollywood – within the mostly residential area bounded by Bayshore Boulevard to the west and north, U.S. 101 to the north and east, and the San Francisco/San Mateo County line to the south.
- India Basin – Within the mostly industrial area bounded by Jennings Street to the west, Hunters Point Boulevard to the south, Donahue Street to the east, and India Basin to the north.

Table 22 presents the weekday midday and evening parking supply and occupancy for the two subareas. During the daytime, on-street parking utilization is greatest in the Candlestick Point/Bayview subarea, and ranges between 66 percent during the midday period (accommodating employee parking demand associated with the industrial uses) and 57 percent during the evening. Parking demand within the Little Hollywood residential neighborhood is greatest during the evening period, with parking occupancy at about 60 percent.



SOURCE: CHS Consulting

FIGURE 23: ON-STREET PARKING STUDY AREAS

Of the three subareas, parking utilization is lowest within the India Basin subarea (between 17 and 28 percent), reflecting the limited residential and industrial uses in this area. Transportation Study Appendix I contains the detailed parking survey results.

Table 22
On-Street Parking Supply and Utilization
Existing Conditions

Parking Subarea	Supply (spaces)	Occupancy			
		Weekday Midday		Weekday Evening	
		Spaces	% Utilization	Spaces	% Utilization
Candlestick Point/Bayview	1,405	931	66%	807	57%
Little Hollywood	773	415	54%	466	60%
India Basin	398	110	28%	69	17%

Source: CHS Consulting.

There are no city-owned off-street parking facilities in the study area. There is limited number of privately-owned parking facilities in this subarea and most drivers rely on on-street parking in the area. The available privately-owned off-street parking facilities serve the employees and visitors to the businesses adjacent to them and are not available for general public parking.

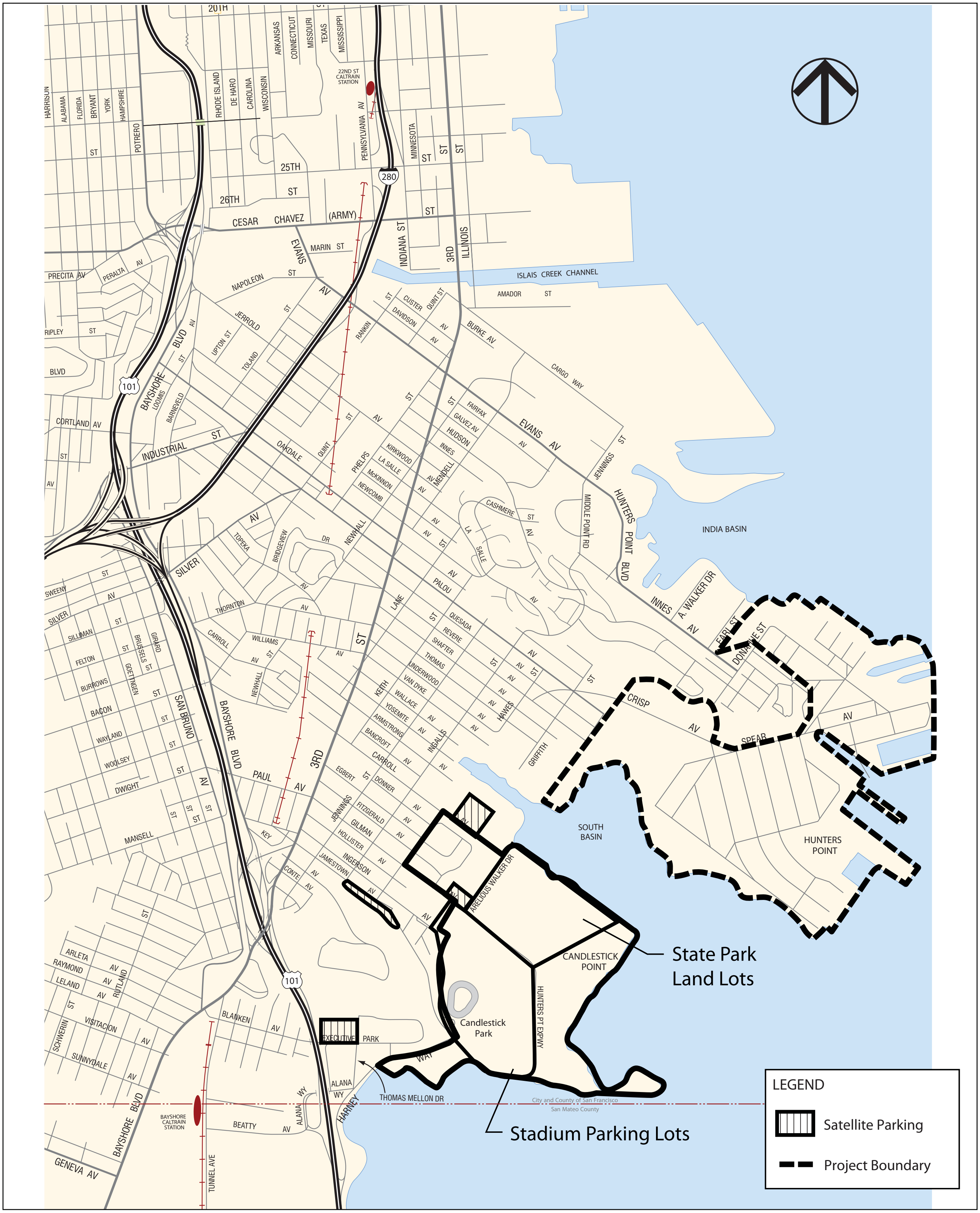
3.7.2 Game Day Parking Conditions

Game day parking demand for 49er games at the existing stadium is accommodated within off-street surface parking lots and on-street parking adjacent to the neighborhood and to the west in the Little Hollywood neighborhood. Game day parking demand varies depending on attendance levels, and maximum demand occurs during sell-out games. Game day conditions typically occur up to 12 times per year (two pre-season games, eight regular games, and usually up to two post-season games). During the last two seasons, two pre-season and eight regular games were played at Candlestick stadium.

Off-Street Parking

Parking for 49er games is provided within stadium parking lots, on state park land, and in satellite parking lots. These areas are identified on **Figure 24.**

- Stadium Parking: Stadium parking consists of the paved parking spaces that are located on the existing stadium premises in the area generally bounded by Hunters Point Parkway, Gilman Avenue, Giants Drive and an internal circulation road on the west side of the stadium.
- State Park Land Parking: Stadium event parking lots are also located between Hunters Point Expressway and the San Francisco Bay, east and northeast of the stadium premises. Most of these lots are unpaved and are located on undeveloped state park land owned by the state.



SOURCE: 49ers, 2008

FIGURE 24: EXISTING STADIUM OFF-STREET PARKING AREAS

- Satellite Parking: Satellite Parking in the study area consists of off-street lots north, west and southwest of the stadium. Existing satellite lots are located: 1) north of the stadium at the intersection of Gilman Avenue and Giants Drive, 2) west of the stadium along Jamestown Avenue, and 3) southwest of the stadium in the Executive Park Office complex.

Table 23 presents the total game day parking supply by the three parking areas.

Table 23
Off-Street Parking Supply for 49er Games
Existing Game Day Conditions

Parking Area	Supply (spaces)[1]
Stadium Parking	9,110
State Park Land Parking	5,470
Satellite Parking	
Executive Park Lots	1,950
Jamestown Lot	1,250
True Hope Church Lot	110
Hawes-Carroll Lot	990
Subtotal	4,300
Total	***18,880***

Note:
1. This inventory does not include private parking spaces that are generally restricted for use by residents, customers and employees of private businesses, or public agencies, however, some of the spaces are in private lots (e.g., churches) that are made available to the public on football game days.
Source: 49ers, 2009.

As indicated in **Table 23,** there are approximately 18,880 off-street parking spaces in the study area. All of the spaces are located in surface parking lots. Approximately 48 percent of the off-street parking spaces are located in the stadium parking lot (9,110 spaces for autos, buses, recreational vehicles, limousines, press and players), 23 percent are located in state park land lots (5,470 spaces), and 29 percent are located in satellite parking lots (4,300 spaces).

In addition to the satellite parking lots, there are a number of parking spaces in private lots that are generally restricted for use by residents, customers and employees of private businesses, or public agencies, however, some of the spaces are made available to the public on football game days. The 49ers estimate that up to 3,000 spaces are available on private land for game day parking.

In general, many football spectators arrive up to five hours before kickoff to prepare and eat food and drink beverages near their vehicles in the parking lots. These "tailgate" parties take place in the car and RV parking lots. Based on previously-collected information on stadium parking accumulation, on a typical game day, up to 40 percent of vehicles arrive between one and two hours prior to kickoff.[13]

On-Street Parking

During game days, parking restrictions are implemented to increase traffic capacity in and out of the facility and to reduce congestion. **Table 24** identifies the streets and segments in the Project vicinity where parking is prohibited between 10:00 a.m. and 6:00 p.m. on game days. In addition to these roadways, on-street parking is also restricted east of Third Street on Salinas Avenue and Gilroy Street.

Table 24
Game Day On-Street Parking Restrictions
Existing Game Day Conditions

Street	Segment	Side of Street
Carroll Avenue	- Jennings Street to Hawes Street - Third Street to Ingalls Street	South side North side
Gilman Avenue	- Third Street to Giants Drive - Giants Drive to a point about 365 feet west of Griffith Street	North side South side
Jamestown Avenue	- Third Street to Redondo Street - Stadium roadway to Third Street	Both sides North side
	- Harney Way to Hunters Pt Expressway	South side
Ingerson Avenue	- Third St to a point about 500 feet east of Griffith Street	Both sides
Paul Avenue	- Third Street to San Bruno Avenue	North side
Third Street	- Jamestown Avenue to Salinas Avenue	West side

Source: SFMTA.

Table 25 presents the parking supply and occupancy during game days for the two parking subareas. On game days between the hours of 10:00 a.m. and 6:00 p.m., the on-street parking supply in the Candlestick Point/Bayview subarea is reduced by about 32 percent due to the parking restrictions identified in **Table 25.** In the Little Hollywood neighborhood, there are no specific on-street parking restriction on game days, and the game day parking supply remains the same as on non game days.

[13] from 49ers data provided for the Candlestick Point Stadium and Retail/Entertainment Center EIR – Transportation and Circulation Report, Second Preliminary Draft, February 1998.

Table 25 On-Street Parking Supply and Utilization Existing Game Day Conditions			
Parking Study Area	**Supply [1] (spaces)**	**Game Day – Sunday Midday Occupancy**	
		Spaces	**% Utilization**
Candlestick Point/Bayview	948	815	86%
Little Hollywood	773	849	110%
India Basin	398	87	22%

Note:
1. Game Day on-street parking restrictions on Carroll Avenue, Gilman Avenue, Jamestown Avenue, Ingerson Avenue, Paul Avenue, and Third Street.
Source: CHS Consulting.

On football game Sunday afternoons, approximately 86 percent of the 948 on-street parking spaces in the Candlestick Point/Bayview subarea are occupied. In the Little Hollywood neighborhood, all on-street parking spaces are occupied and a number of vehicles were observed to park illegally, resulting in an inconvenience to residents and their guests.

3.8 EXISTING STADIUM OPERATIONS DURING GAME DAYS

The additional traffic added to the transportation network following a football game at Candlestick Park results in substantial congestion on local streets between parking facilities and the freeway, and on the freeways, particularly where game day traffic merges with other traffic already on the freeway. This section discusses the existing transportation conditions on days when football games are played at Candlestick Park.

3.8.1 Football Game Frequencies

Candlestick Park currently serves as the home of the San Francisco 49ers. The existing Candlestick Park stadium typically hosts up to 12 games per year, including eight regular season games, typically two pre-season games, and for teams that qualify for playoffs, typically two post-season games. Professional football games on the west coast are typically scheduled for 1:00 p.m. (Pacific Time) on Sundays, from September through early December. The post-season runs into January and games can be played on either Saturday or Sunday. At the conclusion of the college football season in late November, a few NFL games are played on Saturdays, as are some pre-season games. Successful teams typically play at least one Monday night (6:00 p.m.) game, and the 49ers have had at least one such home game in each of the past several seasons. Occasionally (no more than once per year), Sunday games are held at 5:00 p.m. The typical duration of a football game is approximately three hours.

3.8.2 Pre-Game and Post-Game Circulation

Ingress and Egress Routes

The major access and egress routes to the existing stadium are shown in **Figure 25** and **Figure 26**, respectively. Vehicles access Candlestick Park by several routes, depending on the level of congestion and their point of origin. Most vehicles arriving from the south (San Mateo and Santa Clara Counties, as well as traffic from Alameda County using the San Mateo or Dumbarton Bridges) use northbound U.S. 101 and enter the site via the Harney Way exit. Vehicles from the north coming from either I-280 or U.S. 101 use the Silver Avenue, Paul Avenue, Bayshore Boulevard/Third or the Alana/Beatty exits to reach the north access routes (Carroll, Gilman, and Jamestown) to the stadium. In order to accommodate peak inbound and outbound traffic volumes generated by the largest special events at Candlestick Park, traffic lanes on Harney Way and on the roadway surrounding the Candlestick Park parking lot (Jamestown Avenue Extension, Hunters Point Expressway and part of Gilman Avenue) are reversed on event days. Overhead Lane Use Control Signals are used to designate the direction of each lane.

On event days, each lane has either a green downward-pointing arrow or a red arrow above it to indicate to drivers in each direction whether they may drive in that lane. The portion of Harney Way between Alana Way near U.S. 101 and Jamestown Avenue operates one-way eastbound (toward Candlestick Park) for several hours before events. Jamestown Avenue Extension and Hunters Point Expressway operate one-way counterclockwise before events. The portion of Gilman Avenue west of Candlestick Park Parking Lot Gate 4 is two-way before events in order to provide access to Gate F from the west. Once the pre-event traffic dies down, these roadways are converted back to two-way operation. In the last 30-60 minutes before the end of the event, the reversible roadways are converted to one-way operation away from the parking lot exits. Gilman Avenue operates one way westbound, while Hunters Point Expressway, Jamestown Avenue Extension and Harney Way operate one-way clockwise and westbound, respectively. During the post-game period, the Candlestick Park exit from northbound U.S. 101 is closed to all traffic, in order to prevent off-ramp traffic from conflicting with the one-way westbound post-event traffic on Harney Way. Additionally, all traffic using the Candlestick Park exit from southbound U.S. 101 is forced to proceed westbound on Beatty Avenue in order to prevent this traffic from having to make a U-turn if it were to proceed eastbound on Alana Way. Once the post-event traffic dies down, the roadways revert to the normal two-way operation.

SOURCE: Fehr & Peers, 2009

FIGURE 25: EXISTING STADIUM INGRESS ROUTES

SOURCE: Fehr & Peers, 2009

FIGURE 26: EXISTING STADIUM EGRESS ROUTES

Traffic Operations

Pre-Game Conditions: For a typical Sunday football game starting at 1:00 PM, vehicle arrival is spread over about six hours with approximately 40 percent of the vehicles arriving between one and two hours prior to the game start time, and 60 percent within the other five hours prior to the game. Since the arrival is spread out over a period of time, the game-related traffic does not substantially affect traffic flow on the study area freeways. During a recent Sunday football game, some localized congestion was observed at U.S. 101 northbound upstream of the Harney Way exit, as vehicles queued up from Harney Way and on U.S. 101 southbound upstream of the Alana/Beatty exit. The vehicles accessing the stadium from Third Street contribute to congestion and queues on the local residential streets, including Third Street, Gilman Avenue, Carroll Avenue and Jamestown Avenue. In September 2009, a pedestrian bridge was installed on Hunters Point Expressway at the location of the pedestrian crossing to the State Park parking lots. Since installation of the pedestrian bridge, pre-game traffic conditions improved.

During pre-game conditions, San Francisco Police Department officers, Parking Control Officers (PCOs) and California Highway Patrol (CHP) officers are posted on roadways leading to the stadium, in particular Harney Way, Hunters Point Expressway, Ingerson Avenue and Gilman Avenue. Officer tasks include: ensuring smooth traffic flow on the one-way inbound Harney Way, directing vehicles to proceed to downstream gates and off-site parking lots, and towing vehicles that obstruct traffic movement. In addition, they are responsible for providing priority to transit vehicles, ensuring pedestrian safety, and orderly queuing at the gates to the internal parking lot. Approximately 60 officers are posted during a football game.

Post-Game Conditions: Immediately following the end of the game, most spectators attempt to leave the stadium parking facilities, although depending on the game outcome, some patrons leave early to avoid congestion and a portion remain for tailgate parties. Players, press, administrative staff, and employees generally remain on-site longer than spectators. Typical clearance times for each of the egress routes following a sell-out football game vary; however, congestion and queues in the vicinity of the stadium generally clear up approximately one and a half to two hours following the end of the game.

During post-game conditions, Harney Way is converted to one-way outbound operation, with two lanes merging to one onto the northbound on-ramp and two lanes continuing onto Alana Way to access the southbound on-ramp and Beatty Avenue. To facilitate flow onto the on-ramps, the U.S. 101 northbound off-ramp is closed at Harney Way, and the allowable movements at the southbound off-ramp are restricted to westbound through onto Beatty Avenue. During post-game conditions, the southbound on-ramp is metered via a ramp metering signal to ensure stable traffic conditions on freeway mainline. Travel lanes on the mainline are also closed to increase the capacity of the on-ramp during post-game conditions. Field observations during recent games indicated that there is some localized congestion on U.S. 101 southbound upstream of and at the ramp merge influence area. Caltrans uses Variable Message Signs (VMS) on southbound U.S. 101 and southbound I-280 upstream of the on-ramp to direct through traffic to southbound I-280 instead of southbound U.S. 101 during post-game conditions.

On U.S. 101 northbound, stadium traffic generally does not have difficulty merging with the freeway mainline traffic, as northbound U.S. 101 traffic volumes approaching Harney Way are generally lower than the southbound volumes. However, as stadium traffic merges with I-80 eastbound traffic leaving downtown San Francisco, congestion and queues extend upstream from the Bay Bridge to the U.S. 101/I-280 merge. This congestion persists long after all congestion and queues dissipate in the vicinity of Candlestick Point.

The surge of vehicles exiting the parking facilities results in queues on the internal roadways and at access roads to Third Street and the on-ramps to U.S. 101. The queues on Jamestown Avenue, Gilman Avenue, and Carroll Avenue are mainly constrained by the capacity of the intersections of the respective street at Third Street. The traffic signals on Third Street are timed to prioritize transit movements along Third Street, including the T-Third light rail, which results in limited capacity for cross-traffic.

During post-game conditions, the San Francisco Police Department officers, PCOs and CHP officers ensure that traffic exits the stadium parking facilities in an orderly fashion and that vehicles access the regional routes as quickly as possible. Responsibilities of the officers include waving vehicles through STOP signs and ensuring that Ingerson Avenue is used by buses, taxis and emergency vehicles. A CHP officer is posted at the intersection of Alana/Beatty to wave vehicles through the STOP sign and onto the U.S. 101 southbound on-ramp. However, many vehicles come to a full stop prior to processing through the intersection.

3.8.3 Transit Services

Muni and Tri-Delta Transit and numerous private charter bus operators provide game day special services to Candlestick Park. BART, AC Transit, and Caltrain do not provide any special game day services. The San Mateo County Transit District (SamTrans), Golden Gate Transit, and the Santa Clara Valley Transportation Authority (VTA) have historically provided transit service to Candlestick Park; however, they have recently stopped providing this service, which will instead be provided by private charter companies.

Muni: On game days, Muni offers express services 75X, 77X, 78X, and 79X to and from the stadium. Line 75X provides express, non-stop shuttle service between Candlestick Park and the Balboa Park BART Station (via Geneva Avenue and Bayshore Boulevard). Line 77X provides express service from the Van Ness corridor, with service between the intersection of California/Van Ness and Candlestick Park (via Van Ness Avenue, South Van Ness Avenue, Mission Street and U.S. 101). Line 78X provides express service along the Park Presidio/19th Avenue corridor, from the Funston/California intersection (via Park Presidio, 19th Avenue, Junipero Serra Boulevard, Ocean Avenue, Geneva Avenue, and Bayshore Boulevard). Line 79X provides express service from downtown, with service between Candlestick Park and the Sutter/Montgomery intersection (via Stockton Street, Fourth Street, Folsom Street and U.S 101). The service starts about three hours prior to the beginning of the football game, and operates at headways of approximately 7 to 10 minutes.

Muni also operates special shuttle services from the Bacon/San Bruno intersection (86-Stadium Shuttle) and from the Gilman/Paul T-Third station (87-Stadium Shuttle). The shuttle service begins about four hours before the game and operates at approximately 5 to 10 minute headways. Approximately 6,500 spectators currently use the special Muni bus services to the stadium.

Tri-Delta Transit: Tri-Delta Transit provides one special game day bus to Candlestick Park from eastern Contra Costa County, with stops in Brentwood, Antioch, and Pittsburg. Tickets may be purchased in advance, or on the bus on the day of the games.

Neither AC Transit not BART provide special game day service. AC Transit riders need to take AC Transit to the San Francisco Transbay Terminal, walk to the intersection of Sutter/Montgomery intersection and transfer to the Muni 9X-Bayshore Express to the stadium. BART riders from East Bay need to take BART to the Montgomery Station and transfer to the Muni 9X-Bayshore Express to the stadium. BART riders from San Mateo County need to take BART to the Balboa Park station and transfer to Muni Line 28X at Geneva Avenue.

Charter Buses: A substantial number of spectators using transit come by private charter buses. Various groups charter buses from private companies including Frontier Tour Charter Bus, Evans, Pro Trav Charter and Sierra Pacific Tours. According to the San Francisco 49ers, approximately 3,000 spectators currently arrive and leave by private charter bus. In addition, private charter service from Santa Clara, San Mateo, Marin, and Sonoma counties will be initiated this season, replacing service previously provided by the VTA, SamTrans, and Golden Gate Transit, respectively. Routes and service are expected to be similar to that previously provided by those operators.

Bus Access and Parking: Buses from the north generally access the stadium by way of Ingerson or Jamestown Avenue, using the Third Street or Paul Avenue exits from U.S. 101 southbound. Buses from the south access the stadium using the Third Street exit. Ingerson Avenue between Third Street and Giants Drive is exclusively used by buses, taxis, and emergency vehicles during pre- and post-game periods.

Southbound buses leaving the stadium generally use westbound Ingerson Avenue to southbound Third Street and take the southbound U.S. 101 on-ramp at Bayshore/Third. Northbound buses use northbound U.S. 101 via the on-ramp at Bayshore/Third. The special Muni shuttle to San Bruno/Bacon turns from Ingerson Avenue onto Third Street northbound, and left at Gilman/Paul.

In general, buses operate inbound on Jamestown Avenue during the pre-game period and outbound on Ingerson Avenue during the post-game period.

Muni buses load and unload passengers along the drop-off roadway (Giants Drive) north of Jamestown Avenue. Other buses (including charters) load and unload in the main parking lot.

Muni buses park free along the drop-off roadway (Giants Drive) parallel to Jamestown Avenue. All other buses park in the main parking lot. The buses in the main lot are parked end-to-end. As a result, some fully loaded buses after the game are delayed until the bus parked in front of them leaves.

3.8.4 Pedestrian Circulation

The number of pedestrians in the vicinity of the stadium is highest during post-game conditions with spectators exiting the stadium at once. The primary pedestrian flows are towards the internal and off-site parking areas east of the stadium, and towards the parking areas along Harney Way and Little Hollywood/Tunnel Avenue, and to the off-site lot along Jamestown Avenue and T-Third line on Third Street.

The two pedestrian overcrossings, one crossing Jamestown at Harney Way, and one crossing the drop-off loop (connecting with Jamestown Avenue approximately 350 feet north of Harney Way), are too narrow to accommodate the surge of pedestrians leaving the stadium. Queues form at the approaches to the pedestrian overcrossings, particularly at Jamestown/Harney. This crossing has fences on either side of the sidewalk to channelize pedestrians and to prevent pedestrians from crossing Jamestown Avenue or Harney Way at-grade.

East of the stadium, pedestrian flows generally spread out throughout the internal lot, and cross Hunters Point Expressway at-grade along the roadway. These uncontrolled crossings often result in conflicts between pedestrians and vehicles, and police occasionally control these crossings. In September 2009, a pedestrian bridge was installed on Hunters Point Expressway at the location of the at-grade pedestrian crossing to the State Park parking lots.

Chapter 4
DEVELOPMENT OF FUTURE CONDITIONS AND SIGNIFICANCE CRITERIA

This chapter describes the methodology used to develop future year cumulative No Project conditions used in the impact analysis, the methodology for determining Project travel demand, and the background transportation network improvements that are anticipated to be implemented by year 2030. This chapter also presents the significance criteria used to identify significant transportation impacts.

The analysis of the Project, Project Variants and Alternatives to the Project was conducted for future year 2030 conditions. Year 2030 was selected as the future analysis year, since the San Francisco County's travel demand model (SF-CHAMP) used in the analysis develops traffic and transit forecasts for cumulative development and growth through the year 2030. The Project impact analysis was conducted for 2030 conditions, rather than existing conditions, to account for the significant roadway and transit network and development changes associated with the Project that would occur over a period of about 20 years (Project construction to be initiated in 2011 and completed by 2029), and to account for the significant changes to the area that are projected to occur. The project impact analysis therefore represents a cumulative growth scenario for the year 2030 that includes growth from development that would occur with implementation of the proposed Project, as well as other, non-project generated growth and transportation network improvements accounted for in the 2030 No Project conditions.

4.1 DEVELOPMENT OF YEAR 2030 NO PROJECT CONDITIONS

Future year 2030 No Project conditions were developed via a two-step process which utilized (1) the San Francisco County's travel demand model (SF-CHAMP) to determine background traffic growth on study area roadways, and (2) traffic volume overlays to reflect traffic volume turning movements associated with nearby developments that are not fully reflected in the SF-CHAMP model output. Future year 2030 No Project conditions are the same as the alternative 1 No Project conditions.

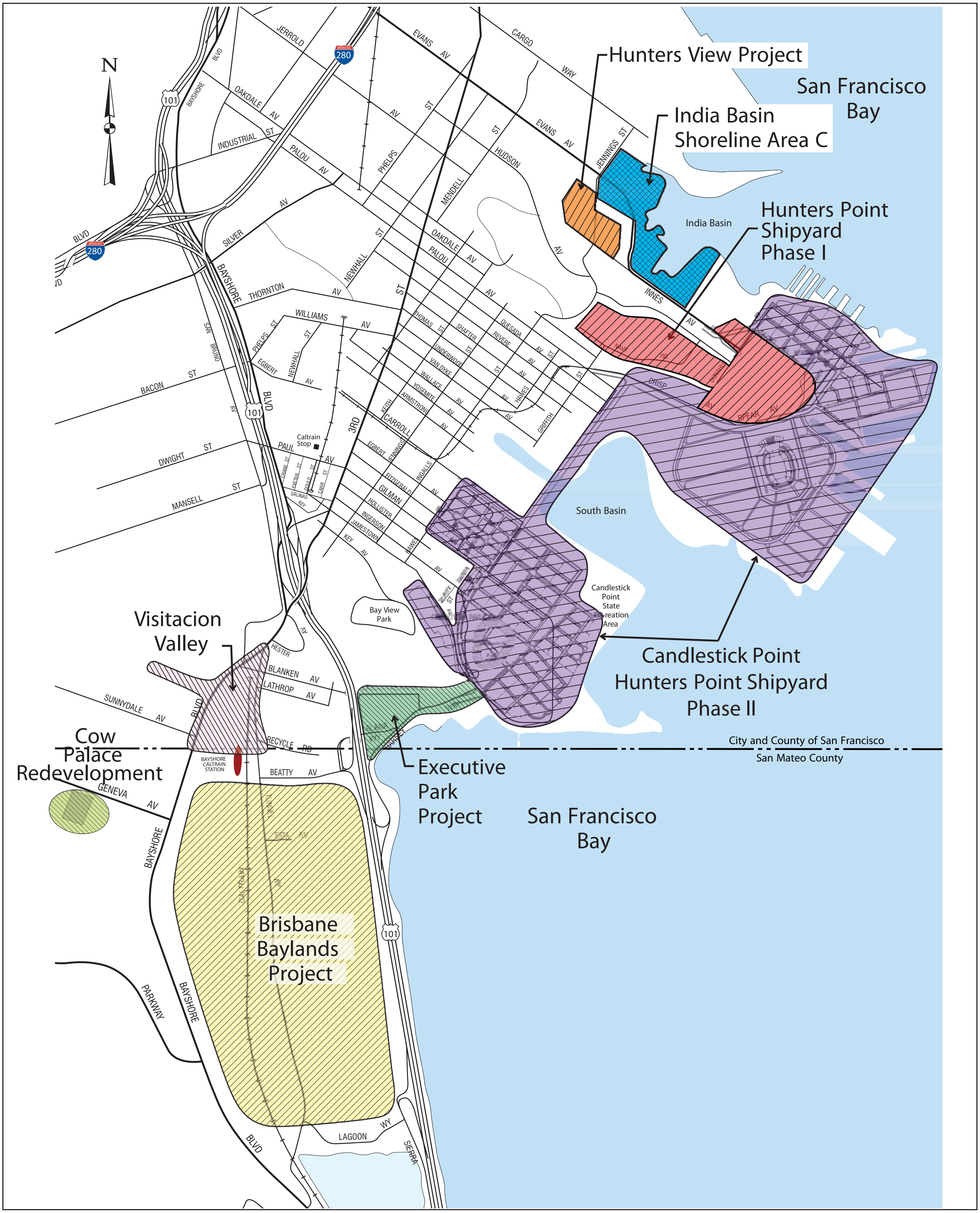
SF-CHAMP Model Growth Projections: Future year 2030 traffic volume forecasts were estimated based on cumulative development and growth identified by SF-CHAMP travel demand model. The SF-CHAMP model is an activity based travel demand model that has been validated to represent future transportation conditions in San Francisco and is updated regularly. The model predicts person travel for a full day based on assumptions of growth in population, housing units and employment, which are then allocated to different periods throughout the day, using time of day sub-models. The SF-CHAMP model predicts future person travel by mode for auto, transit, walk and bicycle trips. The SF-CHAMP model also provides forecasts of vehicular traffic on regional freeways, major arterials and on the study area local roadway network considering the available roadway capacity, origin-destination demand and travel speeds when assigning the future travel demand to the roadway network.

The SFCTA model divides San Francisco into approximately 981 geographic areas, known as Traffic Analysis Zones (TAZs). The SFCTA Model also includes zones outside of the City for which data is obtained through the current Metropolitan Transportation Commission (MTC) Model. For each TAZ, the SFCTA Model estimates the travel demand based on TAZ population and employment growth assumptions developed by the Association of Bay Area Governments (ABAG), determines the origin and destination and mode of travel (auto, transit, walk and bicycle) for each trip, and assigns those trips to the transportation system (roadway network and transit lines). The SFCTA output is developed on a weekday daily and a three-hour AM and PM period basis.

The SFCTA Model travel demand estimates incorporate the ABAG land use and socio-economic database and growth forecasts for the year 2030 (Projections 2007), which provide forecasts of economic and population growth for the County of San Francisco, as well as for the remaining eight Bay Area counties. Within San Francisco, the San Francisco Planning Department is responsible for allocating ABAG's countywide growth forecast to each SFCTA Model TAZ, based upon existing zoning and approved plans, using an area's potential zoning capacity and the anticipated extent of redevelopment of existing uses.

The increase in vehicle trips between existing conditions and 2030 No Project conditions was based on a comparison between model output that represents existing conditions and model output for 2030 conditions. The growth was then added onto existing intersection traffic volumes.

Local Development Traffic Overlays: In the vicinity of the Project, there are a number of development proposals that have recently been approved or are in the environmental review stages. **Figure 27** presents the general location of the planned development within San Francisco and nearby within City of Brisbane limits. While these projects had been included as part of the growth projections used for developing future conditions using the SF-CHAMP model, in order to account for the localized effects of traffic and transit demand, the trip generation associated with these projects was extracted from the SF-CHAMP model output, and travel demand estimates used in the environmental review of these projects were added to the traffic volume estimates developed in the previous step.



SOURCE: Fehr & Peers; AECOM

FIGURE 27: PROPOSED NEARBY DEVELOPMENTS

Specifically, these projects include the Visitacion Valley Redevelopment program (Visitacion Valley Redevelopment Program Final EIR), Hunters View (227-229 West Point Road EIR), Executive Park Development Plan (conversion of office space to residential, neighborhood serving retail and community space – EIR ongoing), and Brisbane Baylands. Travel demand and vehicle assignments for the Visitacion Valley and Hunters View projects were obtained from technical analyses conducted for the EIRs. The analysis of Executive Park is ongoing, and the latest traffic and transit data, including vehicle assignments, was obtained from the Planning Department. Travel demand for the Brisbane Baylands was based on the trip generation analysis conducted by the transportation consultant for the development plan proposed by the Project Applicant in 2008. The 2030 No Project condition also assumes development within Hunters Point Shipyard associated with the approved Phase 1, buildout of the existing Hunters Point Shipyard Redevelopment Plan, and proposed development within India Basin. Travel demand associated with Hunters Point Shipyard and India Basin development was developed consistent with the methodology described below for the Project conditions. No new development was assumed for Candlestick Point, as there are no previously approved plans for the area. The new vehicle and transit trips associated with each development were then manually added to the SFCTA Model 2030 baseline conditions.

Table 26 presents the land use program for the development projects included in determining the future travel demand. For each development proposal, the PM peak hour vehicle travel demand is presented.

Sunday PM Peak Hour Traffic Forecasts: Since the SF-CHAMP model is a weekday travel demand model, future year Sunday PM peak hour conditions were estimated based on the net growth developed for the weekday PM condition. Weekday PM to Sunday PM conversion factors were developed for each intersection, based on the existing relationship between weekday PM and Sunday PM peak hour, as determined from existing traffic counts.

Table 26
Proposed and Approved Nearby Developments Land Use Program and PM Peak Hour Vehicle Trip Generation

Proposed Nearby Developments	Net-New Land Use	PM Peak Hour Vehicle Trip Generation
India Basin Development Plan		
Residential (units)	1,240	1,270
Neighborhood Retail (gsf)	100,000	
Office (gsf)	1,365,000	
Hunters Point Shipyard Phase I		
Residential (units)	1,600	540
Neighborhood Retail (gsf)	20,000	
Hunters View Housing Development		
Residential (units)	800	660
Neighborhood Retail (gsf)	6,400	
Community Services (gsf)	21,600	
Executive Park - Candlestick Cove		
Residential (units)	3,400	3,210
Neighborhood Retail (gsf)	88,500	
Office (gsf)	-320,000	
Visitacion Valley Redevelopment Program		
Residential (units)	1,600	1,685
Regional Retail (gsf)	131,500	
Neighborhood Retail (gsf)	39,500	
Community Services (gsf)	25,000	
Brisbane Baylands Specific Plan		
Retail (gsf)	904,425	13,410
Big Box Retail (gsf)	668,100	
Office (gsf)	3,781,525	
Hotel/Extended Stay (gsf)	1,504,400	
Warehousing & Distribution (gsf)	247,450	
Research & Development (gsf)	601,600	
Exhibition Center (gsf)	373,650	
Auto Park (gsf)	200,000	

Source: San Francisco Redevelopment Agency, Lennar Urban, AECOM, 2009.

4.2 PROJECT TRAVEL DEMAND

This section presents the travel demand methodology and results for the Project, the Project Variants, and the Alternatives to the Project. Details related to travel demand for the Alternatives to the Project are included in Transportation Study Appendix J.

4.2.1 Methodology

The transportation effects of the Project were determined by calculating the daily person trips generated by the different types of land uses in the CP-HPS Phase II areas, and the portion of those trips that would occur during the analysis peak hours. After determining the number of person trips generated by the Project, the trips were distributed to geographical origins/destination areas, including five San Francisco areas (downtown CBD, the rest of Superdistrict 1[14], Superdistrict 2, Superdistrict 3, Superdistrict 4) and three other regions in the Bay Area (South Bay, East Bay and North Bay). The mode split analysis then determined the portion of these trips made via automobile, transit, or any other mode of transportation, based upon the origin/destination of the trips, the purpose of the trips, and the availability of various modes. Finally, automobile occupancy rates were determined, to yield the average number of individuals in a vehicle, and, thus, determine the number of vehicles that would be traveling to and from the Project study area.

The methods commonly used for forecasting trip generation of stand-alone development projects in San Francisco are based on person-trip generation rates, trip distribution information, and mode split data described in the Transportation Impact Analysis Guidelines for Environmental Review, SF Planning Dept, Oct 2002 (*SF Guidelines).* These data are based on a number of detailed travel behavior surveys conducted within San Francisco. The data in the *SF Guidelines* are generally accepted as more appropriate than conventional methods for use on smaller projects in the complex environs of San Francisco because of the relatively unique mix of uses, density, availability of transit, and cost of parking commonly found in San Francisco. Similarly, standard trip generation rates, such as those provided by *Trip Generation,* 7th Edition, 2003, Institute of Transportation Engineers, would not be suitable for the Project, unless appropriate adjustments are made to account for the Project size, mix, and availability of transit. In addition, the methods described in the *SF Guidelines*, or standard vehicle-traffic generation rates provided by *Trip Generation*, 7th Edition, 2003, Institute of Transportation Engineers, cannot be directly applied to the Project since these methods do not take into consideration the fact that all Project trips would not be new trips to the area. Instead, some of the estimated new Project trips would begin and end within the Project area. The standard methodologies for forecasting trip generation would “double-count” these trips.

To account for the trip making patterns of this multi-use development Project, a state-of-the-practice trip generation forecasting method was used in this analysis. This method was originally developed by Fehr & Peers and others for the U.S. Environmental Protection Agency (EPA) and has been endorsed for use in project-specific and planning-level analyses by a number of jurisdictions, including the California Department of Transportation (Caltrans). This method is commonly referred to as the “4D” method, and generally accounts for the following factors that may influence travel behavior:

[14] Superdistricts are travel analysis zones established by the Metropolitan Transportation Commission (MTC). San Francisco is divided into four Superdistricts delineated to capture the different travel characteristics that are associated with the various street network, transit opportunities, and geographical constraints of different areas of San Francisco. Appendix J includes the boundaries that define the superdistricts.

- **Development scale** – the amount of trips generated increases as the amount of development increases
- **Density of the project** – the higher the project's density, the less vehicular traffic generated per unit of development
- **Diversity of uses –** an appropriate mix of uses can lead to internalization of trips and trip-linking within a project
- **Design of project** – a walkable, pedestrian- and bicycle-oriented circulation system can help to reduce automobile dependence within a project site

A detailed description of how these factors can be used to adjust standard traffic generation rates was provided in a letter to the City of San Francisco Planning Department dated August 4, 2008 (included in Transportation Study Appendix K). The general concept behind the 4D method is that projects that deviate from a base case (in this case, ITE trip generation rates) with respect to the four bulleted variables above exhibit different traffic generation patterns. Elasticities have been derived from travel behavior surveys from the Bay Area to help estimate how traffic generation changes as a function of changes in the 4D's. Those elasticities are used to adjust the base case trip generation to account for the project's density, diversity, and pedestrian/bicycle friendliness (i.e., design) compared to typical suburban developments reflected in the ITE trip generation rates. Applying the 4D method results in a percentage reduction in vehicular traffic generation from the base case (i.e., ITE *Trip Generation*).

This approach was determined to be appropriate by the San Francisco Planning Department because the Project:

- Is located in a relatively isolated area within the City and would redevelop an area comparable in size to a number of entire neighborhoods in other parts of San Francisco;
- Includes residential, employment, retail, and recreational opportunities;
- Follows a development pattern designed to facilitate walking and bicycling for internal trips, and bus service for external trips;
- Proposes street design situated around small, pedestrian-oriented blocks to accommodate a variety of modes of travel; and promote slow and moderate vehicular speeds;
- Locates all homes within a five minute walk of a transit stop; and,
- Proposes to make substantial investments in the transit system within the Project site.

The overall 4D method, as applied to the Project, is detailed in Transportation Study Appendix J, and includes the following steps:

1. Trip Generation: The number of weekday and Sunday person trips generated by the land use program was calculated using the 4D methodology. This process calculates the number of person trips generated by the development and estimates the percentage of those trips that occur internal to the Project area. The remaining external trips are then taken and used in the Project off-site impact analysis.

2. Trip Purpose: The external trips calculated in Step 1 are separated into work and non-work trips, as per *SF Guidelines*.

3. Trip Distribution: Once the trips are calculated by purpose, they are distributed to districts throughout San Francisco and the Bay Area. These districts are defined within the San Francisco CHAMP travel demand forecasting model, maintained by the San Francisco Transportation Authority (SFCTA). To account for more nuanced trip patterns within the City of San Francisco, they were further disaggregated into neighborhoods. This trip distribution calibration was done in consultation with the San Francisco Planning Department, San Francisco Municipal Transportation Agency, and the SFCTA.

4. Transit Mode Utility: Using drive and transit travel times between various districts throughout San Francisco, regression-based utility models were developed for work and non-work trips to determine the relationship between travel time and the cost and transit mode share for each trip type. The 4D model assumed the transit improvements that would be provided as part of Project improvements.

5. Auto and Vehicle Trips: Auto person trips are calculated by subtracting transit trips from all external person trips for each destination zone. The number of vehicle trips was determined based on an average vehicle occupancy of 1.6 persons per vehicle *(assumption based on the 1995 National Personal Transportation Survey).*

6. Trip Assignment: After estimating the transit mode share between the Candlestick Point and Hunters Point Shipyard and each of the districts, the number of transit riders were assigned to specific transit routes serving or proposed to serve the study area.

4.2.2 Project Trips by Mode of Travel

Table 27 presents the daily person trip generation for the Project, the two Project Variants, and the five Alternatives for the Project. The greatest number of daily person trips would occur under Project Variant 1, which assumes the Project development program plus an additional 2,500,000 square feet of R&D space. (Project Variant 1 assumes that the 49ers move to Santa Clara and that a new stadium is not constructed in Hunters Point Shipyard).

Alternative 1, the No Project condition, which assumes buildout of Hunters Point Shipyard Phase I, and would generate the fewest number of total person trips. No development would occur within Candlestick Point. Additional trip generation information for the five Alternatives to the Project is included in Transportation Study Appendix J.

Table 27
Daily Person Trip Generation Summary
Project, Project Variants, and Alternatives to the Project

Scenario	Hunters Point Shipyard	Candlestick Point	Total
Project	65,168	154,483	219,651
Project – Variant 1 (R&D)	81,808	154,483	236,291
Project – Variant 2 (Housing)	77,056	141,933	218,989
Alt. 1 – No Project	44,673	0	44,673
Alt. 2 – No Bridge	65,168	154,483	219,651
Alt. 3 – 49ers at Candlestick	77,056	8,870	85,926
Alt. 4 – Lesser Build	47,680	113,699	161,379
Alt. 5 – No Park Agreement	77,056	141,933	218,989

Note:
Does not include travel demand associated with stadium or arena events. See section 4.2.4.
Source: Fehr & Peers.

Table 28 summarizes the daily, weekday AM and PM peak hour, and Sunday PM peak hour person trip generation for the Project and Project Variants. Project Variant 1 (R&D) would generate the greatest number of peak hour person trips during both the AM and PM peak hours.

Table 28
Person Trip Generation Summary
Project and Project Variants

Scenario	Hunters Point Shipyard	Candlestick Point	Total
Project			
Weekday Daily	65,168	154,483	219,651
Weekday AM	5,834	7,749	13,5583
Weekday PM	6,441	13,971	20,412
Sunday PM	4,839	13,289	18,128
Project – Variant 1 (R&D)			
Weekday Daily	81,808	154,483	236,291
Weekday AM	8,504	7,749	16,253
Weekday PM	8,615	13,971	22,586
Sunday PM	6,430	13,289	19,719
Project – Variant 2 (Housing)			
Weekday Daily	77,056	141,933	218,989
Weekday AM	6,691	6,798	13,489
Weekday PM	7,511	12,848	20,359
Sunday PM	5,773	12,348	18,121

Source: Fehr & Peers.

Table 29 presents trip generation by mode for the weekday AM and PM peak hours, while **Table 28** presents this information for the Sunday PM peak hour. Between 28 and 34 percent of weekday AM and PM peak hour person trips would be internal/linked trips that would remain within the Project site and would occur primarily by walking and bicycling. External trips would occur via auto, transit and bicycle modes; approximately 76 percent of peak hour external trips would occur by auto, 21 percent by transit, and 3 percent by bicycling.

Table 29
Weekday AM and PM Peak Hour Trips By Mode
Project and Project Variants

	Person Trips					Vehicle Trips
	Auto	Transit	Bicycle	Internal /Linked	Total	
WEEKDAY AM PEAK						
Project						
Hunters Point Shipyard	3,078	845	121	1,789	5,833	1,924
Candlestick	3,696	966	144	2,942	7,748	2,310
Total	*6,774*	*1,811*	*265*	*4,731*	*13,581*	*4,234*
Project – Variant 1						
Hunters Point Shipyard	4,904	1,349	193	2,057	8,503	3,065
Candlestick	3,696	966	144	2,942	7,748	2,310
Total	*8,600*	*2,315*	*337*	*4,999*	*16,251*	*5,375*
Project – Variant 2						
Hunters Point Shipyard	3,271	904	129	2,388	6,692	2,044
Candlestick	3,502	904	136	2,257	6,799	2,189
Total	*6,773*	*1,808*	*265*	*4,645*	*13,491*	*4,233*
WEEKDAY PM PEAK						
Project						
Hunters Point Shipyard	3,463	1,001	138	1,839	6,441	2,164
Candlestick	7,861	1,889	302	3,920	13,972	4,913
Total	*11,324*	*2,890*	*440*	*5,759*	*20,413*	*7,077*
Project – Variant 1						
Hunters Point Shipyard	5,014	1,482	201	1,917	8,614	3,134
Candlestick	7,861	1,889	302	3,920	13,972	4,913
Total	*12,875*	*3,371*	*503*	*5837*	*22,586*	*8,047*
Project – Variant 2						
Hunters Point Shipyard	3,739	1,082	149	2,540	7,510	2,337
Candlestick	7,708	1,817	295	3,028	12,848	4,817
Total	*11,447*	*2,899*	*444*	*5,568*	*20,358*	*7,154*

Source: Fehr & Peers.

Table 30 presents the Sunday PM peak hour person trips by mode. On Sundays fewer trips would be internal to the Project area, and fewer trips would occur via transit. On Sundays between 20 and 33 percent of trips would be internal/linked. Of the external trips, between 79 and 82 percent would be by auto, between 15 and 18 percent by transit, and about 3 percent by bicycle mode.

Table 30
Sunday PM Peak Hour Trips By Mode
Project and Project Variants

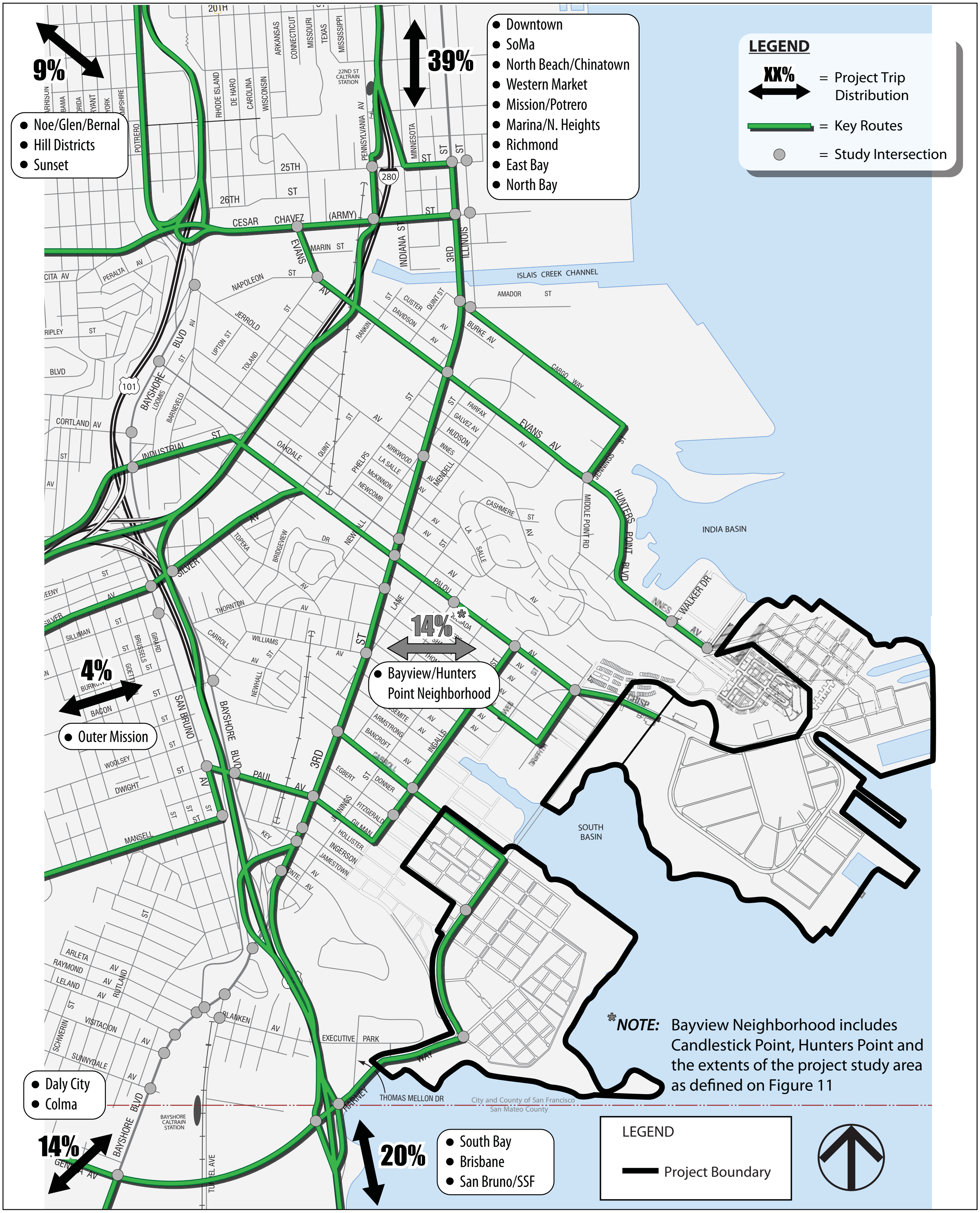
	Person Trips					Vehicle Trips
	Auto	Transit	Bicycle	Internal /Linked	Total	
Project						
Hunters Point Shipyard	2,674	518	99	1,548	4,839	1,666
Candlestick	7,460	1,379	273	4,176	13,288	4,663
Total	*10,134*	*1,897*	*372*	*5,724*	*18,127*	*6,329*
Project – Variant 1						
Hunters Point Shipyard	4,136	814	123	1,356	6,429	2,585
Candlestick	7,280	1,559	273	4,176	13,288	4,550
Total	*11,416*	*2,373*	*396*	*5,532*	*19,717*	*7,135*
Project – Variant 2						
Hunters Point Shipyard	2,765	704	107	2,196	5,772	1,728
Candlestick	7,287	1,538	273	3,250	12,348	4,554
Total	*10,052*	*2,242*	*380*	*5,446*	*18,120*	*6,2,82*

Source: Fehr & Peers.

4.2.3 Project Trip Distribution/Vehicle Assignment

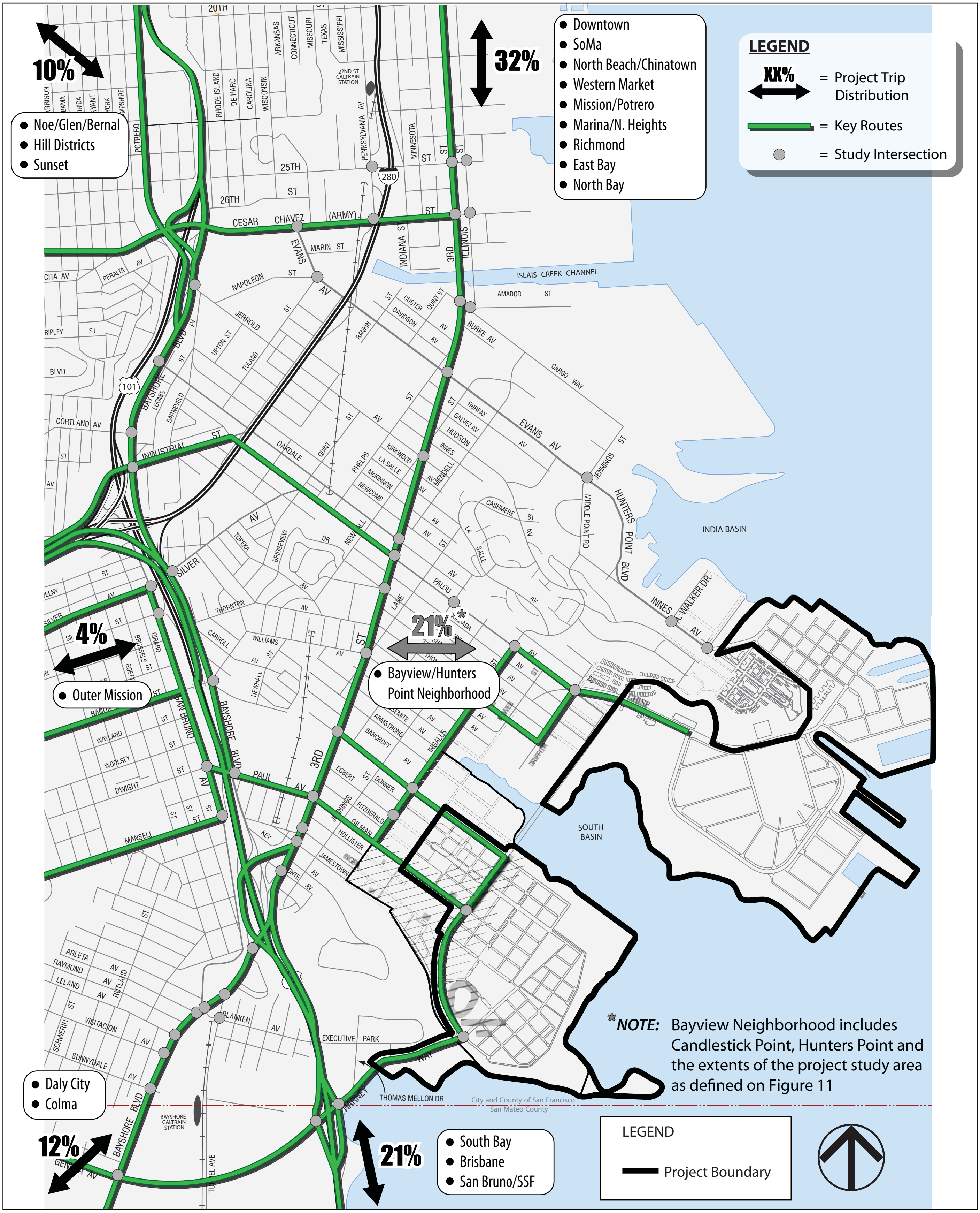
The distribution of the weekday AM and PM transit and vehicle trips to and from San Francisco and areas outside of San Francisco are presented in **Table 31**. The majority of transit trips and about half of vehicle trips would occur within the boundaries of San Francisco, with a greater portion of work trips occurring by transit than non-work trips. Within San Francisco the greatest number of trips would occur between the Project site and Superdistrict 3. Superdistrict 3 is the southeast quadrant of San Francisco and is bounded by the San Mateo County line to the south and the San Francisco Bay to the east, and reaches westward to incorporate the Twin Peaks area. For trips outside of San Francisco, the majority would be to and from nearby Brisbane, Daly City, San Bruno and South San Francisco.

Figure 28 presents the primary assignment routes and distribution percentages for vehicle trips to and from Hunters Point Shipyard, while **Figure 29** presents the routes and distribution percentages for trips to and from Candlestick Point.



SOURCE: Fehr & Peers

FIGURE 28: HUNTERS POINT SHIPYARD TRIP DISTRIBUTION PATTERNS



SOURCE: Fehr & Peers

FIGURE 29: CANDLESTICK POINT TRIP DISTRIBUTION PATTERNS

Table 31
Project Weekday AM and PM Peak Hour Distribution for Vehicles and Transit Trips

	Transit Trips			Vehicle Trips		
	Work	**Non-Work**	**Total**	**Work**	**Non-Work**	**Total**
WEEKDAY AM PEAK						
Downtown CBD	17%	10%	15%	1%	2%	2%
Rest of Superdistrict 1	19%	11%	17%	2%	3%	2%
Superdistrict 2	12%	11%	11%	9%	6%	8%
Superdistrict 3	26%	39%	29%	35%	41%	37%
Superdistrict 4	8%	4%	7%	5%	2%	4%
Total San Francisco	*82%*	*75%*	*79%*	*52%*	*54%*	*53%*
Brisbane, Daly City, Colma, San Bruno, South San Francisco	11%	20%	13%	21%	32%	26%
Rest of South Bay	3%	4%	4%	7%	5%	6%
East Bay	4%	1%	4%	17%	8%	13%
North Bay	0%	0%	0%	3%	1%	2%
TOTAL	***100%***	***100%***	***100%***	***100%***	***100%***	***100%***
WEEKDAY PM PEAK						
Downtown CBD	26%	10%	19%	2%	2%	2%
Rest of Superdistrict 1	23%	11%	18%	3%	3%	3%
Superdistrict 2	11%	11%	11%	10%	6%	8%
Superdistrict 3	18%	40%	27%	28%	44%	38%
Superdistrict 4	5%	5%	5%	4%	3%	3%
Total San Francisco	*83%*	*77%*	*80%*	*47%*	*58%*	*53%*
Brisbane, Daly City, Colma, San Bruno, South San Francisco	10%	18%	13%	22%	30%	27%
Rest of South Bay	3%	4%	4%	8%	5%	6%
East Bay	4%	1%	3%	19%	7%	11%
North Bay	0%	0%	0%	4%	1%	2%
TOTAL	***100%***	***100%***	***100%***	***100%***	***100%***	***100%***

Source: Fehr & Peers.

4.2.4 Stadium and Arena Travel Demand

This section presents the estimates of trip generation, mode split, trip distribution and traffic assignment for the proposed stadium within Hunters Point Shipyard. Travel demand is presented for sellout conditions for a 49er Sunday event, and for a smaller secondary event occurring during a weekday evening. This section also presents the travel demand associated with a sold-out event at the proposed 10,000-seat arena at Candlestick Point.

49ers Game Day Conditions at the Proposed Stadium

Person-Trip Generation

This analysis considers the impacts of sellout games at the stadium, when all 69,000 seats are sold. The number of person-trips made by spectators to the proposed stadium was estimated based on the number of seats proposed for the new stadium, less the average number of "no-shows." Information provided by the San Francisco 49ers indicates that with a 69,000 seat stadium, there would be approximately 3,450 "no-shows" per game (an average 5 percent no-show rate), resulting in an actual attendance of 65,550 for a sellout game. In addition to the 65,550 spectators, the 49ers have indicated that up to 725 game operations/media personnel attend home games, and that approximately 2,610 other game day employees (concessions, security, janitorial, etc.) are on site each game, for a total on-site population of 68,885 people for a sell-out game.

Mode of Travel

Currently, approximately 19 percent of game day spectators arrive to Candlestick Park by public transit, including approximately:

- 6,500 patrons by Muni (11 percent)
- 3,100 patrons by SamTrans (Silverado Stages since 2008), Golden Gate Transit (California Wine Tours since 2009), Valley Transportation Authority (Silverado Stages since 2009), and Tri-Delta Transit (5 percent)[15]
- 1,900 patrons by other private charter service (3 percent)

It was assumed that a modest rise in transit use would occur with the new stadium, especially in light of the new transit service proposed by the Project:

- Harney Way BRT – The new express transit corridor is proposed to run in dedicated bus lanes from the proposed stadium site to key points west and south. This would greatly improve pre-and post-game transit running times as buses would bypass congested traffic conditions on Harney Way. It would also offer efficient and convenient access to regional transit service, such as Caltrain and BART.

- Palou Avenue Transit Preferential Street – On game days Palou Avenue would be a dedicated transit-only street to allow buses to proceed to the T-Third light rail line and points west and north without mixing in congested pre- and post-game traffic.

- Extension of Existing Transit Routes – In addition to operating "game day express" bus routes from strategic locations throughout San Francisco consistent with current game-day operations, the Project's transit plan calls for extending several existing Muni bus routes (the 24-Divisadero, the 44-O'Shaughnessy, and the 48-Quintara-24th Street) to provide regular service into the Project site. This service would be part of the Project's

[15] As noted earlier, game day SamTrans, Golden Gate Transit, and VTA transit service will be replaced by private charter service beginning in the 2009 season. Ridership is expected to remain similar.

regularly scheduled service and would not be special game day service. As a result, patrons would be familiar with the routes.

Due to the dramatic increase in local transit service and improved connectivity to regional transit service, the transit mode share was assumed to increase from 19 percent under existing conditions to 25 percent. Given the extent of transit improvements and demonstrated evidence from other locations that NFL patrons are interested and willing to consider transit as a means to reach games, this increase is a reasonable assumption. This analysis assumes that game operations staff and media personnel would likely use autos. Other game day employees are likely to use transit in a similar fashion as patrons (i.e., 25 percent). **Table 32** summarizes game day travel demand for both spectators and non-spectators.

Table 32
Stadium Game day Attendance - Travel Demand Summary

Spectators	
Total Spectators	69,000
Less 5% No-Shows	*-3,450*
Net Attendance	65,550
Less 25% Transit Usage by Spectators	*-16,388*
Net Auto Person-Trips by Spectators	49,162
Employees/Non-Spectators	
Total Other Employees (Concessions, Security, Etc.)	2,900
Less 10% Other Employee No-Show	*-290*
Net Other Employee Population	2,610
Less 25% Other Employee Transit Usage	*-652*
Net Other Employee Auto Person-Trips	1,958
Total Entertainment/Media/Operations	725
Net Auto Person-Trips by Non-Spectators	2,683

Source: San Francisco 49ers and Fehr & Peers.

Vehicle Occupancy Rates and Vehicle Trip Generation

The average number of spectators in each vehicle is referred to as the vehicle occupancy rate (VOR). Average VORs not only vary by type of vehicle but can also tend to vary depending on the type of stadium seating. For example, existing San Francisco 49ers data indicate that the average VOR for spectators in the club seating sections is 2.0, while the average VOR for spectators in the general seating sections is 3.0.

In order to estimate the number of vehicle-trips under post-game conditions, the number of spectator person-trips was divided by the average VORs. **Table 33** presents auto person-trips generated by various seat types and employees on a typical sellout game, based on the data presented above in **Table 30**, as well as the VORs for the different vehicle types based on existing San Francisco 49ers data, and the resulting number of vehicle trips associated with the new stadium.

Table 33
Stadium Game Day Average VOR[1] by Vehicle Type

	Attendance Type	Auto Person-Trips	Average VOR[1]	Vehicle Trips
Spectators	Club Seat Holder	9,358	2.0	4,679
	Suite Holder	3,606	3.0	1,202
	Hospitality	88	2.0	44
	RVs	220	5.0	44
	Group Sales	39	2.0	20
	Administrative	50	2.0	25
	Players & Families	220	1.0	220
	Owners' Guests	60	1.0	60
	Limousines	50	3.0	17
	General Seating	35,471	3.0	11,824
Spectator Auto Person-Trips		**49,162**	**2.7**	**18,134**
Entertainment/ Operations/ Security/Etc.	Game Operations	225	1.0	225
	Entertainment	60	2.0	30
	Video/Audio	30	1.0	30
	Network	60	1.0	60
	PD, FD, Medical	200	1.0	200
	Media	150	1.0	150
Total Operations/Security Auto Person-Trips		**725**	**1.1**	**695**
Total Other Game day Employees		**2,610**	**1.5**	**1,305**
	Total Game day Travel Demand	***52,497***	***2.6***	***20,134***

Note:
1. VOR – Vehicle occupancy rate.
Source: San Francisco 49ers and Fehr & Peers.

Parking Constraints

The Project would provide 17,415 parking spaces dedicated for game day use. Of this total, 340 spaces adjacent to the stadium would be reserved for buses, and the remaining 17,075 would be for private autos, RVs, limos, etc. Of this total, 16,075 spaces would be adjacent to the stadium and the R & D development, and 1,000 spaces would be provided in Candlestick Point within a parking structure. As a result, 3,059 vehicles of the total unconstrained demand of 20,134 would not be able to park on-site on game days. These vehicles would likely park elsewhere and either walk or take transit into the stadium area. Therefore, although the demand for travel to the project site on game days would be 20,134 vehicles, the actual amount that would park within the project site on game days would be constrained by the 17,075 total parking spaces provided for game day spectators and/or employees.

Departure Patterns

Although the typical end time for a Sunday football game is about 4:00 p.m., there are many factors that influence departure times, including the game score, weather, traffic conditions, and the nature of post-game activities. **Table 34** presents the potential future departure patterns of spectator traffic to reflect the range of conditions likely to occur.

Table 34
Stadium Game Day Post-Game Exit Volumes

Scenario	Assumptions	Peak Hourly Vehicle Exit Demand
Most Conservative	Sold-out event: everyone leaves at end of event	17,075
	Sold-out event: 10% leave early, 5% stay late	14,510
	90% attendance: 10% leave early, 5% stay late	13,060
Average	90% attendance: 15% leave early, 5% stay late	12,290
	80% attendance: 15% leave early, 5% stay late	10,930
	80% attendance: 20% leave early, 5% stay late	10,250
Least Conservative	70% attendance: 20% leave early, 5% stay late	8,960

Note:
1. The Project game day parking supply would be less than the total game day auto travel demand of 20,134 vehicles (including game day employees). There exit demand described above is based on the constrained parking supply of 17,075 vehicles.
2. Although only 20 percent of patrons are shown to depart early in the least conservative scenario, depending on a number of factors, such as weather conditions and game score, the percentage of patrons who leave early may vary substantially from game to game, and may be greater than 20 percent on some occasions.
Source: Fehr & Peers.

An additional factor is the potential synergy after the football game between the stadium and the regional retail development at Candlestick Point, which may result in more spectators electing to stay later than currently do at Candlestick Park. **Table 34** assumes only 5 percent of spectators stay later, which is consistent with the existing stadium departure patterns. Synergies between adjacent attractions may result in higher numbers of patrons arriving earlier or staying late. Regardless, it is likely that the Project's exit routes would continue to function at capacity during the one hour after the end of the game, even with the presence of the nearby retail center and the new stadium location in Hunters Point Shipyard. All transit buses were assumed to leave the Project site during the one hour after the end of the game.

Geographic Distribution

The geographic distribution of spectators was obtained from information provided by the San Francisco 49ers on their season ticket holders. Since a substantial portion of football spectators are season ticket holders, the pattern can be expected to be representative of travel patterns by both season, as well as non-season, ticket holders. The information obtained from the San Francisco 49ers indicates that approximately 40 percent of the season ticket holders reside in the South Bay, 16 percent in the East Bay, 14 percent within San Francisco, and 10 percent in the North Bay counties. The remaining 20 percent reside in locations outside the Bay Area such as the Central Valley and Sacramento, with some living outside of the state.

Secondary (Non-Football) Events at the Proposed Stadium

It is anticipated that other types of events, such as soccer games or concerts, may also be scheduled at the new stadium during the year. A typical secondary event could occur at any time of day and on any day of the week, with an expected crowd ranging from 15,000 (e.g., monster truck rally) to sell-out conditions. For purposes of the transportation analysis, an event with 37,500 spectators was analyzed, which reflects events such as a Metallica concert. Assuming an approximate weekday evening start time of about 7:00 p.m., the weekday PM peak hour (5:00 to 6:00 p.m.) was analyzed for pre-event conditions to address transportation impacts associated with possible secondary events on evening commute traffic conditions. Secondary events would be limited to 20 total occurrences per year.

Trip Generation/Mode Split

Unlike football games, where there would be special transit service to the stadium, it is assumed that for secondary events only regularly scheduled transit service would be provided by Muni and only a small percentage of private charter buses would be expected. Still, the amount of regularly-scheduled transit service serving the new stadium would be substantial, such that transit mode share for a secondary event at the stadium would be approximately 20 percent. It is estimated that the 37,500 spectators would generate about 28,125 persons coming by autos, and 9,375 persons taking transit, including regularly scheduled service and charter buses.

Assuming that the average number of spectators per auto for a secondary event would be similar to that for football spectators in the general seating section (i.e., 3 spectators per auto), the 28,125 persons taking autos would translate to 9,375 vehicles to the stadium, and up to 10,100 vehicles including employees (conservatively estimating similar ratios of employees to spectators as football game days).

Arrival/Departure Patterns

In order to estimate the number of vehicles that would be generated during the weekday PM peak hour (5:00 to 6:00 p.m.), information regarding arrival patterns of non-football events were obtained from a technical paper titled "Understanding the Major Event Traffic Engineering Paradigm", presented in the Institute of Transportation Engineers, 1997 Compendium of Technical Papers. The information contained in this source indicates that approximately 25 percent of the total number of spectators to a non-football event would arrive within the one hour prior to the event start time, 50 percent would arrive within the second hour, and the remaining 25 percent would arrive within the third hour prior to the event start time. As such, about 50 percent, or 4,688 of the spectator vehicles would arrive between 5:00 and 6:00 p.m. for a weekday evening event starting at 7:00 p.m. Employees would arrive earlier to the site.

Geographic Distribution

The geographic distribution of trips associated with a secondary event would vary depending on the event. However, for the purposes of this transportation analysis, it was assumed that the geographic location of the secondary event spectators would be similar to that of the football spectators, where approximately 40 percent would come from the South Bay, 16 percent from the East Bay, 14 percent from within San Francisco, 10 percent from the North Bay, and 20 percent from locations outside of the Bay Area.

Events at the Proposed Arena

The Project also includes a new arena within Candlestick Point that would be used for theater productions, concerts, speaking engagements, educational events, or sporting events. While most events at the arena would be for smaller audiences, the arena would accommodate up to 10,000 attendees. It is anticipated that up to 150 events per year could occur at the arena (e.g., Wednesday, Friday and Saturday every week per year). Similar to the analysis of secondary events at the stadium, assuming an approximate weekday evening start time of 7:00 p.m., the weekday PM peak hour (5:00 to 6:00 p.m.) was analyzed for pre-event conditions to address transportation impacts associated with sold-out events that may occur at the arena. Although no specific program has been developed for events at the arena, sell-out events with 10,000 attendees occurring during weekday evenings would likely be infrequent.

Trip Generation/Mode Split

Similar to the analysis of secondary events at the arena, the analysis of a sold-out event at the arena assumes that only regularly-scheduled transit service would be provided and that only a small number of attendees would arrive by private charter bus. The analysis assumes that 20 percent of attendees would arrive by transit (again, similar to the assumptions for a secondary event at the stadium, and lower than the expected transit ridership to Sunday afternoon 49er games). Therefore, of the 10,000 spectators, 2,000 would be expected to arrive by transit and 8,000 would be expected to arrive via auto. Assuming that the average vehicle occupancy for a sold-out event at the arena would be similar to that of spectators to a 49ers game or for a secondary event at the stadium (i.e., 3 spectators per auto), the 8,000 people arriving via auto would generate an additional 2,667 vehicles to the stadium, and up to 2,860 vehicles including employees (assuming similar ratios of employees to spectators as football game days).

Arrival/Departure Patterns

Arrival and departure patterns for a sold-out event at the arena would likely be similar to those of secondary events at the stadium. Specifically, 50 percent of the attendees, or 1,333 vehicles and 1,000 transit trips, would arrive between 5:00 and 6:00 p.m. for an event that begins at 7:00 p.m. Employees would arrive earlier and would not affect the 5:00 to 6:00 p.m. peak hour.

Geographic Distribution

Similar to secondary events at the stadium, the geographic distribution of trips associated with events at the arena would vary depending on the event. For purposes of this analysis, it was assumed that the geographic location of the attendees would be similar to that of the football spectators, with 40 percent of attendees arriving from the South Bay, 16 percent from the East Bay, 14 percent from within San Francisco, 10 percent from the North Bay, and 20 percent from locations outside the Bay Area.

4.2.5 Parking Demand

The *SF Guidelines* methodology for estimating parking demand was used to calculate the parking demand associated with the land uses for each analysis scenario. For each analysis scenario, parking demand was estimated separately for residential and non-residential uses.

Residential Parking Demand – For individual development projects, residential parking demand is estimated based on the number and type of housing unit (i.e., studios/one bedroom versus two and two-plus bedroom units, and affordable versus market rate housing) that would be constructed.

Non-Residential Parking Demand – Non-residential demand was estimated for both short-term and long-term demand. Long-term demand refers to demand generated by employee trips by auto, while short-term demand refers to demand associated with visitor trips.

Long-term demand was calculated by applying the vehicle mode choice by Project area to the projected number of new employees associated with each land use. Average hour short-term demand was calculated by applying an average turnover of 5.5 vehicles per space to the daily non-work trips by vehicle (one-way trips).

Table 35 presents the residential and non-residential parking demand for the Project, Project Variants and Alternatives. The parking demand calculations are presented in Transportation Study Appendix J.

Table 35
Parking Demand – Project, Project Variants, and Alternatives

Scenario/Project Area	Residential	Non-Residential		Total Demand [1]
	Long Term Demand	Long Term Demand	Short-Term Demand	
Project				
Hunters Point Shipyard	3,110	3,818	996	7,924
Candlestick Point	9,212	1,475	2,622	13,309
Total	*12,322*	*5,293*	*3,618*	*21,233*
Project – Variant 1 (R&D)				
Hunters Point Shipyard	3,110	7,299	1,447	11,856
Candlestick Point	9,212	1,475	2,622	13,309
Total	*12,322*	*8,774*	*4,069*	*25,165*
Project – Variant 2 (Housing)				
Hunters Point Shipyard	4,694	3,811	911	9,416
Candlestick Point	7,627	1,480	2,787	11,894
Total	*12,321*	*5,291*	*3,698*	*21,310*
Alt. 1 - No Project				
Hunters Point Shipyard	2,122	3,929	3,107	9,148
Candlestick Point	--	--	--	--
Total	*2,122*	*3,929*	*3,107*	*9,148*
Alt. 2 – No Bridge				
Hunters Point Shipyard	3,110	3,818	996	7,924
Candlestick Point	9,212	1,475	2,622	13,309
Total	*12,322*	*5,293*	*3,588*	*21,233*
Alt. 3 – 49ers at Candlestick				
Hunters Point Shipyard	4,694	3,810	911	9,415
Candlestick Point	1,420	--	--	1,420
Total	*6,114*	*3,810*	*911*	*10,835*
Alt. 4 – Lesser Build				
Hunters Point Shipyard	2,177	2,717	808	5,702
Candlestick Point	7,627	1,062	2,355	11,044
Total	*9,804*	*3,779*	*3,163*	*16,746*
Alt. 5 – No Park Agreement				
Hunters Point Shipyard	4,694	3,811	911	9,416
Candlestick Point	7,627	1,480	2,787	11,894
Total	*12,321*	*5,291*	*3,698*	*21,310*

Source: CHS Consulting, LCW Consulting.

4.2.6 Loading Demand

The *SF Guidelines* methodology for estimating commercial vehicle and freight loading/loading demand was used to calculate the demand associated with each analysis scenario. Daily truck trips generated per 1,000 square feet were calculated based on the rates contained in the *SF Guidelines*, then converted to hourly demand based on a 9-hour day and a 25-minute average stay. Average hourly demand was converted to a peak hour demand by applying a peaking factor, as specified in the *SF Guidelines*. **Table 36** presents the number of trucks generated on a daily basis, and the demand for loading dock spaces during the peak hour of loading activities. The loading demand calculations are presented in Transportation Study Appendix J.

Table 36
Loading Demand – Project, Project Variants, and Alternatives

Scenario/Project Area	Daily Truck Generation	Peak Hour Loading Dock Space Demand
Project		
Hunters Point Shipyard	713	41
Candlestick Point	507	29
Total	*1,220*	*70*
Project – Variant 1 (R&D)		
Hunters Point Shipyard	1,238	72
Candlestick Point	507	29
Total	*1,745*	*81*
Project – Variant 2 (Housing)		
Hunters Point Shipyard	766	44
Candlestick Point	458	27
Total	*1,224*	*71*
Alt. 1 - No Project		
Hunters Point Shipyard	891	52
Candlestick Point	0	0
Total	*891*	*52*
Alt. 2 – No Bridge		
Hunters Point Shipyard	713	41
Candlestick Point	507	29
Total	*1,220*	*70*
Alt. 3 – 49ers at Candlestick		
Hunters Point Shipyard	766	44
Candlestick Point	53	3
Total	*819*	*47*
Alt. 4 – Lesser Build		
Hunters Point Shipyard	518	30
Candlestick Point	358	21
Total	*876*	*51*
Alt. 5 – No Park Agreement		
Hunters Point Shipyard	766	44
Candlestick Point	458	27
Total	*1,224*	*71*

Source: LCW Consulting.

4.3 FUTURE BASELINE TRANSPORTATION IMPROVEMENTS

In addition to improvements proposed by the Project, the analysis assumes completion of certain planned and reasonably foreseeable roadway and transit improvements in the Project vicinity that, although not part of the Project, could affect circulation. These improvements would be completed by the City and County of San Francisco directly or through development approvals.

4.3.1 Roadway Improvements

Local Roadway Improvements

These improvements were identified as mitigation measures in the EIRs prepared for the Bayview Hunters Point Redevelopment Plan and the Visitacion Valley Redevelopment Plan, and implementation will be assured through conditions of approval placed on the development projects by the Planning Department and the San Francisco Redevelopment Agency.

- **Bayshore/Paul** – At this signalized intersection, as part of the Bayview Hunters Point Redevelopment Plan the signal will be changed from northbound and southbound Bayshore Boulevard operating with permitted left turns (left turns yield to oncoming traffic), to protected left turn movements with an exclusive signal phase.
- **Bayshore/Tunnel** – At this signalized intersection, the Visitacion Valley Redevelopment Plan calls for improvements to the signal timing plan, to redistribute green time from the southbound left turn movement to the northbound/southbound through movements.
- **Bayshore/Arleta/San Bruno** – At this signalized intersection, the Visitacion Valley Redevelopment Plan calls for improvements to the signal timing plan, to redistribute green time from the northbound left turn movement to the southbound through movement.
- **Bayshore/Leland** – At this signalized intersection, the Visitacion Valley Redevelopment Plan calls for improvements to the signal timing plan, to redistribute green time from the northbound left turn movement to the northbound/southbound through movements. As part of this improvement, the westbound approach will be restriped to provide two travel lanes: a left-through lane and an exclusive right-turn lane.
- **Bayshore/Visitacion** – The Visitacion Valley Redevelopment Plan calls for reconfiguration of this signalized intersection to extend the southbound left turn pocket by 80 feet. As part of this improvement, the west-side Bayshore/Leland Muni bus stop would be relocated to the south of Leland Avenue.
- **Bayshore/Sunnydale** – The Visitacion Valley Redevelopment Plan calls for reconfiguration of this signalized intersection to extend the southbound left turn pocket by 100 feet. In addition, the Plan calls for improvements to the signal timing plan, to redistribute green time from the northbound/southbound left turn movements to the eastbound/westbound through movements. The westbound and eastbound approaches

will be restriped to provide two travel lanes: a shared left-through lane and an exclusive right-turn lane.

- **Tunnel/Blanken** – The Visitacion Valley Redevelopment Plan calls for reconfiguration of this intersection to eliminate the all-way STOP-sign controls and install new traffic signal poles, masts and signal heads. In addition, the approaches to the intersection would be restriped to provide for two travel lanes for each approach.
- **Bayshore/Blanken** – At this signalized intersection, the Visitacion Valley Plan calls for restriping of the westbound approach of Blanken Avenue at Bayshore Boulevard to two lanes, to provide for an exclusive left turn lane, and an exclusive right turn lane.
- **Executive Park Improvements** —The Executive Park Property Owners are also required to make local roadway improvements when warranted by poor operating conditions. These include the following short-term and long-term improvements:
  - Signalization of Harney Way/Executive Park Boulevard East
  - Signalization and reconfiguration of Harney Way/Alana Way/Thomas Mellon Drive intersection
  - Widening of Harney Way by one lane
  - Signalization of Executive Park Boulevard West/Alana Way and the restriping of the southbound approach from one shared lane to one exclusive left lane and one exclusive right lane
  - Widening of Alana Way by one lane and two lanes
  - Signalization of Alana Way/Beatty Road

Planned Regional Improvements

Two regional roadway improvement were included as part of the future year analysis. These improvements are currently being designed and analyzed to accommodate the travel demand associated with the areawide projects identified in section 4.1 (**Table 26)** in both San Francisco and San Mateo counties. Implementation of these improvements would be based on fair-share funding measures through inter-jurisdictional study and cooperation, such as the ongoing inter-jurisdictional Bi-County Transportation Study effort led by the San Francisco County Transportation Authority. Within San Francisco, the Planning Department and the Redevelopment Agency will require project developer fair share contributions to these identified funding needs as a condition of development approval or as a condition of any Owner Participation Agreement. These regional roadway improvements are:

- **Geneva Avenue/Harney Way Extension** – Geneva Avenue which currently ends at Bayshore Boulevard, would be extended east to meet Harney Way, improving east-west access in the area. The Geneva Avenue Extension would have three eastbound and three westbound travel lanes between Bayshore Boulevard and a new interchange with U.S.

101. Currently, the nearest east-west access road is Blanken Avenue, which is designed as a neighborhood collector roadway and could not accommodate the additional east-west traffic generated by area projects. The lead agency for this project is the City of Brisbane, with the Caltrans Project Study Report (PSR) expected to be completed in early 2010.Extension from its current terminus at Bayshore Boulevard to a new interchange with U.S. 101.

- **New U.S. 101 Interchange at Geneva/Harney** – In conjunction with the extension of Geneva Avenue east, the existing Harney Way interchange would be redesigned as a typical diamond interchange. Caltrans and the City of Brisbane are the lead agencies for this project, and a PSR report is currently being prepared. Two alternatives are currently being assessed; one with Geneva Avenue/Harney Way crossing under U.S. 101, and one with Geneva Avenue/Harney Way crossing over U.S. 101.

  On the Geneva Avenue/Harney Way crossing of U.S. 101 there would be six lanes eastbound (three left turn lanes and three through lanes) and five lanes westbound (three left turn lanes and three through lanes), for a total of eleven lanes. The intersections of the northbound and southbound ramps with Geneva Avenue/Harney Way would be signalized. For both alternatives, a new bypass to the existing northbound Third Street off-ramp would be constructed, with the intention of diverting traffic on the existing off-ramp from the northbound mainline and improving conditions at the weave section where the new proposed northbound on-ramp from Harney Way would join the mainline. Preliminary drawings for each of the alternatives are included in Transportation Study Appendix L.

4.3.2 Transit Improvements

SFMTA has proposed changes to several of the lines that would serve the study area as part of its Transit Effectiveness Project (TEP). The TEP is a comprehensive review of Muni operations, with numerous proposals for service and street network changes to address issues related to reliability, travel times and service areas. Service planning changes are budget-neutral, while additional funding will be required for capital needs (e.g., additional buses). SFMTA will pursue Proposition K funds and federal grants for capital funding. The changes affecting the study area include:

- Eliminating 19-Polk service to the Hunters Point Shipyard.
- Increasing frequency on the 24-Divisadero from 8.5 minutes in the AM peak hour and 10 minutes in the PM peak hour to 7.5 minutes in the AM and PM peak hours.
- Increasing frequency on the 44-O'Shaughnessey to 6 minutes in the PM peak hour.
- Increasing frequency on the 54-Felton from 30 minutes to 20 minutes in the AM and PM peak hours.

- Extending the 48-Quintara-24th Street would be extended from 25th Street and Connecticut Street in Potrero Hill into the Hunters Point Shipyard in order to offset the elimination of the 19-Polk service to Hunters Point Shipyard. Frequencies on the 48-Quintara-24th Street would be reduced from 12 minutes to 15 minutes in the AM and PM peak hours.
- Rerouting and extending the 28L-19th Avenue Limited from its current terminus at the Daly City BART station up to Geneva Avenue, terminating just east of Mission Street. The 28L-19th Avenue Limited would maintain its current 10-minute frequency in the AM and PM peak hours.
- Extending/rerouting the T-Third light rail line north of the station at Fourth and King Streets. Currently the T-Third continues north along The Embarcadero, entering the Market Street subway just north of Folsom Street. As described earlier, as part of the Central Subway project, beginning in approximately year 2016, the T-Third line will continue north on Fourth Street, entering a new subway under Fourth Street just south of Harrison Street. The new terminus will be in Chinatown, underneath Stockton Street. The Central Subway operating plan calls for single-car trains at 7.5-minute frequencies during peak hours between Chinatown and Bayview, as well as a two-car short-line train between Chinatown and Mariposa Street operating at 7.5-minute frequencies.

While not included in the assumptions for future transit conditions, the objectives of the ongoing Bayshore Intermodal Station Access Study would complement the TEP improvements, as well as Project transit improvements. The SFCTA is conducting the Bayshore Intermodal Station Access Study to develop multi-jurisdictional consensus around a vision and conceptual design for new intermodal transit connections and passenger access to the Bayshore Caltrain Station. Multiple planning processes are proceeding to develop projects that would connect new transit services to the Bayshore Station, including an extension of the T-Third light rail line from its current nearby terminus, the extension of the BRT line to Hunters Point Shipyard, and a new local street connection across Bayshore Boulevard, the Caltrain tracks, and U.S. 101 as a Geneva Avenue extension. The SFCTA is partnering with stakeholder agencies to develop the proposed station connections in a seamless fashion and to promote strong multimodal access to the station. The end result will be a set of conceptual designs for the station and the new connections to serve as a vision that the individual projects will implement as they progress through their planning and preliminary engineering phases.

4.3.3 Bicycle Improvements

The certification of the San Francisco Bicycle Plan Final EIR was affirmed by the Board of Supervisors in August 2009. The San Francisco Bicycle Plan identifies near-term improvements that could be implemented within the next five years, as well as policy goals, objectives and actions to support these improvements. It also includes long-term improvements, and minor improvements that would be implemented to facilitate bicycling in San Francisco. The injunction to stop implementation of the Bicycle Plan improvements that was issued on June 2006 by the Superior Court of California would be lifted, and that implementation of near-term improvements would be contracted. Funds for Bicycle Plan improvements would be available from the State Bicycle Transportation Account and San Francisco Measure C funding. The SFMTA, the San Francisco Recreation and Park Department (RDP), or the San Francisco Department of Public Works (under the direction of SFMTA or RPD), would implement improvements, depending on which entity has jurisdiction. The *San Francisco Bicycle Plan* includes six short-term projects within the study area (see **Figure 21**):

- San Francisco Bicycle Plan Project 4-2: Cargo Way Bicycle Lanes, will involve the installation of Class II bicycle lanes in both directions on Cargo Way between Third Street and Jennings Street. On-street parking on the south side of Cargo Way will be removed, and a Class II left-turn bicycle lane will be installed on eastbound Cargo Way approaching Illinois Street and Amador Street. Cargo Way is not currently part of the citywide bicycle route network.
- San Francisco Bicycle Plan Project 4-3: Illinois Street Bicycle Lanes, would involve the installation of Class II bicycle lanes in both directions on Bicycle Route #5 on Illinois Street between 16th Street and Cargo Way. On-street parking on the east side of Illinois Street north of 22nd Street will be removed, and additional on-street parking spaces will be provided on Tennessee Street, 22nd Street, and 24th Street.
- San Francisco Bicycle Plan Project 4-4: Innes Avenue Bicycle Lanes, will involve the installation of Class II or Class III bicycle facilities in both directions on Bicycle Route #68 on Innes Avenue between Donahue Street and Hunters Point Boulevard. Two options have been identified for this segment and a preferred option was not included in the Bicycle Plan Final EIR: Option 1 would add Class II bicycle lanes in both directions, and remove on-street parking on the south side of Innes Avenue between Hunters Point Boulevard and Earl Street, and on both sides of Innes Street between Earl Street and Donahue Street. Option 2 would be similar to Option 1, except for the segment from Hunters Point Boulevard to Earl Street, where sharrows would be added to the existing Class III bicycle route in both directions. There would be no parking or travel lane removals associated with Option 2 between Hunters Point Boulevard and Earl Street.
- San Francisco Bicycle Plan Project 5-4: Bayshore Boulevard Bicycle Lanes, will involve the installation of Class II bicycle lanes in both directions of travel along most of Bayshore Boulevard between Cesar Chavez Street and Silver Avenue (Bicycle Route #25). Sharrows would be added in each direction between Cesar Chavez Street and approximately the beginning of the couplet split (i.e., at Jerrold Avenue). On-street parking will be removed on both sides of Bayshore Boulevard from the couplet split to Industrial Street, and one northbound lane will be removed beginning midblock between Helena and Industrial Streets. Sharrows will be added on northbound Bayshore Boulevard to Oakdale Avenue, Loomis Street, Barnveld Avenue and Jerrold Avenue, and

the northbound curbside bicycle lane from Helena Street to Marengo Street will be a shared transit and bicycle lane.

- San Francisco Bicycle Plan Project 5-5: Cesar Chavez Bicycle Lanes, will involve the installation of Class II bicycle lanes in both directions on Bicycle Route #25 on Cesar Chavez Street between Kansas Street (near U.S. 101) and Mississippi Street (near I-280). To accommodate the bicycle lanes, one of the two eastbound travel lanes will be removed.
- *San Francisco Bicycle Plan* Project 5-13: San Bruno Bicycle Lanes will involve the installation of Class II bicycle lanes in both directions on Bicycle Route #25 on San Bruno Avenue between Silver Avenue and Paul Avenue. To accommodate the bicycle lanes, on-street parking would need to be removed in the segment between Silliman Street and Silver Avenue.

The Bicycle Plan includes 24 long-term improvements that are proposed to be designed and implemented citywide over time. These improvements would complete the bicycle route network envisioned in the Bicycle Plan, close network gaps, refine and rationalize the bicycle route network, and improve safety and the bicyclists experience. Five long-term improvements have been identified within the study area for further design, environmental review and possible implementation. With the exception of the Bay Trail improvements which involve construction of a Class I off-street path, and Mendell Street which is currently a plaza, the long-term improvements generally involve implementation of Class II or Class III bicycle facilities. Design of these improvements would occur within the context of the bicycle route network, planned development characteristics, and roadway network configuration at the initiation of the design and review process for each improvement. The five long term improvements include:

- Long-Term Improvement L-3: Bay Trail Improvements in the vicinity of Hunters Point
- Long-Term Improvement L-4: Bayview Transportation Improvements Project
- Long-Term Improvement L-11: Industrial St between Loomis St and Oakdale Ave
- Long-Term Improvement L-12: Jennings St between Cargo Way and Evans Ave
- Long-Term Improvement L-15: Mendell St between Oakdale Ave and Palou Ave

4.4 SIGNIFICANCE CRITERIA

The City and Agency have not formally adopted significance standards for impacts related to transportation, but generally consider that implementation of the Project would have significant impacts on these resources if it were to:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)

- Exceed, either individually or cumulatively, an LOS standard established by the county congestion management agency for designated roads or highways (unless it is practical to achieve the standard through increased use of alternative transportation modes)
- Result in a change in air traffic patterns, including either an increase in traffic levels, obstructions to flight, or a change in location, that causes substantial safety risks
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses
- Result in inadequate parking capacity that could not be accommodated by alternative solutions
- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., conflict with policies promoting bus turnouts, bicycle racks, etc.), or cause a substantial increase in transit demand that cannot be accommodated by existing or proposed transit capacity or alternative travel modes

The transportation and circulation impact findings herein are also based on the following significance criteria used by the San Francisco Planning Department for the determination of impacts associated with a proposed project.

- Traffic – In San Francisco, the threshold for a significant adverse impact on traffic has been established as deterioration in the LOS at a signalized intersection from LOS D or better to LOS E or LOS F, or from LOS E to LOS F. The operational impacts on unsignalized intersections are considered potentially significant if project-related traffic causes the level of service at the worst approach to deteriorate from LOS D or better to LOS E or LOS F and Caltrans signal warrants would be met, or causes Caltrans signal warrants to be met when the worst approach is already at LOS E or LOS F.[16]

  For an intersection that operates at LOS E or LOS F under existing conditions, there may be a significant adverse impact depending upon the magnitude of the project's contribution to the worsening of delay. In addition, a project would have a significant adverse effect if it would cause major traffic hazards, or would contribute considerably to the cumulative traffic increases that would cause the deterioration in LOS to unacceptable levels (i.e., to LOS E or LOS F).

  The operational impacts on freeway mainline segments and freeway on-ramp merge and off-ramp diverge operations are considered significant when project-related traffic causes the level of service to deteriorate from LOS D or better to LOS E or LOS F, or from LOS

[16] Five of the study intersections are within the City of Brisbane. The level of service standard for all arterial streets within the City of Brisbane is LOS D, except for the intersections on Bayshore Boulevard at Old County Road and San Bruno Avenue, which shall not be less than LOS C.

E to LOS F. In addition, a project would have a significant effect on the environment if it would contribute substantially to congestion at unacceptable levels.

- Parking – Parking supply is not considered to be a part of the permanent physical environment in San Francisco[17]. Parking conditions are not static, as parking supply and demand varies day to night, day to day, 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 § 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. 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."

  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.

- Transit – 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 operating costs or delays such that significant adverse impacts in transit service levels could result.

[17] 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 Project, including land, air, water, minerals, flora, fauna, noise and objects of historic or aesthetic significance."

The project would also have a significant effect on the environment if it would increase transit travel times on a particular route such that existing (or proposed) headways could not be maintained based on the existing (or proposed) vehicle fleet.

- Pedestrians – 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.
- Bicycles – 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.
- Loading – 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.
- Emergency Vehicle Access – The project would have a significant impact on the environment if it would hinder emergency vehicle access.
- Construction – Construction-related impacts generally would not be considered significant due to their temporary and limited duration. However, in circumstances involving large development plans where construction would occur over long periods of time, construction-related impacts may be considered significant.

Project impacts were assessed by comparing future year 2030 conditions with the Project to 2030 No Project conditions. The 2030 No Project condition includes development within Hunters Point Shipyard associated with approved Phase I, as well as buildout of the existing Hunters Point Shipyard Redevelopment Plan, which would be replaced by the Project. However, for purposes of defining and assessing effectiveness of proposed mitigation measures, the total effect of the Project was considered (i.e., total vehicle, transit, bicycle and pedestrian trips generated by the Project were considered, not just the increase from the 2030 No Project condition which assumes development within the Hunters Point Shipyard component of the Project). Further, for purposes of determining the Project's contribution to cumulative impacts, the total Project effect was considered.

The Project was determined to have a significant traffic impact at an intersection if Project-generated trips would cause an intersection operating at LOS D or better under 2030 No Project conditions to operate at LOS E or LOS F, or intersections operating at LOS E under 2030 No Project conditions to deteriorate to LOS F conditions. At intersections that would operate at LOS E or LOS F under 2030 No Project conditions, and would continue to operate at LOS E or LOS F under Project conditions, the increase in Project vehicle trips were reviewed to determine whether the increase would contribute considerably (i.e., five percent or more) to critical movements operating at LOS E or LOS F.

For freeway mainline and ramp analyses, locations where the Project would result in a change from LOS D or better under 2030 No Project conditions to LOS E or LOS F, or from LOS E or LOS F, with the Project are identified as Project impacts. At locations that would operate at LOS E or LOS F under 2030 No Project conditions, and would continue to operate at LOS E or LOS F under Project conditions, the Project trips, as a percentage of total traffic volumes on the facility were reviewed to determine whether the increase would contribute considerably (i.e., five percent or more) to total volumes on the facility.

The Project was determined to have a significant impact if it would increase transit travel times such that additional transit vehicles would be required to maintain the proposed headways. This was assumed to be the case if either the Project's travel time increases to a particular route would be greater than ½ its proposed headway or if the number of required vehicles estimated using SFMTA's cost/scheduling model, which takes into account scheduled breaks and extra time built into schedules, increases by one or more vehicles with the addition of the Project characteristics. The Project would have a significant contribution to a cumulative impact if it was determined to have a significant Project impact. In a few circumstances, although no Project impact was identified, the Project contribution to the cumulative scenario was determined to be considerable when a transit line travels through intersections that would operate at LOS E or LOS F due to Project traffic.

Chapter 5
YEAR 2030 NO PROJECT CONDITIONS

This chapter presents the year 2030 No Project (without the Project development program, but assumes the approved development for HPS Phase I) conditions, and compares the analysis results to existing conditions, as presented in Chapter 3. The 2030 No Project condition represents the cumulative baseline condition for the impact analysis. Comparison to existing conditions was conducted to determine whether the 2030 No Project scenario would have significant cumulative impacts due to background development anticipated in the project study area, regardless of any Project development scenario. In Chapter 6, the Project, Project Variants, and Project Alternatives are compared to the 2030 No Project conditions to determine the impacts of the Project.

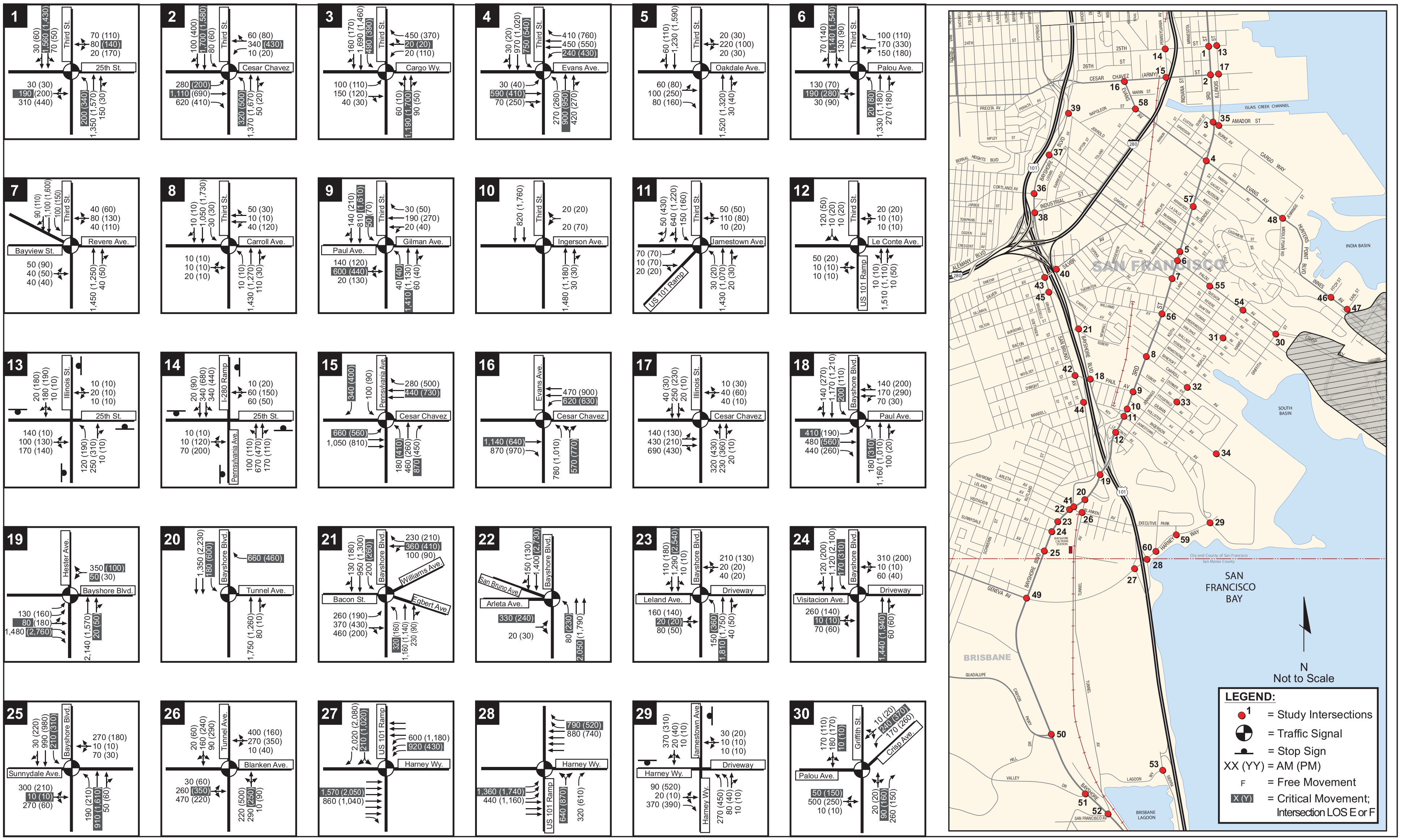
Under the 2030 No Project conditions, the vicinity of the Project is anticipated to experience growth of about 7,000 new housing units, and about 9.8 million square feet (see **Table 26** in Chapter 4) of development. The remainder of San Francisco is also projected to experience an increase in both jobs and housing units. Within the rest of San Francisco, total daily person trips via all modes are projected to increase by about 14 percent over existing conditions, and the total daily vehicle trips are projected to increase by about 8 percent over existing conditions. (SF-CHAMP, 2009)

5.1 TRAFFIC IMPACTS

5.1.1 Intersection Operations

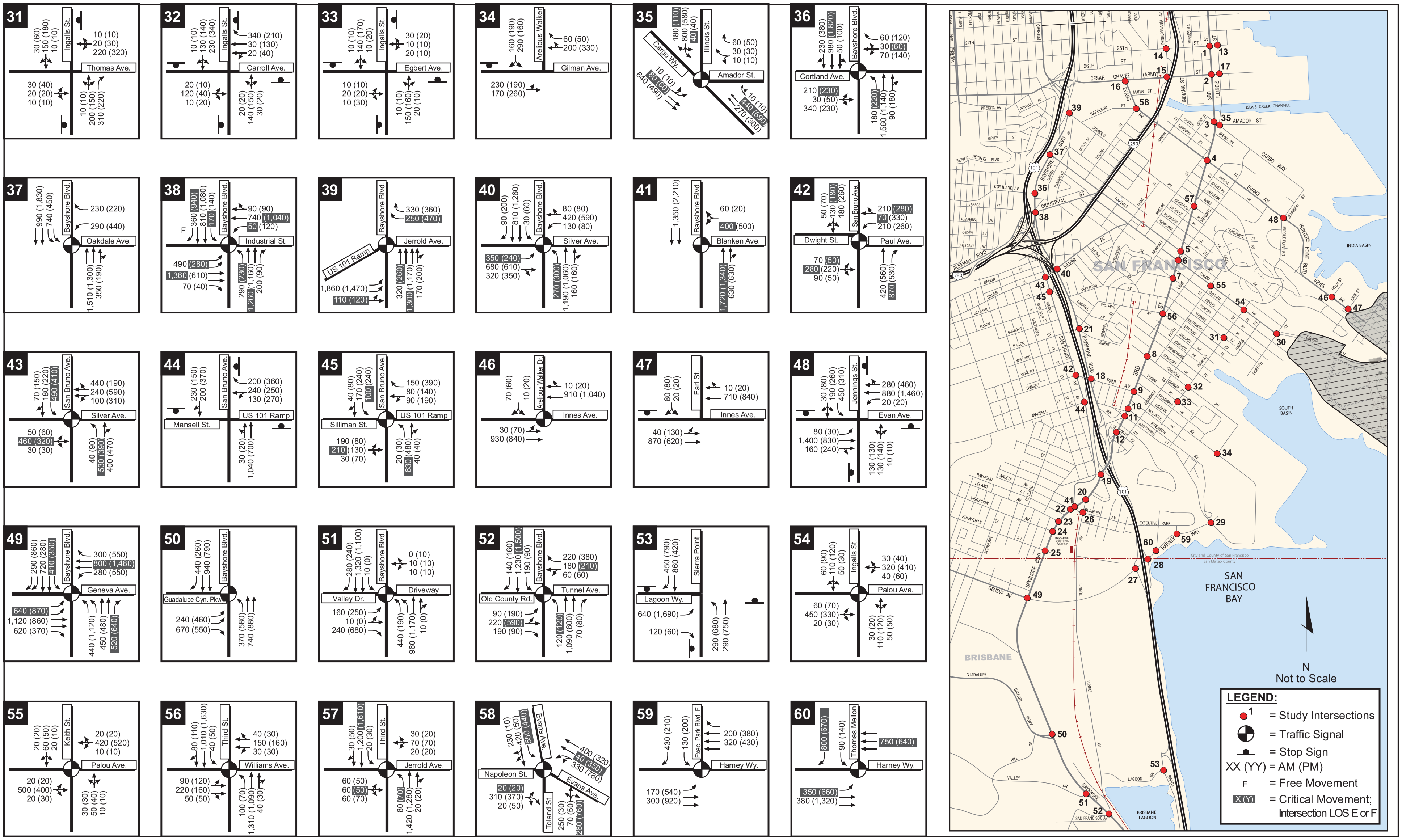
Future year 2030 No Project traffic volumes at the 60 study intersections are presented on **Figure 30A** and **Figure 30B** for the weekday AM and PM peak hours, and on **Figure 30C** and **Figure 30D** for the Sunday PM peak hour conditions. Transportation Study Appendix E contains intersection turning movement volume summaries.

Table 37 presents a comparison of the weekday AM and PM peak hour intersection LOS analysis for the existing and 2030 No Project conditions. **Table 38** presents this comparison for Sunday PM peak hour conditions. As traffic volumes in the study area are anticipated to increase as a result of development in the area and within San Francisco, average vehicle delays at both signalized and unsignalized intersections would increase, and operating conditions would become more constrained.



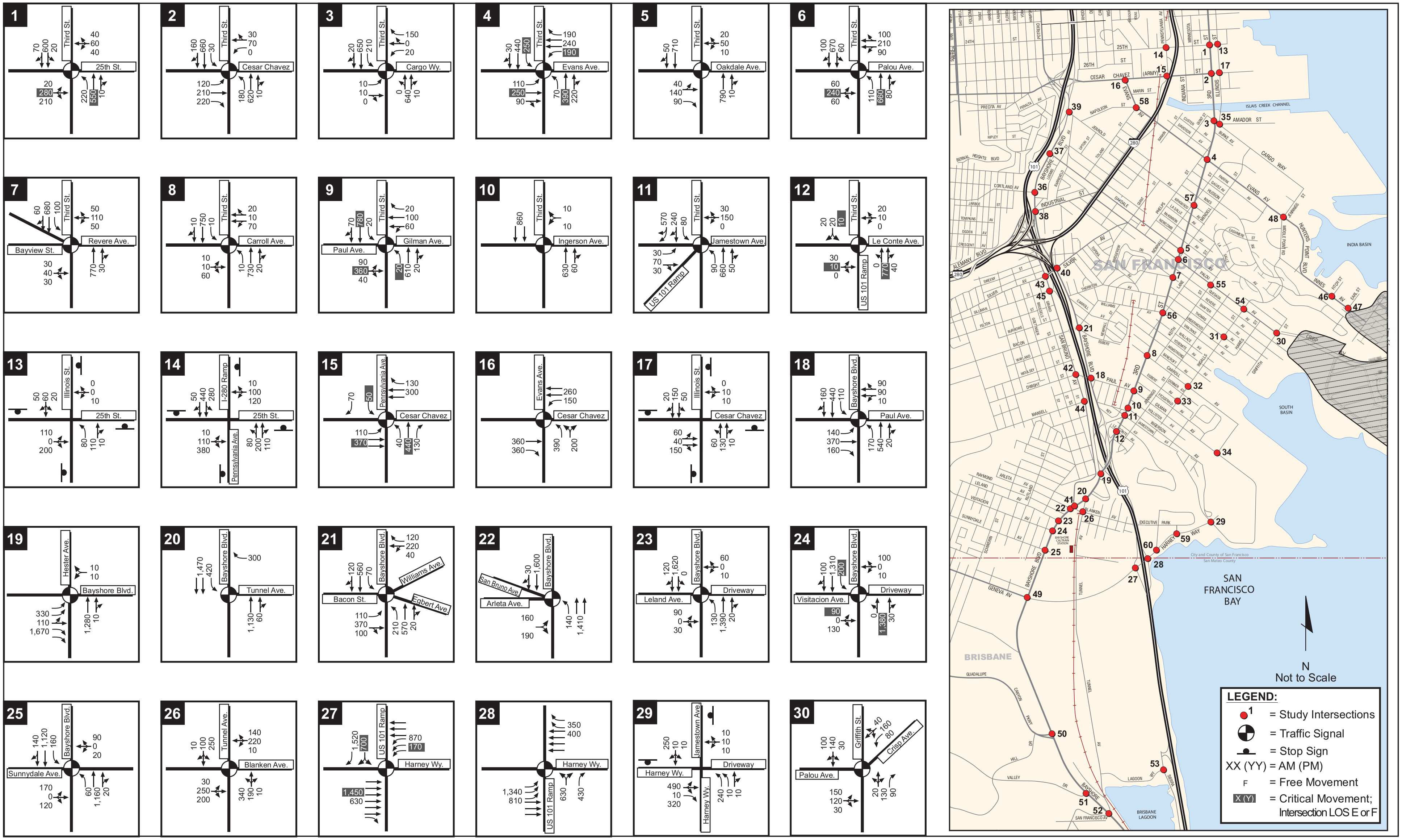
NO PROJECT WEEKDAY PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 30A



NO PROJECT
PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS

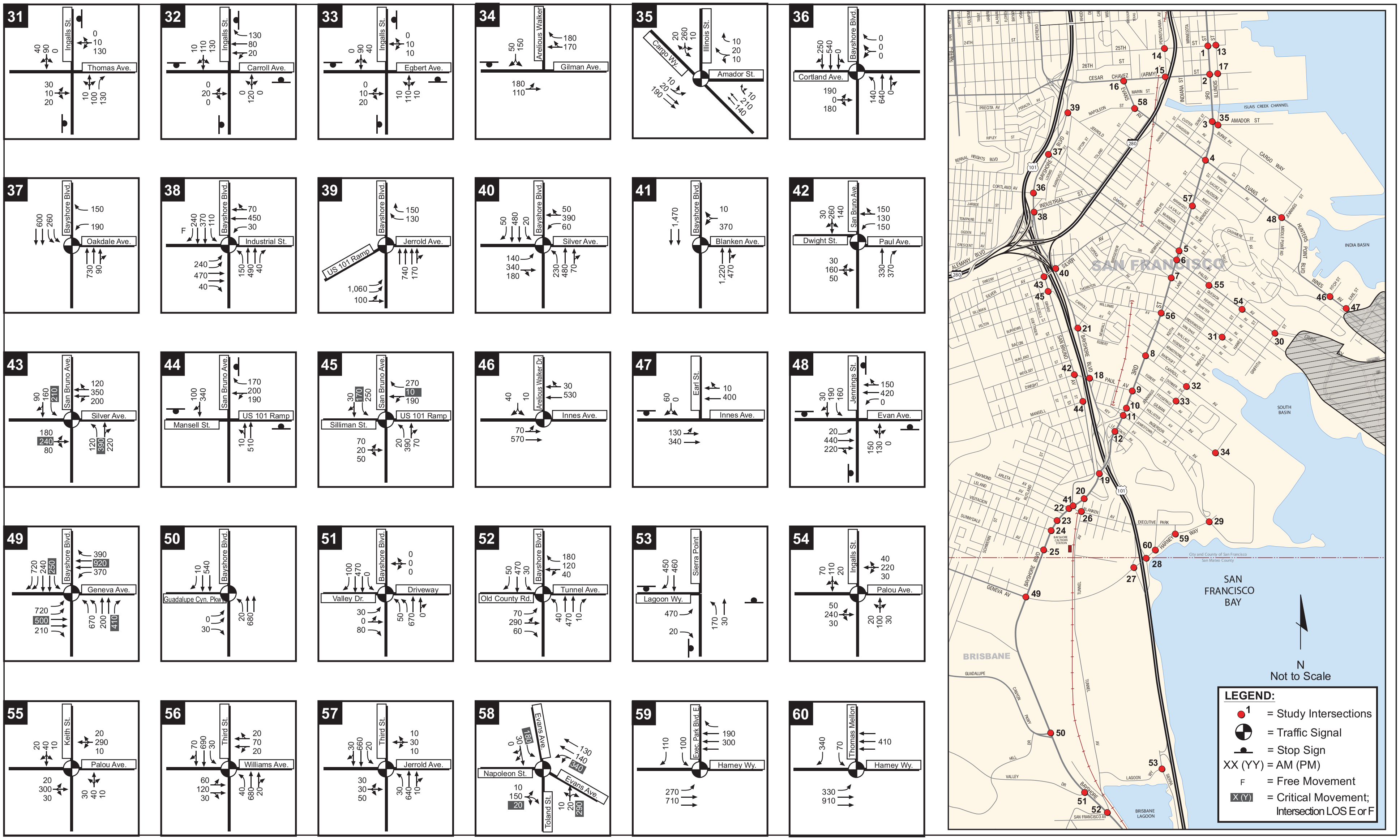
FIGURE 30B



CP-HPS Phase II Development Plan Transportation Study

NO PROJECT SUNDAY PM PEAK HOUR
(NO FOOTBALL GAME) TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 30C



CP-HPS Phase II Development Plan Transportation Study

NO PROJECT SUNDAY PM PEAK HOUR (NO FOOTBALL GAME) TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 30D

Table 37
Intersection LOS
Existing and 2030 No Project Conditions – Weekday AM and PM Peak Hours

	Intersection	AM Peak Hour				PM Peak Hour			
		Existing		2030 No Project		Existing		2030 No Project	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS
1	Third St/25th St	14	B	**>80**	**F**	16	B	**>80**	**F**
2	Third St/Cesar Chavez St	36	D	**>80**	**F**	31	C	**>80**	**F**
3	Third St/Cargo Way	23	C	**>80**	**F**	20	B	**>80**	**F**
4	Third St/Evans Ave	35	C	**>80**	**F**	34	C	**>80**	**F**
5	Third St/Oakdale Ave	17	B	21	C	19	B	30	C
6	Third St/Palou Ave	15	B	**>80**	**F**	30	C	**>80**	**F**
7	Third St/Revere Ave	19	B	35	D	31	C	37	D
8	Third St/Carroll Ave	12	B	12	B	14	B	14	B
9	Third St/Paul Ave	27	C	**>80**	**F**	24	C	**>80**	**F**
10	Third St/Ingerson Ave	5	A	5	A	5	A	7	A
11	Third St/Jamestown Ave	13	B	29	C	14	B	30	C
12	Third/Le Conte/US 101 nb off	11	B	50	D	11	B	24	C
13	25th St/Illinois St	7	A	14	B	7	A	14	B
14	25th St/Pennsylvania Ave	9	A	26	D	12	B	**>80**	**F**
15	Cesar Chavez/Penns/I-280	**78**	**E**	**>80**	**F**	39	D	**>80**	**F**
16	Cesar Chavez St/Evans Ave	21	C	**>80**	**F**	21	C	**>80**	**F**
17	Cesar Chavez St/Illinois St	13	B	25	C	19	A	22	C
18	Bayshore Blvd/Paul Ave	21	C	**61**	**E**	17	B	**>80**	**F**
19	Bayshore/Hester/US 101 sb off	28	C	**>80**	**F**	13	B	**>80**	**F**
20	Bayshore Blvd/Tunnel Ave	19	B	**>80**	**F**	16	B	**>80**	**F**

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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.**

Source: Fehr & Peers.

Table 37 (continued)
Intersection LOS
Existing and 2030 No Project Conditions – Weekday AM and Peak Hours

	Intersection	AM Peak Hour				PM Peak Hour			
		Existing		2030 No Project		Existing		2030 No Project	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS
21	Bayshore Blvd/Bacon St	**76**	**E**	**>80**	**F**	22	C	**>80**	**F**
22	Bayshore Blvd/Arleta St	25	C	**>80**	**F**	25	C	**>80**	**F**
23	Bayshore Blvd/Leland Ave	21	C	**>80**	**F**	22	B	**>80**	**F**
24	Bayshore Blvd/Visitacion Ave	17	B	**>80**	**F**	15	B	**>80**	**F**
25	Bayshore Blvd/Sunnydale Ave	20	C	**>80**	**F**	19	B	**>80**	**F**
26	Tunnel Ave/Blanken	11	B	43	D	9	A	**>80**	**F**
27	Alana Way/Beatty Ave [3]	10	A	**>80**	**F**	9	A	**>80**	**F**
28	Alana Way/Harney Way/Mellon [3]	8	A	**>80**	**F**	8	A	**>80**	**F**
29	Harney Way/Jamestown Ave	8	A	12	B	8	A	**40**	**E**
30	Crisp Ave/Palou Ave	11.4 (nb)	B	**57**	**E**	11.6(nb)	B	**58**	**E**
31	Ingalls St/Thomas Ave	11.3(wb)	B	19.0(wb)	C	11.5(wb)	B	27.9(wb)	C
32	Ingalls St/Carroll Ave	8	A	15	B	8	A	17	C
33	Ingalls St/Egbert Ave	8	A	8	A	8	A	9	A
34	A.Walker/Gilman Ave [4]	9.1(sb)	A	**>50 (eb)**	**F**	9.2(sb)	A	**>50(eb)**	**F**
35	Amador St/Cargo Way	28	C	**65**	**E**	24	C	**60**	**E**
36	Bayshore Blvd/Cortland Ave	19	B	37	D	25	C	**>80**	**F**
37	Bayshore Blvd/Oakdale Ave	30	C	43	D	26	C	33	C
38	Bayshore/Alemany/Industrial	44	D	**>80**	**F**	**58**	**E**	**>80**	**F**
39	Bayshore/US 101 nb off to Cesar	43	D	**74**	**E**	48	D	**>80**	**F**
40	Bayshore Blvd/Silver Ave	50	D	**>80**	**F**	50	D	**>80**	**F**

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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.**
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
Source: Fehr & Peers.

Table 37 (continued)
Intersection LOS
Existing and 2030 No Project Conditions – Weekday AM and PM Peak Hours

#	Intersection	AM Peak Hour				PM Peak Hour			
		Existing		No Project		Existing		2030 No Project	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS
41	Bayshore Blvd/Blanken Ave	12	B	**>80**	**F**	11	B	**>80**	**F**
42	San Bruno Ave/Paul Ave	20	B	**>80**	**F**	20	B	**>80**	**F**
43	San Bruno Ave/Silver Ave	**75**	**E**	**>80**	**F**	46	D	**>80**	**F**
44	San Bruno/Mansell/101 sb off	17	C	**>50**	**F**	33	D	**>50**	**F**
45	San Bruno/Silliman/101 sb off	24	C	**>80**	**F**	20	B	38	D
46	Innes Ave/A.Walker Drive	8.6(sb)	A	5	A	8.7(sb)	A	5	A
47	Innes Ave/Earl St	8.5(sb)	A	17.3(sb)	C	8.6(sb)	A	23.1(sb)	C
48	Evans Ave/Jennings St	9	A	**>80**	**F**	10	A	**>80**	**F**
49	Bayshore Blvd/Geneva Ave	24	C	**>80**	**F**	25	C	**>80**	**F**
50	Bayshore/Guadalupe Pkwy	16	B	21	C	14	B	50	D
51	Bayshore Blvd/Valley Dr	23	C	20	C	16	B	40	D
52	Bayshore Blvd/Old County Rd	28	C	40	D	29	C	**>80**	**F**
53	Sierra Pt/Lagoon Way	12	B	**>50**	**F**	16	B	**>50**	**F**
54	Ingalls St/Palou Ave	9	A	16	B	9	A	16	B
55	Keith St/Palou Ave	9	A	10	A	9	A	8	A
56	Third/Williams/Van Dyke	22	C	18	B	22	C	17	B
57	Third St/Jerrold Ave	22	C	49	D	23	C	**>80**	**F**
58	Evans/Napoleon/Toland	37	D	**>80**	**F**	46	D	**>80**	**F**
59	Harney/Executive Park East	9.1 (sb)	A	25	C	8.9 (sb)	A	25	C
60	Harney/Thomas Mellon	--	--	30	C	--	--	19	B

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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.**
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
Source: Fehr & Peers.

Table 38
Intersection LOS
Existing and 2030 No Project Conditions – Sunday PM Peak Hour

Intersection		Existing		2030 No Project	
		Delay [1]	LOS [2]	Delay	LOS
1	Third St/25th St	13	B	**63**	**E**
2	Third St/Cesar Chavez St	23	C	31	C
3	Third St/Cargo Way	17	B	30	C
4	Third St/Evans Ave	32	C	**57**	**E**
5	Third St/Oakdale Ave	15	B	14	C
6	Third St/Palou Ave	29	C	**>80**	**F**
7	Third St/Revere Ave	22	C	20	B
8	Third St/Carroll Ave	9	A	10	B
9	Third St/Paul Ave	21	C	**64**	**E**
10	Third St/Ingerson Ave	3	A	3	A
11	Third St/Jamestown Ave	21	C	24	C
12	Third/Le Conte/US 101 nb off	12	B	14	B
13	25th St/Illinois St	7	A	10	A
14	25th St/Pennsylvania Ave	10	A	**45**	**E**
15	Cesar Chavez/Penns/I-280	28	C	**61**	**E**
16	Cesar Chavez St/Evans Ave	15	B	18	B
17	Cesar Chavez St/Illinois St	14	A	18	B
18	Bayshore Blvd/Paul Ave	12	B	14	B
19	Bayshore/Hester/US 101 sb off	14	B	14	B
20	Bayshore Blvd/Tunnel Ave	8	A	53	D
21	Bayshore Blvd/Bacon St	12	B	17	B
22	Bayshore Blvd/Arleta St	24	C	54	D
23	Bayshore Blvd/Leland Ave	18	B	41	D
24	Bayshore Blvd/Visitacion Ave	15	B	**64**	**E**
25	Bayshore Blvd/Sunnydale Ave	19	B	55	D
26	Tunnel Ave/Blanken	8	A	30	C
27	Geneva/U.S. 101 SB ramps [3]	8	A	**>80**	**F**
28	Harney/U.S. 101 NB ramps [3]	9	A	54	D
29	Harney Way/Jamestown Ave	7	A	22	C
30	Crisp Ave/Palou Ave	11.1(sb)	B	37	D

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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.**
Source: Fehr & Peers.

Table 38 (continued)
Intersection LOS
Existing and 2030 No Project Conditions – Sunday PM Peak Hour

Intersection		Existing		2030 No Project	
		Delay [1]	LOS [2]	Delay	LOS
31	Ingalls St/Thomas Ave	9.9(wb)	A	11.8 (wb)	B
32	Ingalls St/Carroll Ave	7	A	9	A
33	Ingalls St/Egbert Ave	7	A	8	A
34	A.Walker/Gilman Ave	8.9(sb)	A	**>50 (eb)**	**F**
35	Amador St/Cargo Way	28	B	21	C
36	Bayshore Blvd/Cortland Ave	17	B	23	C
37	Bayshore Blvd/Oakdale Ave	24	C	21	C
38	Bayshore/Alemany/Industrial	35	C	40	D
39	Bayshore/US 101 nb off to Cesar	25	C	25	C
40	Bayshore Blvd/Silver Ave	15	B	19	B
41	Bayshore Blvd/Blanken Ave	9	A	51	D
42	San Bruno Ave/Paul Ave	16	B	39	D
43	San Bruno Ave/Silver Ave	41	D	**>80**	**F**
44	San Bruno/Mansell/US 101 sb off	16	C	27	D
45	San Bruno/Silliman/US 101 sb off	17	B	**78**	**E**
46	Innes Ave/A.Walker Drive	8.5(sb)	A	4	A
47	Innes Ave/Earl St	8.5(sb)	A	9.9 (sb)	A
48	Evans Ave/Jennings St	8	A	33	D
49	Bayshore Blvd/Geneva Ave	20	B	44	D
50	Bayshore/Guadalupe Pkwy	10	A	9	A
51	Bayshore Blvd/Valley Dr	11	B	10	A
52	Bayshore Blvd/Old County Rd	26	C	43	D
53	Sierra Pt/Lagoon Way	8	A	43	D
54	Ingalls St/Palou Ave	8	A	16	B
55	Keith St/Palou Ave	8	A	10	B
56	Third/Williams/Van Dyke	22	C	14	B
57	Third St/Jerrold Ave	21	C	23	C
58	Evans/Napoleon/Toland	32	C	**57**	**E**
59	Harney/Executive Park East	8.8 (eb)	A	18	B
60	Harney/Thomas Mellon	--	--	15	B

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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.**
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
Source: Fehr & Peers.

Under the 2030 No Project conditions, 38 of the 60 intersections would operate at LOS E or LOS F (as compared with three intersections under existing conditions). The intersections include:

- Third/25th
- Third/Cargo
- Third/Evans
- Third/Palou

- Third/Gilman/Paul
- 25th/Pennsylvania
- Cesar Chavez/Pennsylvania/I-280 northbound off-ramp
- Cesar Chavez/Evans
- Bayshore/Paul
- Bayshore/Hester/U.S. 101 southbound off-ramp
- Bayshore/Tunnel
- Bayshore/Bacon/Egbert/Phelps
- Bayshore/Arleta
- Bayshore/Leland
- Bayshore/Visitacion
- Bayshore/Sunnydale
- Tunnel Blanken
- Geneva/U.S. 101 southbound ramps (existing Alana/Beatty)
- Harney/U.S. 101 northbound ramps (existing Alana/Harney/Thomas Mellon)
- Harney/Jamestown
- Crisp/Palou/Griffith
- Arelious Walker/Gilman
- Amador/Cargo/Illinois
- Bayshore/Cortland
- Bayshore/Alemany/Industrial
- Bayshore/U.S. 101 northbound off-ramp/Jerrold
- Bayshore/Silver
- Bayshore/Blanken
- San Bruno/Paul
- San Bruno/Silver
- San Bruno/Mansell/U.S. 101 southbound off-ramp
- San Bruno/Silliman/U.S. 101 southbound ramps
- Evans/Jennings
- Bayshore/Geneva
- Bayshore/Old County
- Sierra Point Parkway/U.S. 101 southbound ramps/Lagoon Way
- Third/Jerrold
- Evans/Napoleon/Toland

As indicated in section 4.3, a number of intersection improvements would be implemented as part of conditions of approval placed on development projects by the Planning Department and the Redevelopment Agency. For the intersections of Cesar Chavez/Evans and Third/Evans, the Hunters Point Shipyard Development Plan's Mitigation Monitoring and Reporting Program included an improvement at the intersection of Cesar Chavez/Evans, which have not been assumed for the 2030 No Project condition due to its infeasibility.

Cesar Chavez/Evans – The Hunters Point Shipyard Redevelopment Plan's mitigation measure identified reconfiguration of the northbound approach of Evans Avenue to Cesar Chavez Street to provide exclusive northbound left and right turn lanes, and changing the signal timing plan to include the exclusive left turn and right turn movements. The measure identified that the southeast corner curb return would require structural modifications to the existing viaduct. DPW, as part of the BTI Project analysis, identified widening of the existing structure supporting the Evans Avenue and Cesar Chavez Street intersection as infeasible.

With the planned construction of a Class II bicycle lane on Cesar Chavez Street, which would remove an eastbound travel lane on Cesar Chavez Street, the operations at this intersection are expected to deteriorate even further. As a result, widening the Evans Avenue viaduct to provide an additional lane on Evans Avenue may not offer a substantial benefit, since the primary constraint would be on Cesar Chavez Street.

Third/Evans – The Hunters Point Shipyard Redevelopment Plan included a mitigation measure at the intersection of Third/Evans which proposed that the southbound left turn lane be eliminated and left turns be rerouted via Phelps Street to Evans Avenue. The mitigation measure also called for signalization of the intersection of Phelps/Evans and removal of on-street parking on Phelps Street and Evans Avenue. The intersection of Phelps Street and Evans Avenue has recently been signalized and on-street parking has been removed along Phelps Street and Evans Avenue, although the removal of the southbound left-turn movement from Third Street to Evans Avenue has not been implemented. Evaluation of intersection operating conditions with the rerouting of southbound left turns indicated that the elimination of the southbound left turn lane and rerouting of traffic to Phelps Street would not substantially improve intersection operating conditions and overall intersection operations would remain at LOS F.

5.1.2 Freeway Operations

The regional freeway and ramp analysis discusses traffic impacts on freeway segments and ramp locations that would be affected by cumulative development in the region. Five freeway locations (10 segments) and 15 ramp junctions along U.S. 101 and I-280 within the study area were analyzed. Transportation Study Appendix E contains a summary of freeway and ramp traffic volumes.

As described in Chapter 4, traffic forecasts were derived from the SF-CHAMP travel demand forecasting model. These forecasts were developed assuming the planned roadway improvements discussed in Section 4.3 would be in place, including the Geneva Avenue extension and the proposed new interchange with Geneva Avenue/Harney Way/U.S. 101. Without the proposed Geneva Avenue Extension and the Geneva/Harney/U.S. 101 interchange improvements, existing roadways serving the Harney interchange (Bayshore Boulevard, Harney Way, Blanken, Alana Way, Tunnel Road) would not be able to accommodate the projected traffic demand and would become oversaturated. Development of a number of the proposed and approved development projects would be constrained, and the existing roadway system would not be able to accommodate full buildout of these developments. Without the interchange the significant levels of congestion on area roadways due to proposed development would be considered a significant impact.

Future traffic demand associated with growth in the region and, in particular the study area, would increase congestion during the 2030 No Project weekday AM and PM peak periods. A discussion of the mainline and ramp analysis results is provided below. Locations operating at LOS E, indicating that the mainline segment is approaching capacity, and locations operating at LOS F, indicating that the segment is exceeding capacity, are noted.

Mainline and Weaving Segments

Table 39 presents the results of the freeway mainline and weaving section analysis for the 2030 No Project conditions. Traffic demand associated with cumulative development in the region would result in poor (i.e., LOS E or LOS F) operating conditions at all analysis segments during the weekday AM and/or PM peak hours. Weekday AM and PM peak hour traffic impacts on these ten freeway mainline segments would be considered significant cumulative impacts under 2030 No Project conditions. Study freeway segments generally operate at acceptable levels of service during the Sunday PM peak hour.

Table 39
Mainline and Weaving Segment LOS
Existing and 2030 No Project Conditions
Weekday AM and (PM) Peak Hour

Mainline Segment	Existing		2030 Cumulative No Project	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101				
NB - Cesar Chavez to Vermont	**E** (D)	**44.6** (26.8)	**F** (**F**)	**>45** (**>45**)
NB – Harney Way to Third/Bayshore	D **(E)**	33.8 **(42.3)**	**F (F)**	**>45** (**>45**)
NB – Sierra Point to Harney Way	D (**E**)	33.8 (**42.9**)	**E (F)**	**40.5 (>45)**
SB – I-80 Merge to Cesar Chavez	D (D)	33.4 (33.8)	**F (F)**	**>45 (>45)**
SB – Third/Bayshore to Alana Way	**E (E)**	**43.0 (36.0)**	**F (F)**	**>45 (>45)**
SB – Alana Way to Sierra Point	**E (E)**	**42.2 (36.8)**	**F (F)**	**>45 (>45)**
I-280				
NB – Alemany Off to Alemany On	**E** (C)	**39.1** (23.9)	**F** (D)	**>45** (33.3)
SB – Alemany On to Alemany Off	C **(F)**	23.9 (**>45**)	D **(F)**	34.6 **(>45)**
Weaving Segment	**LOS**	**Service Volume[2] (pc/h)**	**LOS**	**Service Volume (pc/h)**
I-280				
NB – 25th Street to Mariposa Street	**E** (C)	**1,680** (1,350)	**F (F)**	**> 1,900 (>1,900)**
SB – Mariposa Street to 25th Street	B (**E**)	810 (**1,630**)	**E (F)**	**1,710 (>1,900)**

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. For weaving sections service volume is reported as the measure of effectiveness. pc/h = passenger cars per hour
3. Segments operating at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

Ramp Junctions

Table 40 presents the results of the ramp junction merge (on-ramp) and diverge (off-ramp) analysis for the 2030 No Project conditions. Traffic demand associated with cumulative development in the region would result in poor (i.e., LOS E or LOS F) operating conditions all of the study ramps during the weekday AM and/or PM peak hours, with the exception of U.S. 101 northbound on-ramp from Bayshore Boulevard and the U.S. 101 southbound on-ramp from Alemany/San Bruno.

Table 40
Ramp Junction LOS
Existing and 2030 No Project Conditions
Weekday AM and (PM) Peak Hour

Ramp Location	Existing		2030 No Project	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101				
NB on from Sierra Point Parkway	C (C)	27.0 (29.7)	C **(F)**	27.5 **(>45)**
NB on from Harney Way[2]	C (D)	20.2 (30.0)	**F (F)**	**>45 (>45)**
NB on from Bayshore	D (D)	31.2 (28.6)	C (C)	22.5 (27.9)
NB on from Alemany/Industrial	**E** (D)	**36.4** (30.2)	**F (E)**	**>45 (35.9)**
NB on from Bayshore/Cesar Chavez	**F** (B)	**>45** (19.6)	**F (F)**	**>45** (>45)
SB off to Bayshore/Cesar Chavez	**F (F)**	**>45 (>45)**	**F (F)**	**>45 (>45)**
SB on from Cesar Chavez/Potrero	**F (F)**	**>45 (>45)**	**F (F)**	**>45 (>45)**
SB on from Alemany/San Bruno	C (C)	24.1 (24.5)	D (D)	28.8 (29.6)
SB on from Third/Bayshore	D (C)	30.0 (26.5)	**F** (D)	**>45 (>45)**
SB on from Alana Way[2]	D (C)	29.7 (24.2)	**F** (D)	**>45 (**31.9**)**
SB on from Sierra Point/Lagoon	C (C)	27.7 (26.5)	**F** (C)	**>45 (**22.7**)**
I-280				
NB off to Cesar Chavez	**F** (D)	**>45** (28.4)	**F (F)**	**>45 (>45)**
NB on from Indiana/25th	D (C)	33.4 (27.4)	**F (F)**	**>45 (>45)**
SB off to Pennsylvania/25th	C **(E)**	23.6 **(36.7)**	**E (F)**	**37.0 (>45)**
SB on from Pennsylvania/25th	C **(E)**	22.9 **(38.5)**	**E (F)**	**36.3 (>45)**

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. Cumulative 2030 No Project conditions assume the reconstruction of the Harney Way interchange, as well as the extension of Geneva Avenue from Bayshore Boulevard east to the reconstructed interchange.
3. Ramp junctions at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

The following ramps would operate at LOS E or LOS F during the Sunday PM peak hour:

- U.S. 101 northbound on-ramp from Bayshore Boulevard/Cesar Chavez (LOS F)
- U.S. 101 southbound off-ramp to Bayshore Boulevard/Cesar Chavez (LOS E)

Traffic impacts at these ramp junctions would be considered significant cumulative impacts under 2030 No Project conditions. Providing additional on-ramp lanes would simply increase the volume of traffic entering the freeway mainline segment, and may exacerbate conditions. Further, increasing mainline capacity is not feasible, as discussed above. To be effective, reducing impacts at off-ramps would require not only additional lanes on the off-ramps, but additional right-of-way on the mainline approaching the off-ramp, which is not feasible as discussed above. Therefore, cumulative impacts to ramp junctions would be considered *significant and unavoidable*.

Table 41 presents the results of the freeway diverge (off-ramp) queue storage analysis for the 2030 No Project conditions. This analysis was conducted to determine whether queues at ramp terminal intersections would back onto freeway mainline segments. Under 2030 No Project conditions, queues may extend onto study freeway mainline segments during the weekday AM and PM peak hours at the following five off-ramps:

- U.S. 101 northbound off-ramp to Geneva/Harney (PM)
- U.S. 101 northbound off-ramp to Bayshore/Cesar Chavez (AM)
- U.S. 101 southbound off-ramp to Alana Way (AM and PM)
- U.S. 101 southbound off-ramp to Sierra Point Parkway/Lagoon Way (AM)
- I-280 northbound off-ramp to Cesar Chavez (AM)

Table 41
Freeway Diverge Queue Storage
Existing and 2030 No Project Conditions
Weekday AM and (PM) Peak Hour

Ramp Location	Ramp Storage	Existing 95th % Queue[1]	2030 No Project 95th % Queue
U.S. 101			
NB off to Harney Way[2]	2,800	< 100 (<100)	1,725 **(Spillback)**
NB off to Bayshore/Cesar Chavez	750	400 (375)	**Spillback** (525)
SB off to San Bruno/Silliman	600	225 (225)	175 (425)
SB off to San Bruno/Mansell	650	< 100 (150)	< 100 (350)
SB off to Bayshore/Hester	1,700	225 (325)	275 (125)
SB off to Alana Way[2]	1,000	< 100 (<100)	**Spillback (Spillback)**
SB off to Sierra Point/Lagoon	1,250	< 100 (<100)	**Spillback** (1,000)
I-280			
NB off to Cesar Chavez	2,500	1,500 (650)	**Spillback** (900)
SB off to Pennsylvania/25th	900	< 100 (<100)	< 100 (875)

Notes:
1. Ramps where there is potential for spillback are highlighted in **bold.**
2. 95th percentile queue is the length of queue that has a probability of 5 percent or less of being exceeded during the peak hour.
3. 2030 No Project conditions assume the reconstruction of the Harney Way Interchange as well as the connection of Geneva Avenue to the reconstructed interchange.
Source: Fehr & Peers.

During the Sunday PM peak hour, vehicle queues may also back onto freeway mainline at the following location:

- U.S. 101 southbound off-ramp to Alana Way

The analysis described above is based on travel demand volumes, and is not necessarily constrained to the amount of traffic that may actually arrive at ramp terminal intersections. As described earlier, many freeway segments would be congested, operating below free-flow speeds during peak hours, reducing the amount of traffic that can reach the off-ramp terminal intersections. Therefore, actual conditions may be better than presented in **Table 41.** Further, since mainline traffic would likely be moving at relatively slow (congested) speeds, safety and capacity issues caused by vehicle queues extending onto freeway mainline segments during peak hours are reduced compared to the same condition when freeway mainline segments are operating at higher free-flow speeds. However, potential queues spilling back onto freeway mainline segments would be considered significant cumulative impacts.

5.2 TRANSIT IMPACTS

This section describes the transit impacts associated with the 2030 No Project conditions. Transit impacts were evaluated for the weekday AM and PM peak hours, similar to the analysis conducted for traffic impacts. The transit impacts analysis focuses both on local transit service provided by Muni and on regional service provided by BART, Golden Gate Transit, SamTrans, Caltrain, and the Water Emergency Transit Authority (WETA).

The analysis of impacts to local Muni transit service was conducted at the same cordon and screenline locations described in the Project setting chapter (Chapter 3). As shown in **Table 42,** ridership on Muni cordons is expected to increase substantially under 2030 No Project conditions, as compared to existing conditions. During the AM peak hour, the North cordon is expected to exceed its capacity by 17 percent in the inbound direction and 7 percent in the outbound direction (relative to downtown). The West cordon is expected to exceed the capacity utilization standard in the inbound direction by 7 percentage points. In the PM peak hour, the North cordon is expected to be over-capacity by 16 percent in the inbound direction and exceed the 85 percent utilization standard by 7 percentage points in the outbound direction.

The large increases in north-south Muni ridership in the study area would be due to the large amount of development anticipated along the Third Street corridor, including Brisbane Baylands, Mission Bay, and the Central Waterfront/Eastern Neighborhoods as well as anticipated completion of the Central Subway project, which is expected to increase ridership on the T-Third light rail route. Since the East, North, and West cordons would all operate at more than the capacity utilization standard in one or more peak hours, there would be significant transit impacts at these cordons under 2030 No Project conditions.

Table 42
Muni Ridership and Capacity Utilization at Study Area Cordons
Existing and 2030 No Project Conditions – Weekday AM and PM Peak Hours

Cordon/Peak Hour	Existing		2030 No Project [1]	
	Ridership	Capacity Utilization	Ridership	Capacity Utilization
AM Peak Hour				
East of Third Cordon				
Inbound	686	40%	1,353	79%
Outbound	319	19%	1,577	92%
North Cordon				
Inbound	859	41%	2,065	117%
Outbound	754	36%	1,901	107%
West Cordon				
Inbound	1,348	68%	2,053	92%
Outbound	722	36%	1,536	69%
PM Peak Hour				
East of Third Cordon				
Inbound	389	23%	1,382	81%
Outbound	253	15%	848	49%
North Cordon				
Inbound	846	41%	2,049	116%
Outbound	626	30%	1,628	92%
West Cordon				
Inbound	711	36%	1,196	54%
Outbound	824	42%	1,249	56%

Note:
1. Year 2030 No Project analysis reflects implementation of TEP recommendations for lines serving the study area. 19-Polk will no longer serve the study area, but will be replaced by the 48-Quintara-24th Street, and the 56-Rutland will be eliminated.
Source: SFMTA, Fehr & Peers.

Table 43 presents the 2030 No Project conditions transit ridership at the Muni downtown screenlines. Although ridership through the screenlines is expected to increase by approximately 30 percent between existing conditions and year 2030, transit capacity is also expected to increase, such that the expected transit ridership would not exceed Muni's 85 percent capacity utilization standard on any of the downtown screenlines.

Table 43
Muni Ridership and Capacity Utilization at Downtown Screenlines
Existing and 2030 No Project Conditions – Weekday AM and PM Peak Hours

Cordon/Peak Hour	Existing		2030 No Project [1]	
	Ridership	Capacity Utilization	Ridership	Capacity Utilization
AM Peak Hour				
Northeast	1,882	50%	3,008	78%
Northwest	7,434	65%	8,949	75%
Southeast	4,248	67%	7,248	71%
Southwest	6,627	76%	7,674	76%
Total All Screenlines	20,191	67%	26,879	74%
PM Peak Hour				
Northeast	1,886	52%	3,140	67%
Northwest	6,621	65%	8,155	70%
Southeast	4,668	66%	7,733	78%
Southwest	7,434	77%	8,829	82%
Total All Screenlines	20,609	68%	27,857	75%

Source: SFMTA, Planning Department, AECOM, Fehr & Peers.

Table 44 presents the ridership and capacity utilization for existing and 2030 No Project conditions at the regional screenlines. The analysis of regional transit impacts under the 2030 No Project conditions shows that during the AM peak hour, the overall transit travel demand to the East Bay would be approximately 50 percent higher than the total seated capacity and the travel demand to the North Bay would be just over the expected capacity. The BART system would be the most heavily congested of the transit providers, operating at 85 percent above its seated hourly capacity in the AM peak hour through the transbay tube. Travel on BART between the Project site and the South Bay would remain below the total capacity under 2030 No Project conditions.

Table 44
Ridership and Capacity Utilization at Regional Screenlines
Existing and 2030 No Project Conditions – Weekday AM and PM Peak Hours

Cordon/Peak Hour	Existing		2030 No Project	
	Ridership	Capacity Utilization	Ridership	Capacity Utilization
AM Peak Hour				
East Bay				
BART	18,064	123%	36,202	185%
AC Transit	1,670	55%	3,347	61%
Ferries	667	56%	1,971	83%
subtotal	20,401	108%	41,520	151%
North Bay				
Golden Gate Transit	1,510	57%	2,623	106%
Ferries	949	56%	1,647	97%
subtotal	2,459	56%	4,268	102%
South Bay				
BART	11,185	105%	12,409	89%
Caltrain	2,128	65%	4,454	70%
SamTrans	686	65%	794	75%
	--	--	152	51%
Subtotal	13,999	94%	17,809	82%
Total All Screenlines	*36,859*	*96%*	*63,597*	*119%*
PM Peak Hour				
East Bay				
BART	16,985	120%	30,241	154%
AC Transit	2,517	60%	4,485	68%
Ferries	702	46%	2,147	79%
subtotal	20,204	102%	36,873	128%
North Bay				
Golden Gate Transit	1,397	63%	2,513	114%
Ferries	906	53%	1,630	96%
subtotal	2,303	59%	4,143	106%
South Bay				
BART	9,545	92%	10,631	76%
Caltrain	1,986	61%	3,959	62%
SamTrans	575	61%	362	39%
Ferries	--	--	75	25%
Subtotal	12,106	83%	15,027	69%
Total All Screenlines	***34,613***	***90%***	***56,043***	***103%***

Source: SFMTA, AECOM, Fehr & Peers.

Under 2030 No Project, weekday PM peak hour conditions would be slightly less congested than during the AM peak hour, with overall transit travel demand to the East Bay exceeding capacity by 28 percent. Similar to the AM peak hour, BART between San Francisco and the East Bay would be the most heavily congested system, operating at 55 percent above its capacity. Travel between San Francisco and the North Bay would exceed available capacity by six percent, and travel between San Francisco and the South Bay would remain within the available capacity.

Since the East Bay and North Bay regional screenlines would operate at more than the capacity utilization standard, there would be significant cumulative transit impacts at these regional screenlines under the No Project conditions.

Transit travel times would also increase under 2030 No Project conditions due to increased traffic congestion and transit ridership associated with cumulative development (including development that would occur at the project site under the currently approved Hunters Point Shipyard Development Plan). A discussion of potential Project impacts to transit travel times is included in Chapter 6, section 6.2.1.

Chapter 6
YEAR 2030 PROJECT IMPACT ANALYSIS

6.1 TRAFFIC IMPACTS

Consistent with the Significance Criteria presented in section 4.4, intersections where the Project, Project Variants, or Project Alternatives would result in a change in intersection operations from LOS D or better under the 2030 No Project condition to LOS E or LOS F, or from LOS E to LOS F, with the proposed Project are identified as Project impacts. At intersections that would operate at LOS E or LOS F under 2030 No Project conditions, and would continue to operate at LOS E or LOS F under Project conditions, the Project trips were reviewed to determine whether the increase would contribute considerably to critical movements operating at LOS E or LOS F. Transportation Study Appendix E includes the percent contributions of the resulting traffic increases at the critical movements at intersections operating at LOS E or LOS F under 2030 No Project conditions.

For freeway mainline and ramp analyses, locations where the Project, Project Variants, or Project Alternatives would result in a change from LOS D or better under 2030 No Project conditions to LOS E or LOS F, or from LOS E or LOS F, with the proposed Project are identified as Project impacts. At locations that would operate at LOS E or LOS F under 2030 No Project conditions, and would continue to operate at LOS E or LOS under Project conditions, the Project trips, as a percentage of total traffic volumes on the facility were reviewed to determine whether the increase would contribute considerably to total volumes on the facility. Transportation Study Appendix G includes the freeway mainline and ramp analyses and the percent contributions calculations.

6.1.1 Project and Project Variants

Overview

The travel demand analysis presented above and the number of vehicle trips assumed in the traffic impact analysis reflects implementation of the Project TDM Plan to encourage transit use and discourage use of single-occupant vehicles. The results of the traffic impact analysis presented in the traffic and freeway analysis below indicate that implementation of the Project would result in significant increases in traffic volumes, and at some locations impacts would be significant and unavoidable. The Project also would make a significant contribution to cumulative impacts at some locations. To minimize the potential for an increase in Project-generated vehicles and the Project's contribution to significant cumulative impacts, implementation of the Project TDM Plan would be required.

The final TDM Plan has not been formally approved yet and therefore Project Mitigation Measure 1 is required to ensure the final TDM Plan will be prepared and implemented. Thus, Mitigation Measure 1 below requires preparation, approval, and implementation of the final TDM Plan.

Project Mitigation Measure 1: The Project Applicant shall prepare and implement a final TDM plan, which shall include the following elements:

- Visitor Variable, Market-Rate Parking Pricing
- Maximum Permitted Parking Ratios
- Flexible Parking Management Strategies
- Unbundled Residential Parking
- Transit Strategies and Support Strategies
- Central Transit Hub
- Enhanced Transit Service and Bicycle Facilities
- Bicycle Support Facilities
- Wayfinding Signs
- EcoPass for Residents
- Carshare Services
- Employee TDM Programs
  - Information Boards/Kiosks
  - In-building Real-Time transit monitors with sightlines of transit hubs
  - Commuter Benefits
  - Employee EcoPass
  - Carpool/Vanpools
  - Guaranteed Ride Home Program
  - Compressed Work Weeks, Flex Time, and Telecommuting
- CP-HPS Transportation Management Association
- On-Site Transportation Coordinator and Website
- Targeted Marketing
- Monitoring of Transportation Demand
- Monitoring Effectiveness of Congestion-Reducing and Traffic-Calming Efforts

The final TDM plan shall be approved as part of the Disposition and Development Agreement (DDA).

With implementation of the Project Mitigation Measure 1, alternative modes would be encouraged, the use of single-occupant vehicles would be discouraged, and the impact of additional vehicles generated by the Project would be lessened. However, as described in Impact discussions below, the Project would still result in significant and unavoidable impacts on traffic and transit operations, and would still make considerable contributions to cumulative impacts related to substantial increases in traffic. Thus, the Project and Project's contribution to traffic would remain *significant and unavoidable.*

Intersection Operations

Project vehicle trips at the 60 study intersection are presented on **Figure 31A** and **Figure 31B** for the weekday AM and PM peak hours, and on **Figure 31C** and **Figure 31D** for the Sunday PM peak hour conditions. Future 2030 Cumulative (including Project trips) traffic volumes at the 60 study intersection are presented on **Figure 32A** and **Figure 32B** for the weekday AM and PM peak hours, and on **Figure 32C** and **Figure 32D** for the Sunday PM peak hour conditions. Transportation Study Appendix E contains intersection turning movement volume summaries.

Tables 45 and 46 on pages 167 to 172 present a comparison of the intersection LOS analysis for the existing, 2030 No Project, and 2030 Project and Project Variant conditions for the weekday AM and PM peak hours, respectively. **Table 47** on pages 173 to 175 presents this comparison for Sunday PM peak hour conditions. **Table 48** on pages 176 to 178 presents the summary table of Project traffic impacts for Project, Project Variants, and Alternatives to the Project.

On **Table 48**, Project impacts (PI) were identified where the Project would result in a change in intersection operations from LOS D or better under 2030 No Project conditions, to LOS E or LOS F with the Project, Project Variants, or Project Alternatives, or from LOS E under 2030 No Project conditions to LOS F with the Project, Project Variants or Alternatives. In addition, where the Project, Project Variants or Project Alternatives were determined to contribute significantly to intersections that would be operating at LOS E or LOS F under 2030 No Project conditions, this was also determined to be a Project impact, and noted as Significant Contribution/Project Impact (SC/PI). Where the Project would *not* contribute significantly to intersections operating at LOS E or LOS F under 2030 No Project conditions, this was noted as No Significant Contribution (NSC).

For 203 No Project conditions, where intersection operations change from LOS D or better under existing conditions to LOS E or LOS F under 2030 No Project conditions, or from LOS E under existing conditions to LOS F under 2030 No Project conditions this was identified as a No Project Impact (NP Impact).

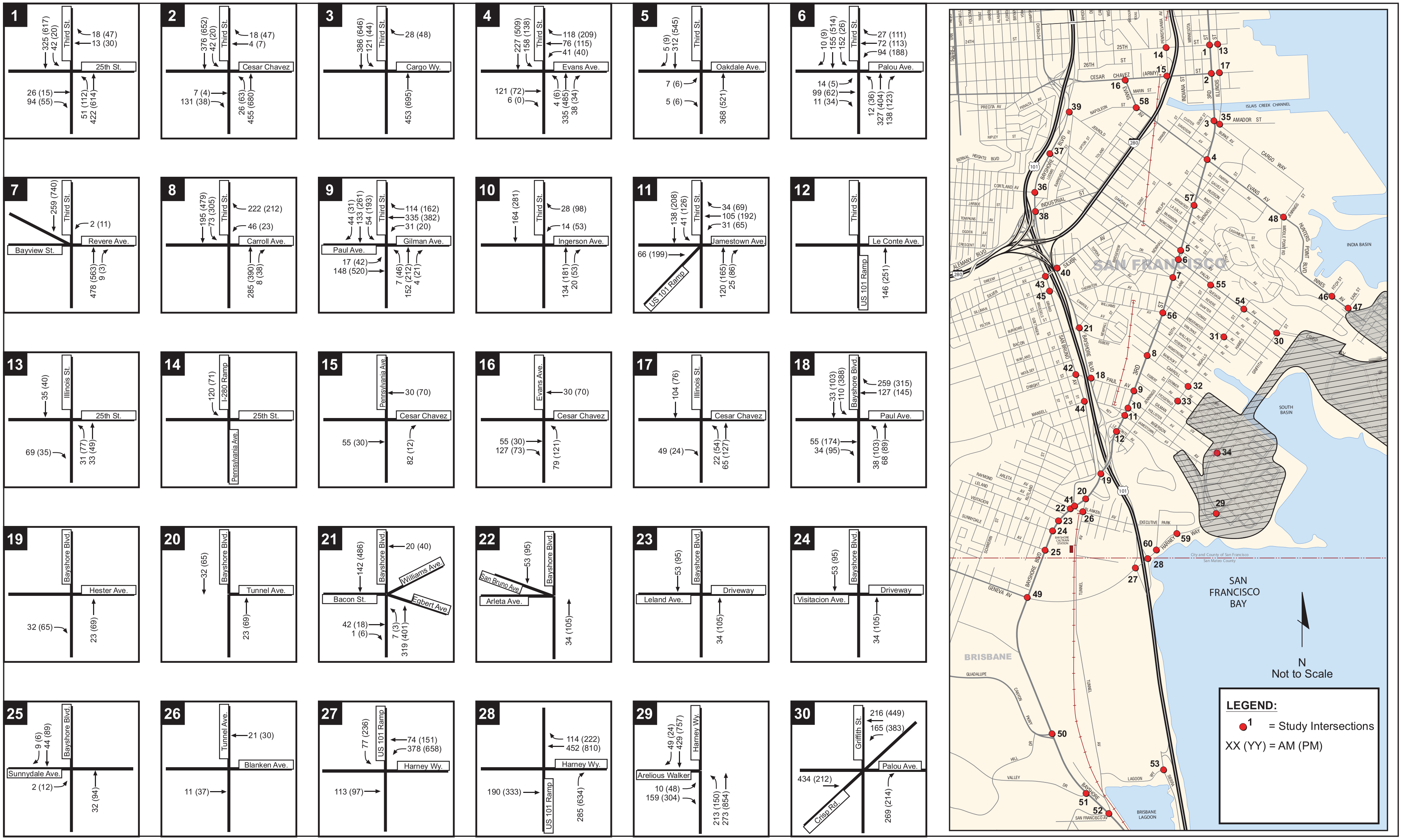
In general, with the addition of Project-generated vehicle trips to the study area roadway network congestion levels would increase. However, due to project roadway improvements, operating conditions at some locations would improve over year 2030 No Project conditions. The number of study area intersections that would operate at LOS E or LOS F conditions would remain at 33 intersections during the AM peak hour and 38 intersections during the PM peak hour.

Because the HCM delay calculations break down in typical LOS F conditions, delays above 80 seconds per vehicle are simply reported as >80. This makes a comparison between scenarios difficult. For these cases, an additional measure was calculated, the volume to capacity (v/c) ratio. When intersections are operating at failing or breakdown conditions they lack the capacity to accommodate any more vehicles. One way of understanding the magnitude of the intersections lack of capacity is to calculate its v/c ratio. Intersections with a v/c ratio below 1.0 for the most part operate acceptably. As the ratio is increased, breakdown conditions will appear as there is more demand (vehicles) than capacity. Three ranges of v/c ratio have been identified in **Figure 33 and Figure 34**, for the AM and PM peak hours, respectively; less than 1.0, 1.0-2.0, and greater than 2.0, respectively, to provide for a useful comparison of the relative magnitudes of congestion at intersections operating at LOS F. The figures indicate where the 2030 No Project and Project v/c are in a different range when compared.

Project-Specific Traffic Impacts

Under Project conditions, a total of 39 of the 60 study intersections would operate at LOS E or LOS F conditions during the weekday AM or PM, or Sunday PM peak hours. At 10 of the 39 intersections the Project would result in Project-specific impacts (i.e., Project trips would cause intersections expected to operate at LOS D or better under 2030 No Project conditions to operate at LOS E or F, or intersections operating at LOS E under 2030 No Project conditions to deteriorate to LOS F conditions). A discussion of traffic operations at these 10 intersections, and potential mitigation measures, follows:

5. Third/Oakdale – At the signalized intersection of Third/Oakdale, the intersection operating conditions would worsen in the PM peak hour from LOS C under 2030 No Project conditions to LOS E with the Project. The degradation in level of service would be primarily due to forecasted substantial traffic volume increases on Third Street. Due to the presence of the Third Street light rail, space for additional travel lanes could not be taken from the center median. Parking is generally permitted on either side of the street; however, it is not permitted at the intersections. Instead, sidewalks are extended to increase the pedestrian waiting area at the intersection and reduce the pedestrian crossing distances.



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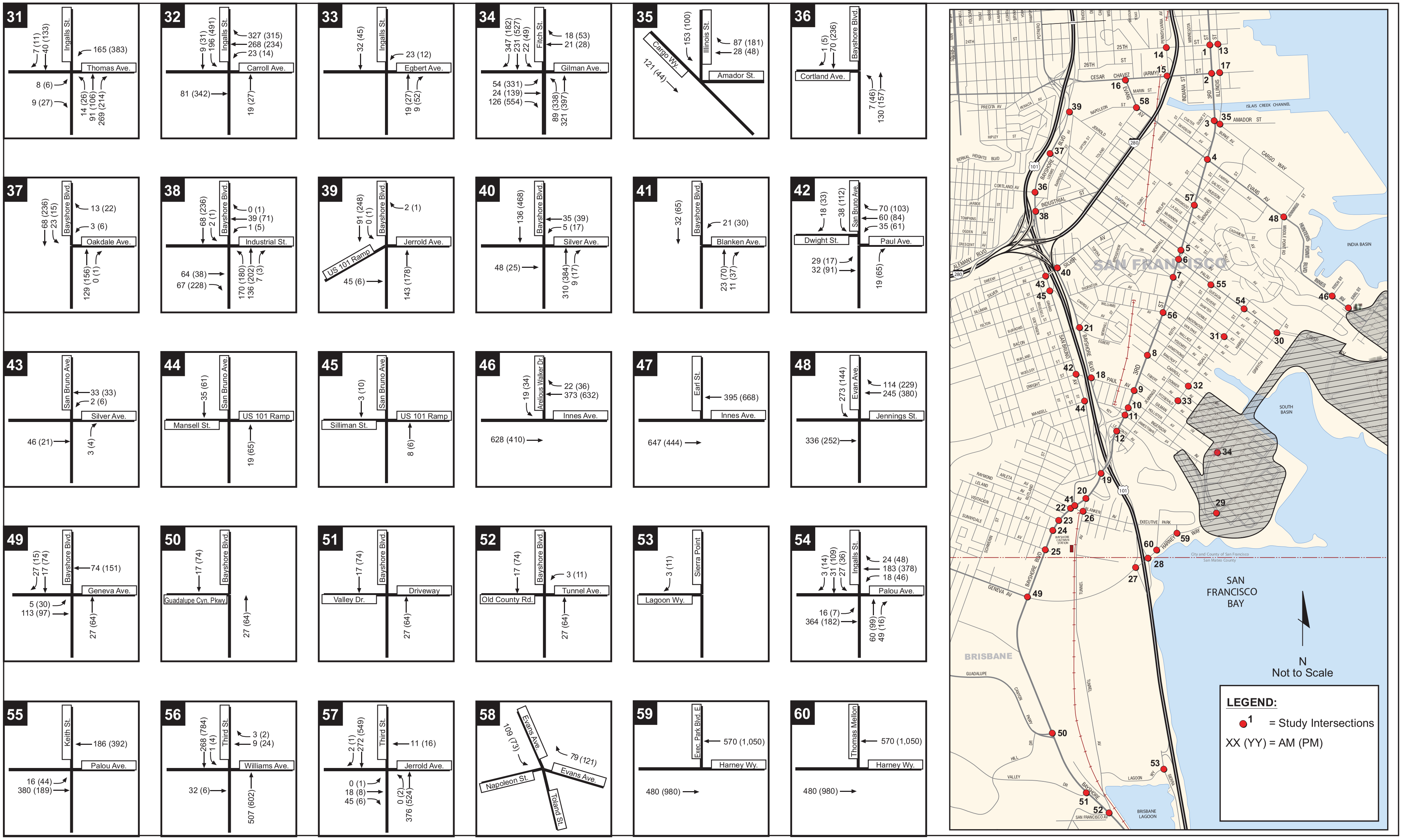
PROJECT TRIPS - WEEKDAY

FIGURE 31A



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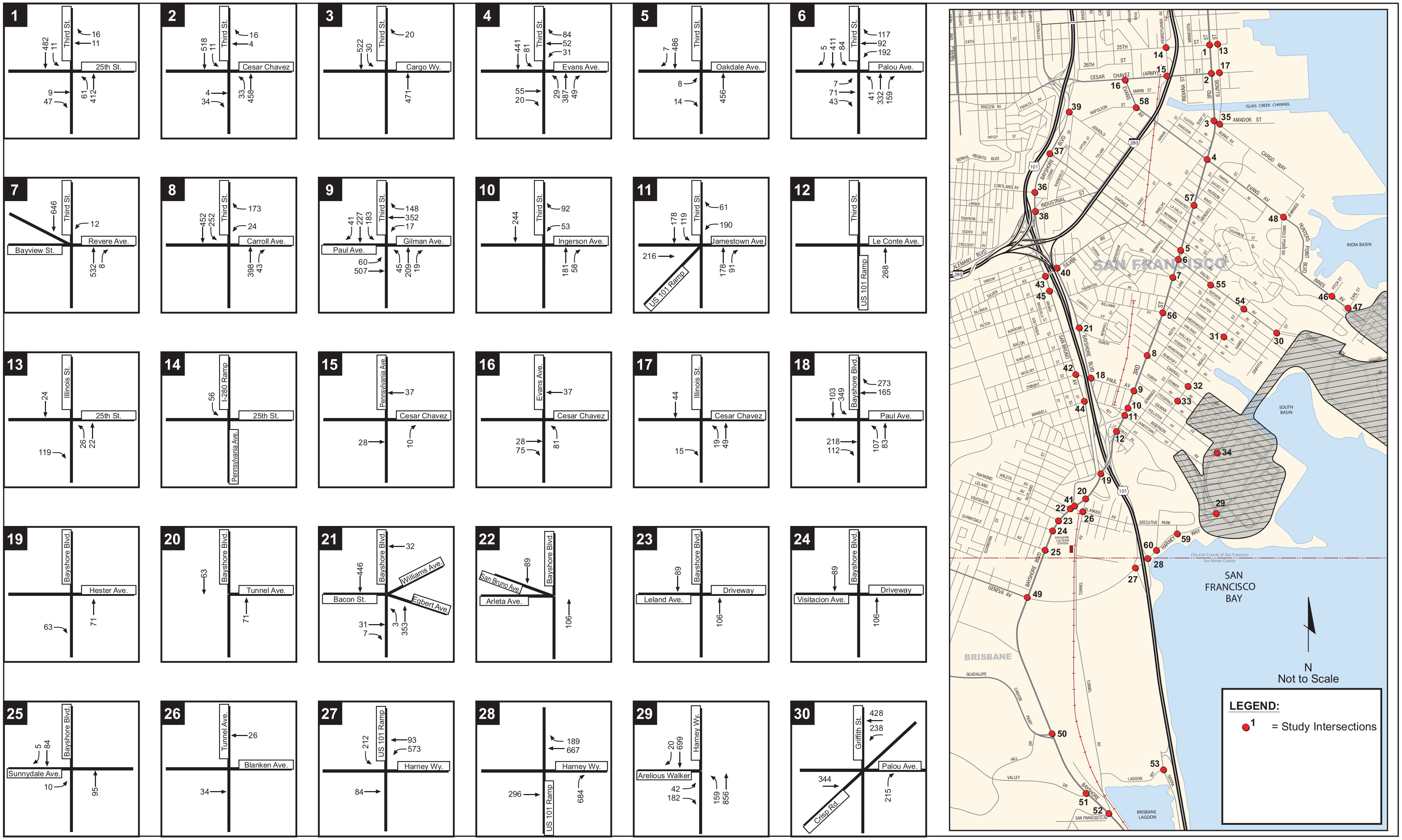
PROJECT TRIPS - WEEKDAY

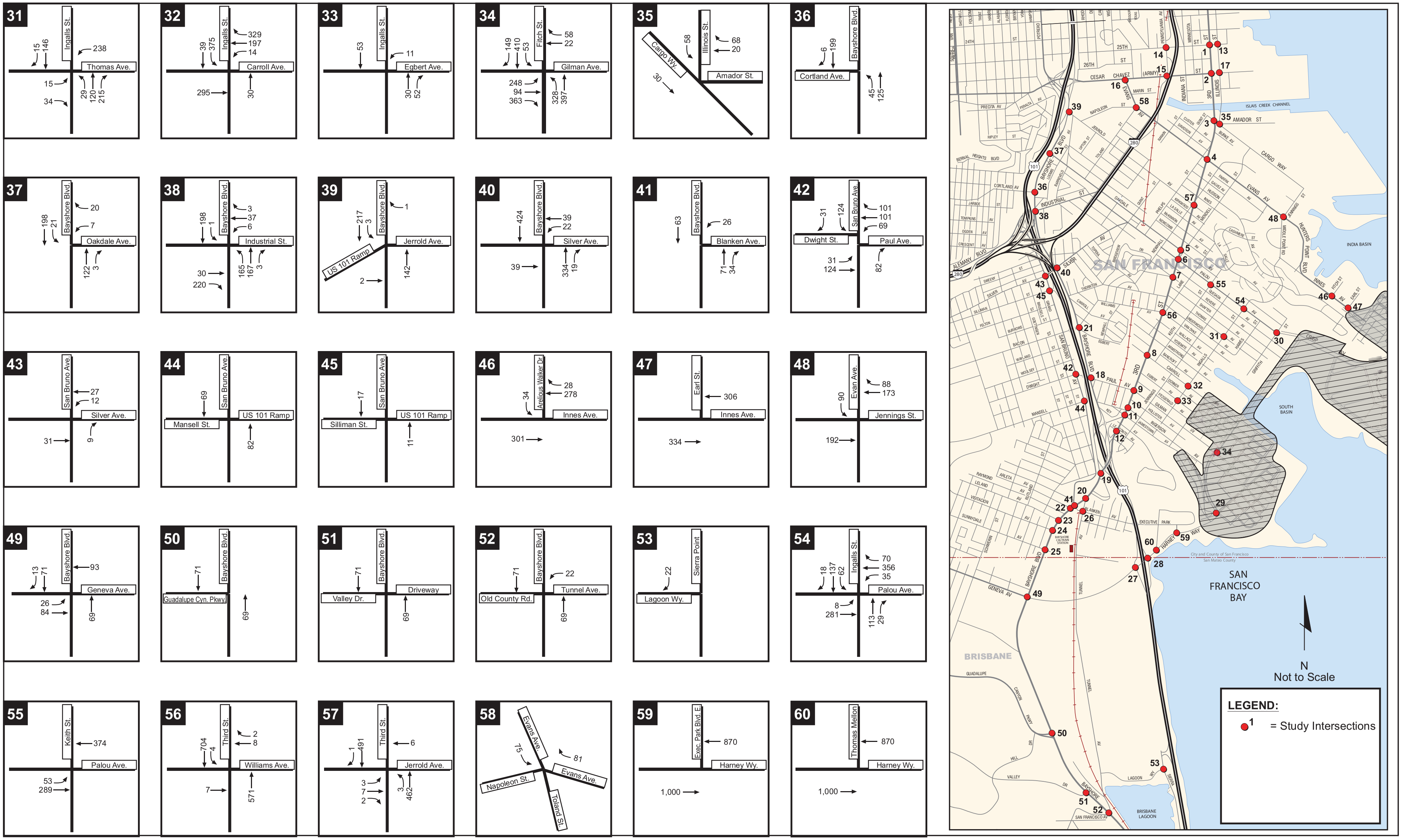
FIGURE 31B



CP-HPS Phase II Development Plan Transportation Study

PROJECT TRIPS - SUNDAY

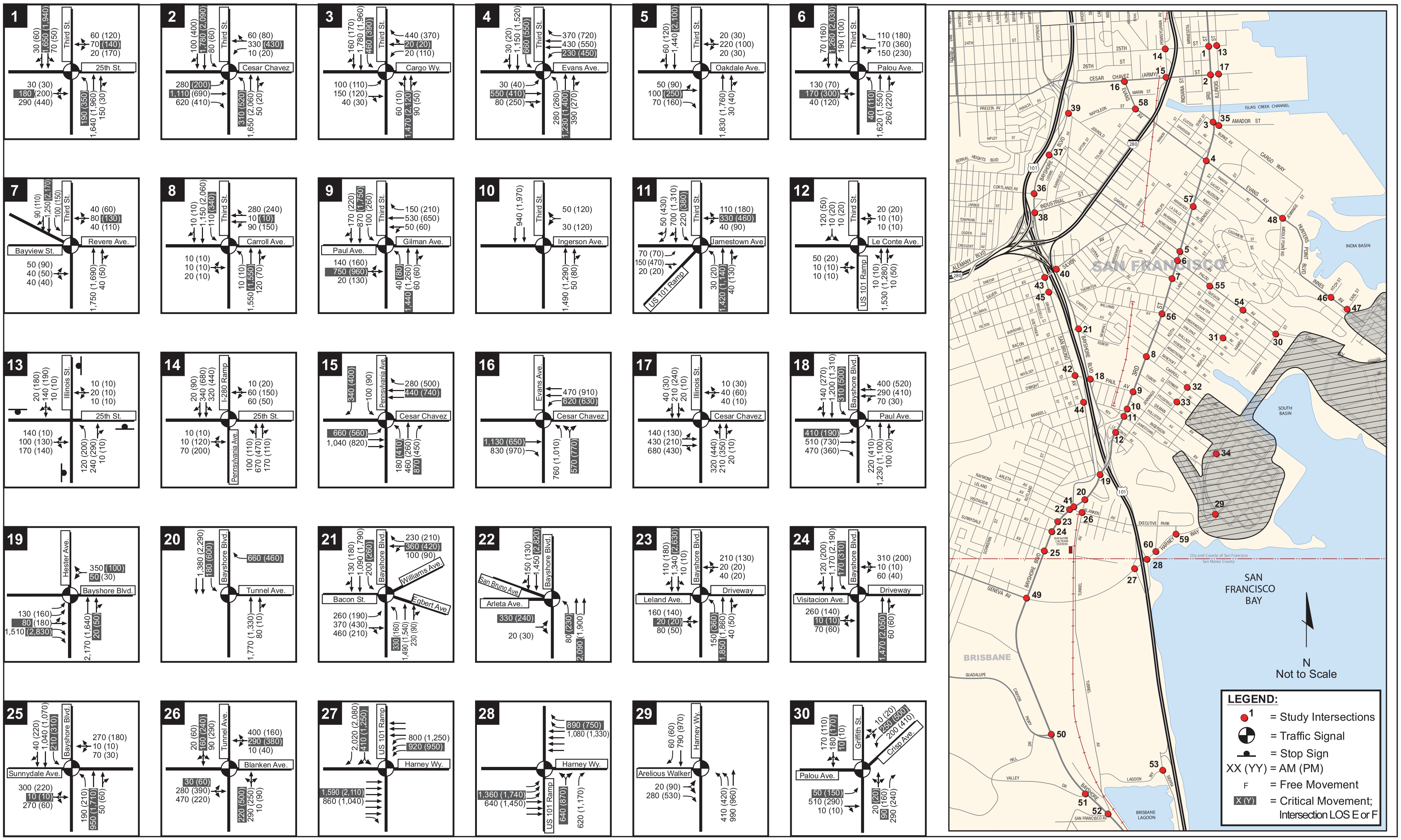
FIGURE 31C



CP-HPS Phase II Development Plan Transportation Study

PROJECT TRIPS - SUNDAY

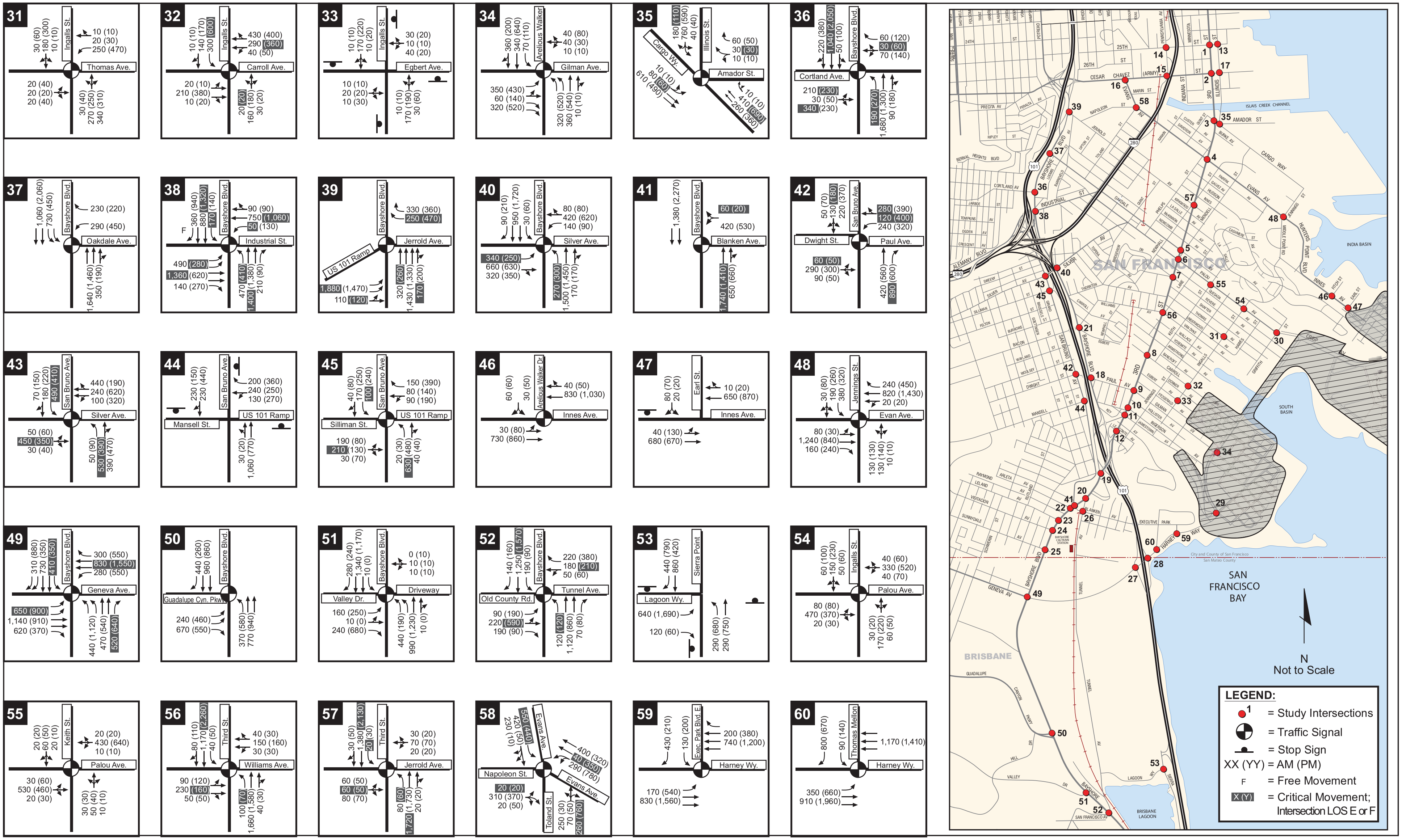
FIGURE 31D



CP-HPS Phase II Development Plan Transportation Study

CUMULATIVE CONDITIONS WEEKDAY
PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS

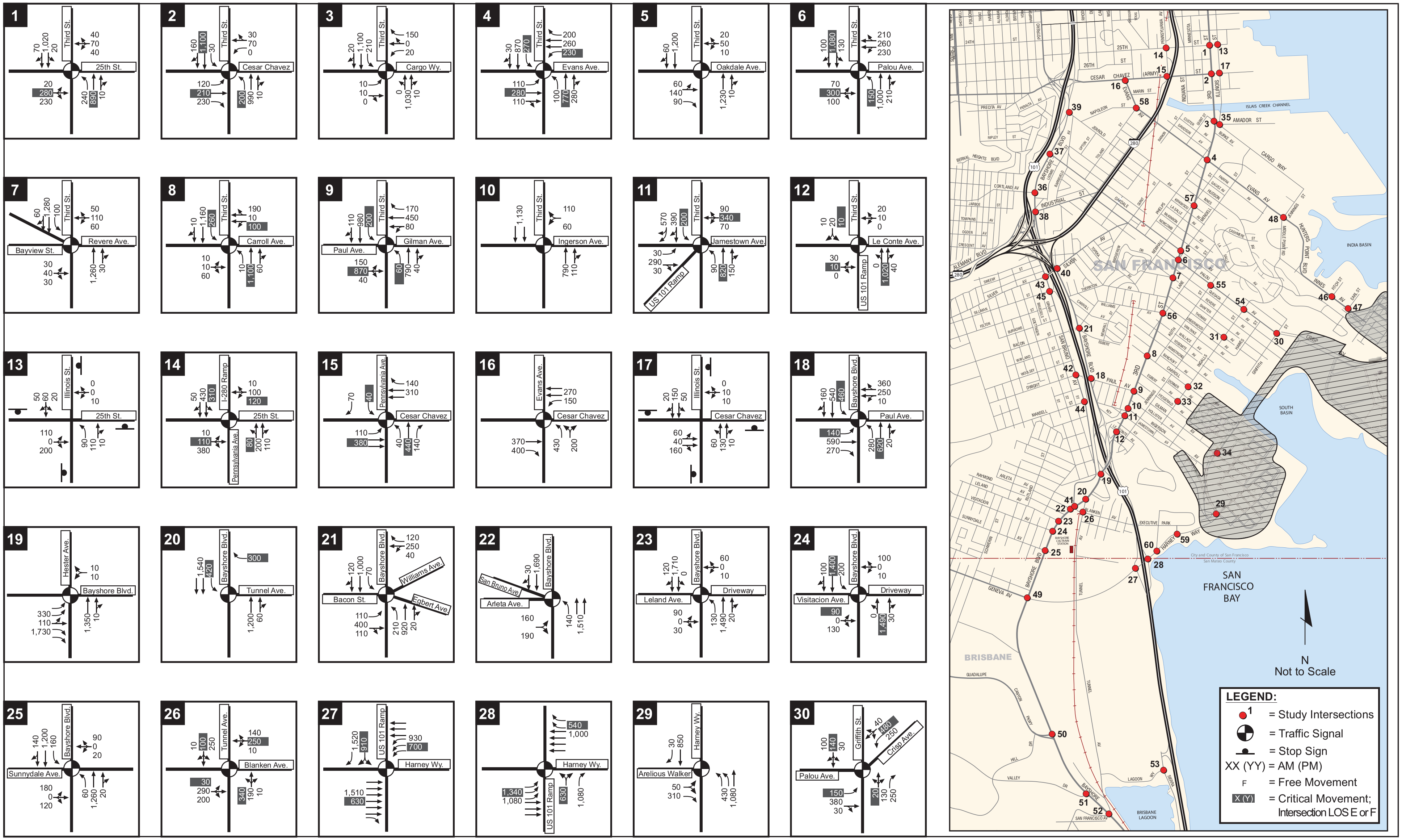
FIGURE 32A



CP-HPS Phase II Development Plan Transportation Study

CUMULATIVE CONDITIONS WEEKDAY
PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS

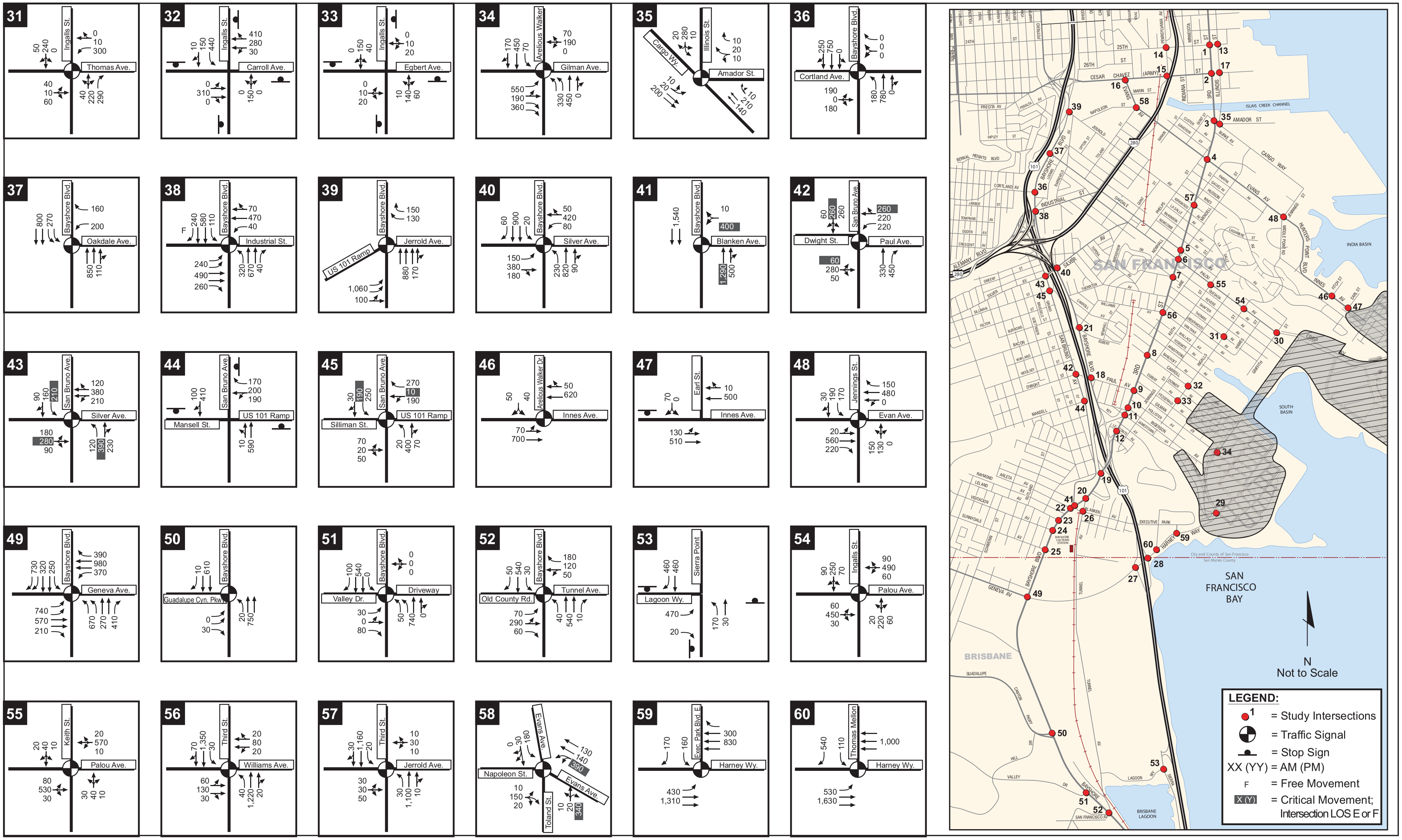
FIGURE 32B



CP-HPS Phase II Development Plan Transportation Study

CUMULATIVE CONDITIONS SUNDAY PM PEAK HOUR (NO FOOTBALL GAME) TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 32C



CP-HPS Phase II Development Plan Transportation Study

CUMULATIVE CONDITIONS SUNDAY PM PEAK HOUR (NO FOOTBALL GAME) TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 32D

Table 45
Intersection LOS
Project and Project Variants – Weekday AM Peak Hour – 2030 Conditions

	Intersection	Existing		No Project (Alt 1)		Project		Project – Variant 1 (R&D)		Project – Variant 2 (Housing)	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Third St/25th St	14	B	**>80/1.43**	**F**	**>80/1.54**	**F**	**>80/1.90**	**F**	**>80/1.53**	**F**
2	Third St/Cesar Chavez St	36	D	**>80/1.61**	**F**	**>80/1.63**	**F**	**>80/1.70**	**F**	**>80/1.63**	**F**
3	Third St/Cargo Way	23	C	**>80/1.36**	**F**	**>80/1.90**	**F**	**>80/1.98**	**F**	**>80/1.90**	**F**
4	Third St/Evans Ave	35	C	**>80/1.41**	**F**	**>80/1.43**	**F**	**>80/1.59**	**F**	**>80/1.44**	**F**
5	Third St/Oakdale Ave	17	B	21	C	25	C	26	C	24	C
6	Third St/Palou Ave	15	B	**>80/1.77**	**F**	**>80/1.91**	**F**	**>80/2.22**	**F**	**>80/1.97**	**F**
7	Third St/Revere Ave	19	B	35	C	51	D	**65/0.91**	**E**	46	D
8	Third St/Carroll Ave	12	B	12	B	23	C	24	C	19	B
9	Third St/Paul Ave	27	C	**>80/1.23**	**F**	**>80/2.00**	**F**	**>80/2.02**	**F**	**>80/1.89**	**F**
10	Third St/Ingerson Ave	5	A	5	A	6	A	7	A	6	A
11	Third St/Jamestown Ave	13	B	29	C	**>80/1.03**	**F**	**76/1.02**	**E**	**77/0.99**	**E**
12	Third/Le Conte/US 101 nb off	11	B	50	D	50	D	50	D	50	D
13	25th St/Illinois St	7	A	14	B	13	B	15	B	13	B
14	25th St/Pennsylvania Ave	9	A	26	D	29	C	30	C	29	C
15	Cesar Chavez/Penns/I-280	**78**	**E**	**>80/1.39**	**F**	**>80/1.39**	**F**	**>80/1.39**	**F**	**>80/1.39**	**F**
16	Cesar Chavez St/Evans Ave	21	C	**>80/1.92**	**F**	**>80/1.91**	**F**	**>80/1.96**	**F**	**>80/1.92**	**F**
17	Cesar Chavez St/Illinois St	13	B	25	C	34	C	27	C	24	C
18	Bayshore Blvd/Paul Ave	21	C	**61/1.56**	**E**	**>80/2.64**	**F**	**>80/2.69**	**F**	**>80/2.63**	**F**
19	Bayshore/Hester/US 101 sb off	28	C	**>80/1.34**	**F**	**>80/1.36**	**F**	**>80/1.36**	**F**	**>80/1.36**	**F**
20	Bayshore Blvd/Tunnel Ave	19	B	**>80/2.00**	**F**	**>80/2.05**	**F**	**>80/2.05**	**F**	**>80/2.05**	**F**

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.

Source: Fehr & Peers.

Table 45 (continued)
Intersection LOS
Project and Project Variants – Weekday AM Peak Hour – 2030 Conditions

	Intersection	Existing		No Project		Project		Project – Variant 1 (R&D)		Project – Variant 2 (Housing)	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
21	Bayshore Blvd/Bacon St	**76**	**E**	**>80/4.05**	**F**	**>80/4.08**	**F**	**>80/4.18**	**F**	**>80/4.18**	**F**
22	Bayshore Blvd/Arleta St	25	C	**>80/1.21**	**F**	**>80/1.23**	**F**	**>80/1.22**	**F**	**>80/1.23**	**F**
23	Bayshore Blvd/Leland Ave	21	C	**>80/1.24**	**F**	**>80/1.26**	**F**	**>80/1.25**	**F**	**>80/1.26**	**F**
24	Bayshore Blvd/Visitacion Ave	17	B	**>80/1.55**	**F**	**>80/1.56**	**F**	**>80/1.56**	**F**	**>80/1.56**	**F**
25	Bayshore Blvd/Sunnydale Ave	20	C	**>80/1.32**	**F**	**>80/1.34**	**F**	**>80/1.33**	**F**	**>80/1.34**	**F**
26	Tunnel Ave/Blanken	11	B	43	D	**>80/1.06**	**F**	**>80/1.06**	**F**	**>80/1.06**	**F**
27	Geneva/U.S. 101 SB Ramps [3]	10	A	**>80/2.17**	**F**	**>80/2.31**	**F**	**>80/2.34**	**F**	**>80/2.31**	**F**
28	Harney/U.S. 101 NB Ramps [3]	8	A	**>80/1.20**	**F**	**>80/1.35**	**F**	**>80/1.39**	**F**	**>80/1.35**	**F**
29	Harney Way/Jamestown Ave [4]	8	A	12	B	20	B	25	B	22	B
30	Crisp Ave/Palou Ave [4]	11.4 (nb)	B	**57/0.99**	**E**	44	D	**>80/1.12**	**F**	42	D
31	Ingalls St/Thomas Ave [4]	11.3 (wb)	B	19.0 (wb)	C	22	C	29	C	22	C
32	Ingalls St/Carroll Ave [4]	8	A	15	B	28	C	31	C	28	C
33	Ingalls St/Egbert Ave	8	A	8	A	9	A	9	A	9	A
34	A.Walker/Gilman Ave [4]	9.1 (sb)	A	**>60 (eb)**	**F**	30	C	30	C	31	C
35	Amador St/Cargo Way	28	C	**65/1.06**	**E**	54	D	**74/1.10**	**E**	**56/1.02**	**E**
36	Bayshore Blvd/Cortland Ave	19	B	37	D	**>80/1.18**	**F**	**>80/1.19**	**F**	**>80/1.18**	**F**
37	Bayshore Blvd/Oakdale Ave	30	C	43	D	51	D	52	D	50	D
38	Bayshore/Alemany/Industrial	44	D	**>80/1.00**	**F**	**>80/1.05**	**F**	**>80/1.06**	**F**	**>80/1.04**	**F**
39	Bayshore/US 101 nb off to Cesar	43	D	**74/0.91**	**E**	**>80/0.94**	**F**	**>80/0.94**	**F**	**>80/0.93**	**F**
40	Bayshore Blvd/Silver Ave	50	D	**>80/1.58**	**F**	**>80/1.70**	**F**	**>80/1.75**	**F**	**>80/1.75**	**F**

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

Table 45 (continued)
Intersection LOS
Project and Project Variants – Weekday AM Peak Hour – 2030 Conditions

	Intersection	Existing		No Project		Project		Project – Variant 1 (R&D)		Project – Variant 2 (Housing)	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
41	Bayshore Blvd/Blanken Ave	12	B	**>80/1.48**	**F**	**>80/1.51**	**F**	**>80/1.51**	**F**	**>80/1.51**	**F**
42	San Bruno Ave/Paul Ave	20	B	**>80/1.21**	**F**	**>80/1.23**	**F**	**>80/1.25**	**F**	**>80/1.23**	**F**
43	San Bruno Ave/Silver Ave	75	E	**>80/1.43**	**F**	**>80/1.41**	**F**	**>80/1.44**	**F**	**>80/1.41**	**F**
44	San Bruno/Mansell/101 sb off	17	C	**>80/1.08**	**F**	**>80/1.11**	**F**	**>80/1.11**	**F**	**>80/1.11**	**F**
45	San Bruno/Silliman/101 sb off	24	C	**>80/1.08**	**F**	**>80/1.08**	**F**	**>80/1.08**	**F**	**>80/1.07**	**F**
46	Innes Ave/A.Walker Drive [4]	8.6 (sb)	A	5	A	6	A	5	A	5	A
47	Innes Ave/Earl St	8.5 (sb)	A	17.3 (sb)	C	13.3 (sb)	B	15.0 (sb)	B	15.0 (sb)	B
48	Evans Ave/Jennings St	9	A	**>80/1.96**	**F**	28	C	**61/1.17**	**E**	30	C
49	Bayshore Blvd/Geneva Ave	24	C	**>80/1.39**	**F**	**>80/1.40**	**F**	**>80/1.40**	**F**	**>80/1.40**	**F**
50	Bayshore/Guadalupe Pkwy	16	B	21	C	21	C	21	C	21	C
51	Bayshore Blvd/Valley Dr	23	C	20	C	20	C	20	C	20	C
52	Bayshore Blvd/Old County Rd	28	C	40	D	39	D	39	D	39	D
53	Sierra Pt/Lagoon Way	12	B	**>80/1.85**	**F**	**>80/1.85**	**F**	**>80/1.85**	**F**	**>80/1.85**	**F**
54	Ingalls St/Palou Ave [4]	9	A	16	B	18	B	23	C	18	B
55	Keith St/Palou Ave [4]	9	A	10	A	9	A	9	A	10	A
56	Third/Williams/Van Dyke	22	C	18	B	30	C	35	D	29	C
57	Third St/Jerrold Ave	22	C	49	D	**>80/0.74**	**F**	**>80/0.79**	**F**	**>80/0.73**	**F**
58	Evans/Napoleon/Toland	37	D	**>80/1.45**	**F**	**>80/1.50**	**F**	**>80/1.53**	**F**	**>80/1.50**	**F**
59	Harney/Executive Park East	9.1 (sb)	A	25	C	25	C	25	C	25	C
60	Harney/Thomas Mellon	--	--	30	C	34	C	35	C	34	C

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
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4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

Table 46
Intersection LOS
Project and Project Variants – Weekday PM Peak Hour – 2030 Conditions

	Intersection	Existing		No Project (Alt 1)		Project		Project – Variant 1 (R&D)		Project – Variant 2 (Housing)	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Third St/25th St	16	B	**>80/2.45**	**F**	**>80/2.92**	**F**	**>80/3.04**	**F**	**>80/2.93**	**F**
2	Third St/Cesar Chavez St	31	C	**>80/1.56**	**F**	**>80/1.76**	**F**	**>80/1.82**	**F**	**>80/1.75**	**F**
3	Third St/Cargo Way	20	B	**>80/1.44**	**F**	**>80/1.74**	**F**	**>80/1.83**	**F**	**>80/1.74**	**F**
4	Third St/Evans Ave	34	C	**>80/1.36**	**F**	**>80/1.53**	**F**	**>80/1.59**	**F**	**>80/1.56**	**F**
5	Third St/Oakdale Ave	19	B	30	C	**60/1.12**	**E**	**67/1.14**	**E**	**60/1.12**	**E**
6	Third St/Palou Ave	30	C	**>80/4.71**	**F**	**>80/5.99**	**F**	**>80/5.97**	**F**	**>80/6.07**	**F**
7	Third St/Revere Ave	31	C	37	D	**>80/1.14**	**F**	**>80/1.20**	**F**	**>80/1.14**	**F**
8	Third St/Carroll Ave	14	B	14	B	**75/0.93**	**E**	**78/0.95**	**E**	**67/0.92**	**E**
9	Third St/Paul Ave	24	C	**>80/1.37**	**F**	**>80/3.36**	**F**	**>80/3.40**	**F**	**>80/3.32**	**F**
10	Third St/Ingerson Ave	5	A	7	A	43	D	43	D	52	D
11	Third St/Jamestown Ave	14	B	30	C	**>80/6.64**	**F**	**>80/1.45**	**F**	**>80/6.15**	**F**
12	Third/Le Conte/US 101 nb off	11	B	24	C	23	C	23	C	23	C
13	25th St/Illinois St	7	A	14	B	14	B	15	C	14	B
14	25th St/Pennsylvania Ave	12	B	**>80/1.42**	**F**	40	D	40	D	40	D
15	Cesar Chavez/Penns/I-280	39	D	**>80/1.36**	**F**	**>80/1.37**	**F**	**>80/1.39**	**F**	**>80/1.37**	**F**
16	Cesar Chavez St/Evans Ave	21	C	**>80/1.83**	**F**	**>80/1.84**	**F**	**>80/1.86**	**F**	**>80/1.84**	**F**
17	Cesar Chavez St/Illinois St	19	B	22	C	23	C	24	C	23	C
18	Bayshore Blvd/Paul Ave	17	B	**>80/2.00**	**F**	**>80/2.90**	**F**	**>80/2.90**	**F**	**>80/2.93**	**F**
19	Bayshore/Hester/US 101 sb off	13	B	**>80/1.25**	**F**	**>80/1.28**	**F**	**>80/1.28**	**F**	**>80/1.28**	**F**
20	Bayshore Blvd/Tunnel Ave	16	B	**>80/2.30**	**F**	**>80/2.51**	**F**	**>80/2.51**	**F**	**>80/2.51**	**F**

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Source: Fehr & Peers.

Table 46 (continued)
Intersection LOS
Project and Project Variants – Weekday PM Peak Hour – 2030 Conditions

	Intersection	Existing		No Project		Project		Project – Variant 1 (R&D)		Project – Variant 2 (Housing)	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
21	Bayshore Blvd/Bacon St	22	C	**>80/1.87**	**F**	**>80/1.91**	**F**	**>80/1.99**	**F**	**>80/1.95**	**F**
22	Bayshore Blvd/Arleta St	25	C	**>80/1.36**	**F**	**>80/1.39**	**F**	**>80/1.39**	**F**	**>80/1.39**	**F**
23	Bayshore Blvd/Leland Ave	22	C	**>80/1.58**	**F**	**>80/1.67**	**F**	**>80/1.67**	**F**	**>80/1.67**	**F**
24	Bayshore Blvd/Visitacion Ave	15	B	**>80/1.43**	**F**	**>80/1.47**	**F**	**>80/1.47**	**F**	**>80/1.47**	**F**
25	Bayshore Blvd/Sunnydale Ave	19	B	**>80/1.15**	**F**	**>80/1.19**	**F**	**>80/1.19**	**F**	**>80/1.19**	**F**
26	Tunnel Ave/Blanken	9	A	**>80/1.46**	**F**	**>80/1.45**	**F**	**>80/1.45**	**F**	**>80/1.45**	**F**
27	Geneva/U.S. 101 SB Ramps [3]	9	A	**>80/2.94**	**F**	**>80/3.25**	**F**	**>80/3.28**	**F**	**>80/3.25**	**F**
28	Harney/U.S. 101 NB Ramps [3]	8	A	**>80/1.43**	**F**	**>80/1.74**	**F**	**>80/1.75**	**F**	**>80/1.74**	**F**
29	Harney Way/Jamestown Ave [4]	8	A	**40/1.03**	**E**	41	D	53	D	41	D
30	Crisp Ave/Palou Ave [4]	11.6 (nb)	B	**58/0.97**	**E**	54	D	**>80/1.18**	**F**	55	D
31	Ingalls St/Thomas Ave [4]	11.5 (wb)	B	27.9 (wb)	C	33	C	49	D	33	C
32	Ingalls St/Carroll Ave [4]	8	A	17	C	38	D	**59/1.01**	**E**	38	D
33	Ingalls St/Egbert Ave	8	A	9	A	9	A	9	A	9	A
34	A.Walker/Gilman Ave [4]	9.2 (sb)	A	**>80 (eb)**	**F**	36	D	38	D	36	D
35	Amador St/Cargo Way	24	C	**60/1.05**	**E**	**59/1.04**	**E**	**79/1.13**	**E**	**60/1.05**	**E**
36	Bayshore Blvd/Cortland Ave	25	C	**>80/1.48**	**F**	**>80/1.87**	**F**	**>80/1.88**	**F**	**>80/1.87**	**F**
37	Bayshore Blvd/Oakdale Ave	26	C	33	C	55	D	**56/1.05**	**E**	**55/1.05**	**E**
38	Bayshore/Alemany/Industrial	**58/**	**E**	**>80/1.23**	**F**	**>80/1.18**	**F**	**>80/1.20**	**F**	**>80/1.18**	**F**
39	Bayshore/US 101 nb off to Cesar	48	D	**>80/0.88**	**F**	**>80/0.91**	**F**	**>80/0.92**	**F**	**>80/0.91**	**F**
40	Bayshore Blvd/Silver Ave	50	D	**>80/2.64**	**F**	**>80/2.91**	**F**	**>80/2.91**	**F**	**>80/2.91**	**F**

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Source: Fehr & Peers.

Table 46 (continued)
Intersection LOS
Project and Project Variants – Weekday PM Peak Hour – 2030 Conditions

	Intersection	Existing		No Project		Project		Project – Variant 1 (R&D)		Project – Variant 2 (Housing)	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
41	Bayshore Blvd/Blanken Ave	11	B	**>80/1.33**	**F**	**>80/1.40**	**F**	**>80/1.40**	**F**	**>80/1.40**	**F**
42	San Bruno Ave/Paul Ave	20	B	**>80/2.10**	**F**	**>80/2.71**	**F**	**>80/2.76**	**F**	**>80/2.75**	**F**
43	San Bruno Ave/Silver Ave	46	D	**>80/1.46**	**F**	**>80/1.56**	**F**	**>80/1.60**	**F**	**>80/1.57**	**F**
44	San Bruno/Mansell/101 sb off	33	D	**64/1.15**	**F**	**>80/1.22**	**F**	**>80/1.22**	**F**	**>80/1.20**	**F**
45	San Bruno/Silliman/101 sb off	20	B	38	D	38	D	38	D	38	D
46	Innes Ave/A.Walker Drive [4]	8.7 (sb)	A	5	A	6	A	6	A	6	A
47	Innes Ave/Earl St	8.6 (sb)	A	23.1 (sb)	C	19.4 (sb)	C	**36.0 (sb)**	**E**	19.7 (sb)	C
48	Evans Ave/Jennings St	10	A	**>80/2.41**	**F**	31	C	43	D	33	C
49	Bayshore Blvd/Geneva Ave	25	C	**>80/1.73**	**F**	**>80/1.76**	**F**	**>80/1.78**	**F**	**>80/1.76**	**F**
50	Bayshore/Guadalupe Pkwy	14	B	50	D	49	D	49	D	49	D
51	Bayshore Blvd/Valley Dr	16	B	40	D	40	D	40	D	40	D
52	Bayshore Blvd/Old County Rd	29	C	**>80/1.10**	**F**	**>80/1.13**	**F**	**>80/1.13**	**F**	**>80/1.13**	**F**
53	Sierra Pt/Lagoon Way	16	C	**>80/4.38**	**F**	**>80/4.38**	**F**	**>80/4.38**	**F**	**>80/4.38**	**F**
54	Ingalls St/Palou Ave [4]	9	A	16	B	22	C	33	C	22	C
55	Keith St/Palou Ave [4]	9	A	8	A	8	A	8	A	8	A
56	Third/Williams/Van Dyke	22	C	17	B	**>80/0.98**	**F**	**>80/1.02**	**F**	**>80/0.98**	**F**
57	Third St/Jerrold Ave	23	C	**>80/0.72**	**F**	**>80/0.88**	**F**	**>80/0.91**	**F**	**>80/0.89**	**F**
58	Evans/Napoleon/Toland	46	D	**>80/1.53**	**F**	**>80/1.61**	**F**	**>80/1.65**	**F**	**>80/1.62**	**F**
59	Harney/Executive Park East	8.9 (sb)	A	25	C	26	C	27	C	27	C
60	Harney/Thomas Mellon	--	--	19	B	26	C	28	C	26	C

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
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Source: Fehr & Peers.

Table 47
Intersection LOS
Project and Project Variants – Sunday PM Peak Hour – 2030 Conditions

	Intersection	Existing		No Project (Alt 1)		Project		Project – Variant 1 (R&D)		Project – Variant 2 (Housing)	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Third St/25th St	13	B	**63/0.57**	**E**	**58/0.70**	**E**	**63/0.76**	**E**	**61/0.74**	**E**
2	Third St/Cesar Chavez St	23	C	31	C	**66/0.73**	**E**	**>80/0.80**	**F**	**>80/0.78**	**F**
3	Third St/Cargo Way	17	B	30	C	30	C	36	D	33	C
4	Third St/Evans Ave	32	C	**57/0.65**	**E**	**59/0.87**	**E**	**63/0.92**	**E**	**67/0.91**	**E**
5	Third St/Oakdale Ave	15	B	14	C	15	B	15	B	15	B
6	Third St/Palou Ave	29	C	**>80/0.92**	**F**	**>80/4.03**	**F**	**>80/4.03**	**F**	**>80/2.51**	**F**
7	Third St/Revere Ave	22	C	20	B	24	C	24	C	24	C
8	Third St/Carroll Ave	9	A	10	B	**55/0.66**	**E**	**70/0.66**	**E**	**60/0.65**	**E**
9	Third St/Paul Ave	21	C	**64/0.73**	**E**	**>80/1.89**	**F**	**>80/1.84**	**F**	**>80/1.82**	**F**
10	Third St/Ingerson Ave	3	A	3	A	27	C	27	C	27	C
11	Third St/Jamestown Ave	21	C	24	C	**>80/1.24**	**F**	**>80/1.12**	**F**	**>80/1.14**	**F**
12	Third/Le Conte/US 101 nb off	12	B	14	B	13	B	14	B	14	B
13	25th St/Illinois St	7	A	10	A	10	A	10	B	10	A
14	25th St/Pennsylvania Ave	10	A	**45/1.01**	**E**	34	C	34	C	34	C
15	Cesar Chavez/Penns/I-280	28	C	**61/0.65**	**E**	**60/0.65**	**E**	**60/0.65**	**E**	**60/0.65**	**E**
16	Cesar Chavez St/Evans Ave	15	B	18	B	19	B	20	B	19	B
17	Cesar Chavez St/Illinois St	14	B	18	B	18	B	18	B	18	B
18	Bayshore Blvd/Paul Ave	12	B	14	B	54	D	**57/1.25**	**E**	55	D
19	Bayshore/Hester/US 101 sb off	14	B	14	B	14	B	14	B	14	B
20	Bayshore Blvd/Tunnel Ave	8	A	53	D	**60/1.59**	**E**	**60/1.59**	**E**	**60/1.59**	**E**
21	Bayshore Blvd/Bacon St	13	B	**63/0.57**	**E**	**58/0.70**	**E**	**63/0.76**	**E**	**61/0.74**	**E**

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.

Source: Fehr & Peers,

Table 47 (continued)
Intersection LOS
Project and Project Variants – Sunday PM Peak Hour – 2030 Conditions

	Intersection	Existing		No Project		Project		Project – Variant 1 (R&D)		Project – Variant 2 (Housing)	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
22	Bayshore Blvd/Arleta St	12	B	17	B	30	C	30	C	30	C
23	Bayshore Blvd/Leland Ave	24	C	54	D	49	D	49	D	49	D
24	Bayshore Blvd/Visitacion Ave	18	B	41	D	38	D	38	D	38	D
25	Bayshore Blvd/Sunnydale Ave	15	B	**64/0.98**	**E**	**70/1.03**	**E**	**69/1.02**	**E**	**69/1.02**	**E**
26	Tunnel Ave/Blanken	19	B	55	D	55	D	55	D	55	D
27	Geneva/U.S. 101 SB Ramps [3]	8	A	30	C	51	D	51	D	51	D
28	Harney/U.S. 101 NB Ramps [3]	8	A	**>80/2.04**	**F**	**>80/2.34**	**F**	**>80/2.37**	**F**	**>80/2.36**	**F**
29	Harney Way/Jamestown Ave [4]	9	A	54	D	**>80/1.36**	**F**	**>80/1.35**	**F**	**>80/1.28**	**F**
30	Crisp Ave/Palou Ave [4]	7	A	22	C	24	C	25	C	24	C
31	Ingalls St/Thomas Ave [4]	11.1 (sb)	B	37	D	46	D	52	D	44	D
32	Ingalls St/Carroll Ave [4]	9.9 (wb)	A	11.8 (wb)	B	26	C	28	C	25	C
33	Ingalls St/Egbert Ave	7	A	9	A	28	C	29	C	27	C
34	A.Walker/Gilman Ave [4]	7	A	8	A	8	A	8	A	8	A
35	Amador St/Cargo Way	8.9 (sb)	A	**72.5 (eb)**	**F**	36	D	36	D	36	D
36	Bayshore Blvd/Cortland Ave	28	C	21	C	20	B	20	B	20	C
37	Bayshore Blvd/Oakdale Ave	17	B	23	C	25	C	25	C	25	C
38	Bayshore/Alemany/Industrial	24	C	21	C	21	C	21	C	21	C
39	Bayshore/US 101 nb off to Cesar	35	D	40	D	52	D	51	D	51	D
40	Bayshore Blvd/Silver Ave	25	C	25	C	26	C	26	C	26	C

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

Table 47 (continued)
Intersection LOS
Project and Project Variants – Sunday PM Peak Hour – 2030 Conditions

	Intersection	Existing		No Project		Project		Project – Variant 1 (R&D)		Project – Variant 2 (Housing)	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
41	Bayshore Blvd/Blanken Ave	9	A	51	D	**68/1.16**	**E**	**68/1.16**	**E**	**68/1.16**	**E**
42	San Bruno Ave/Paul Ave	16	B	39	D	**>80/1.46**	**F**	**>80/1.37**	**F**	**>80/1.36**	**F**
43	San Bruno Ave/Silver Ave	41	D	**>80/1.29**	**F**	**>80/1.40**	**F**	**>80/1.38**	**F**	**>80/1.37**	**F**
44	San Bruno/Mansell/101 sb off	16	C	27	D	**38/1.00**	**E**	**36/0.98**	**E**	**36/0.98**	**E**
45	San Bruno/Silliman/101 sb off	17	B	**78/0.36**	**E**	**70/0.37**	**E**	**77/0.36**	**E**	**77/0.36**	**E**
46	Innes Ave/A.Walker Drive [4]	8.5 (sb)	A	4	A	6	A	5	A	5	A
47	Innes Ave/Earl St	8.5 (sb)	A	9.9 (sb)	A	10 (sb)	B	11.0 (sb)	B	10.5 (sb)	B
48	Evans Ave/Jennings St	8	A	33	D	20	C	21	C	20	C
49	Bayshore Blvd/Geneva Ave	20	C	44	D	43	D	43	D	43	D
50	Bayshore/Guadalupe Pkwy	10	B	9	A	9	A	9	A	9	A
51	Bayshore Blvd/Valley Dr	11	B	10	A	10	A	10	A	10	B
52	Bayshore Blvd/Old County Rd	26	C	43	D	42	D	42	D	42	D
53	Sierra Pt/Lagoon Way	8	A	43	D	**44/1.01**	**E**	**44/1.01**	**E**	**44/1.01**	**E**
54	Ingalls St/Palou Ave [4]	8	A	16	B	22	C	21	C	20	C
55	Keith St/Palou Ave [4]	8	A	10	B	7	A	7	A	8	A
56	Third/Williams/Van Dyke	22	C	14	B	23	C	23	C	23	C
57	Third St/Jerrold Ave	21	C	23	C	31	C	37	D	34	C
58	Evans/Napoleon/Toland	32	C	**57/0.50**	**E**	**60/0.57**	**E**	**60/0.58**	**E**	**60/0.58**	**E**
59	Harney/Executive Park East	8.8 (eb)	A	18	B	22	C	16	B	15	B
60	Harney/Thomas Mellon	--	--	15	B	19	B	16	B	15	B

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

Table 48
Summary of Impacts at Intersections Operating at LOS E or LOS F

	Intersection	Project	P-Var 1 (R&D)	P-Var 2 (Housing)	Alt 1 No Project	Alt 2 No Bridge	Alt. 3 49ers at Stick	Alt 4 Lesser Build	Alt 5 No Park Agree
1	Third St/25th St	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
2	Third St/Cesar Chavez St	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
3	Third St/Cargo Way	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
4	Third St/Evans Ave	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
5	Third St/Oakdale Ave	PI	PI	PI	--	PI	--	--	PI
6	Third St/Palou Ave	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
7	Third St/Revere Ave	PI	PI	PI	--	PI	--	PI	PI
8	Third St/Carroll Ave	PI	PI	PI	--	PI	--	PI	PI
9	Third St/Paul Ave	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
10	Third St/Ingerson Ave	--	--	--	--	--	--	--	--
11	Third St/Jamestown Ave	PI	PI	PI	--	PI	--	PI	PI
12	Third/Le Conte/US 101 nb off	--	--	--	--	--	--	--	--
13	25th St/Illinois St	--	--	--	--	--	--	--	--
14	25th St/Pennsylvania Ave	--	--	--	NP Impact	--	--	--	--
15	Cesar Chavez/Penns/I-280	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
16	Cesar Chavez St/Evans Ave	NSC	SC/PI	SC/PI	NP Impact	NSC	SC/PI	NSC	SC/PI
17	Cesar Chavez St/Illinois St	--	--	--	--	--	--	--	--
18	Bayshore Blvd/Paul Ave	PI	PI	PI	NP Impact	PI	SC/PI	PI	PI
19	Bayshore/Hester/US 101 sb off	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC
20	Bayshore Blvd/Tunnel Ave	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC

Notes:
1. PI – Project Impact. Project results in a change in intersection operations from LOS D or better under 2030 No Project conditions, to LOS E or LOS F with the Project, Project Variants, or Project Alternatives, or from LOS E under 2030 No Project conditions to LOS F with the Project, Project Variants or Alternatives.
2. NSC – No Significant Contribution. Project would not contribute significantly to intersections operating at LOS E or LOS F under 2030 No Project conditions. No impacts.
3. SC/PI – Significant Contribution/Project Impact. Project would contribute significantly to intersections that would be operating at LOS E or LOS F under 2030 No Project conditions, resulting in a Project Impact.
4. NP Impact – No Project Impact. Intersection operations change from LOS D or better under existing conditions to LOS E or LOS F under 2030 No Project conditions, or from LOS E under existing conditions to LOS F under 2030 No Project conditions.
Source: Fehr & Peers.

Table 48 (continued)
Summary of Impacts at Intersections Operating at LOS E or LOS F

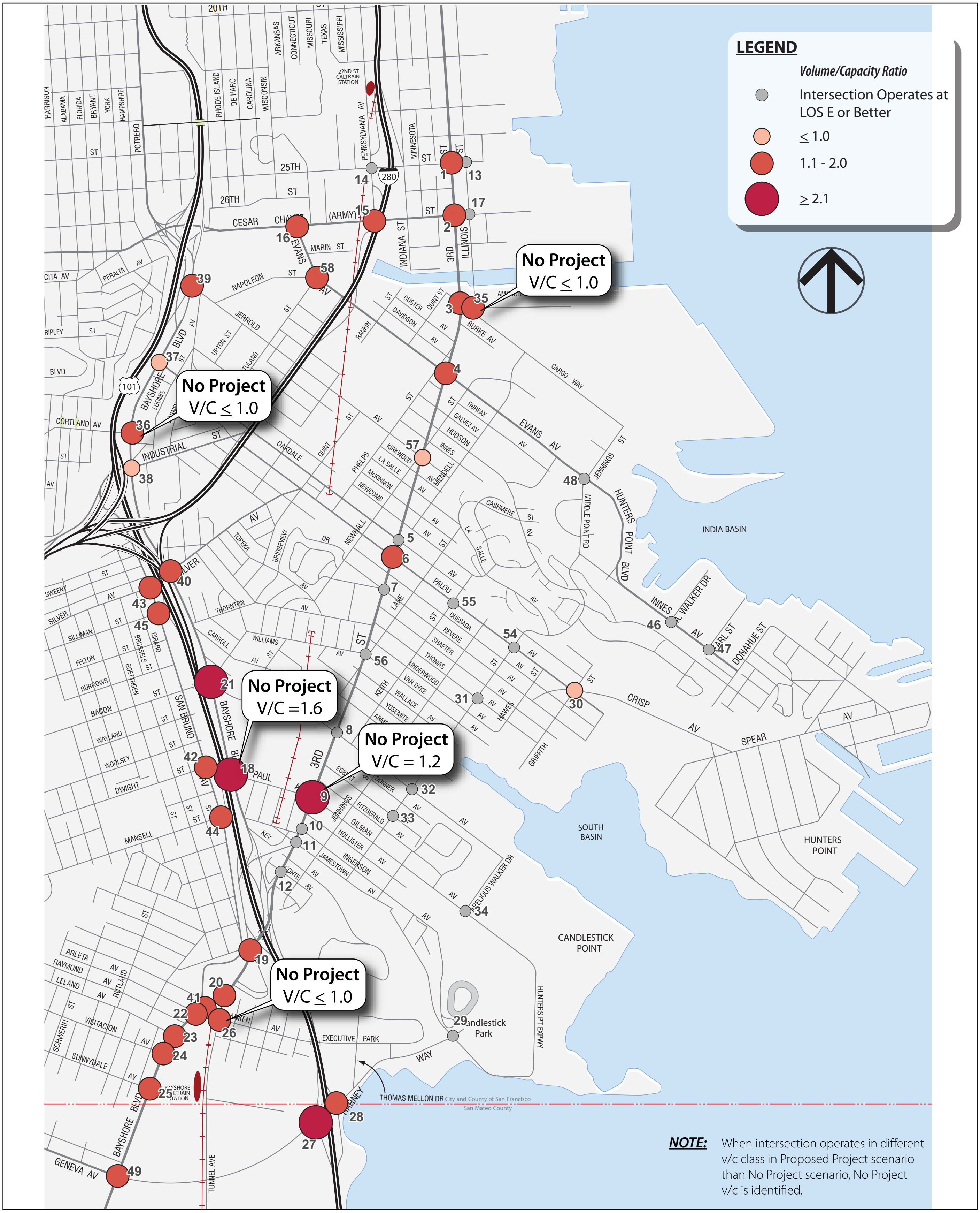
	Intersection	Project	P-Var 1 (R&D)	P-Var 2 (Housing)	Alt 1 No Project	Alt 2 No Bridge	Alt. 3 49ers at Stick	Alt 4 Lesser Build	Alt 5 No Park Agree
21	Bayshore Blvd/Bacon St	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
22	Bayshore Blvd/Arleta St	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC
23	Bayshore Blvd/Leland Ave	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC
24	Bayshore Blvd/Visitacion Ave	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	NSC	NSC	SC/PI
25	Bayshore Blvd/Sunnydale Ave	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	NSC	NSC	SC/PI
26	Tunnel Ave/Blanken	PI	PI	PI	NP Impact	PI	--	PI	PI
27	Geneva/U.S. 101 SB Ramps	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
28	Harney/U.S. 101 NB Ramps	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	NSC	SC/PI	SC/PI
29	Harney Way/Jamestown Ave	--	--	--	NP Impact	--	PI	--	--
30	Crisp Ave/Palou Ave	--	PI	--	NP Impact	--	--	--	--
31	Ingalls St/Thomas Ave	--	--	--	--	--	PI	--	--
32	Ingalls St/Carroll Ave	--	PI	--	--	--	--	--	--
33	Ingalls St/Egbert Ave	--	--	--	--	--	--	--	--
34	A.Walker/Gilman Ave	--	--	--	NP Impact	--	SC/PI	--	--
35	Amador St/Cargo Way	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	--	SC/PI
36	Bayshore Blvd/Cortland Ave	PI	PI	PI	NP Impact	PI	NSC	PI	PI
37	Bayshore Blvd/Oakdale Ave	--	PI	PI	--	--	--	--	PI
38	Bayshore/Alemany/Industrial	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
39	Bayshore/US 101 nb off to Cesar	PI	PI	PI	NP Impact	PI	NSC	SC/PI	PI
40	Bayshore Blvd/Silver Ave	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC

Notes:
1. PI – Project Impact. Project results in a change in intersection operations from LOS D or better under 2030 No Project conditions, to LOS E or LOS F with the Project, Project Variants, or Project Alternatives, or from LOS E under 2030 No Project conditions to LOS F with the Project, Project Variants or Alternatives.
2. NSC – No Significant Contribution. Project would not contribute significantly to intersections operating at LOS E or LOS F under 2030 No Project conditions. No impacts.
3. SC/PI – Significant Contribution/Project Impact. Project would contribute significantly to intersections that would be operating at LOS E or LOS F under 2030 No Project conditions, resulting in a Project Impact.
4. NP Impact – No Project Impact. Intersection operations change from LOS D or better under existing conditions to LOS E or LOS F under 2030 No Project conditions, or from LOS E under existing conditions to LOS F under 2030 No Project conditions.
Source: Fehr & Peers.

Table 48 (continued)
Summary of Impacts at Intersections Operating at LOS E or LOS F

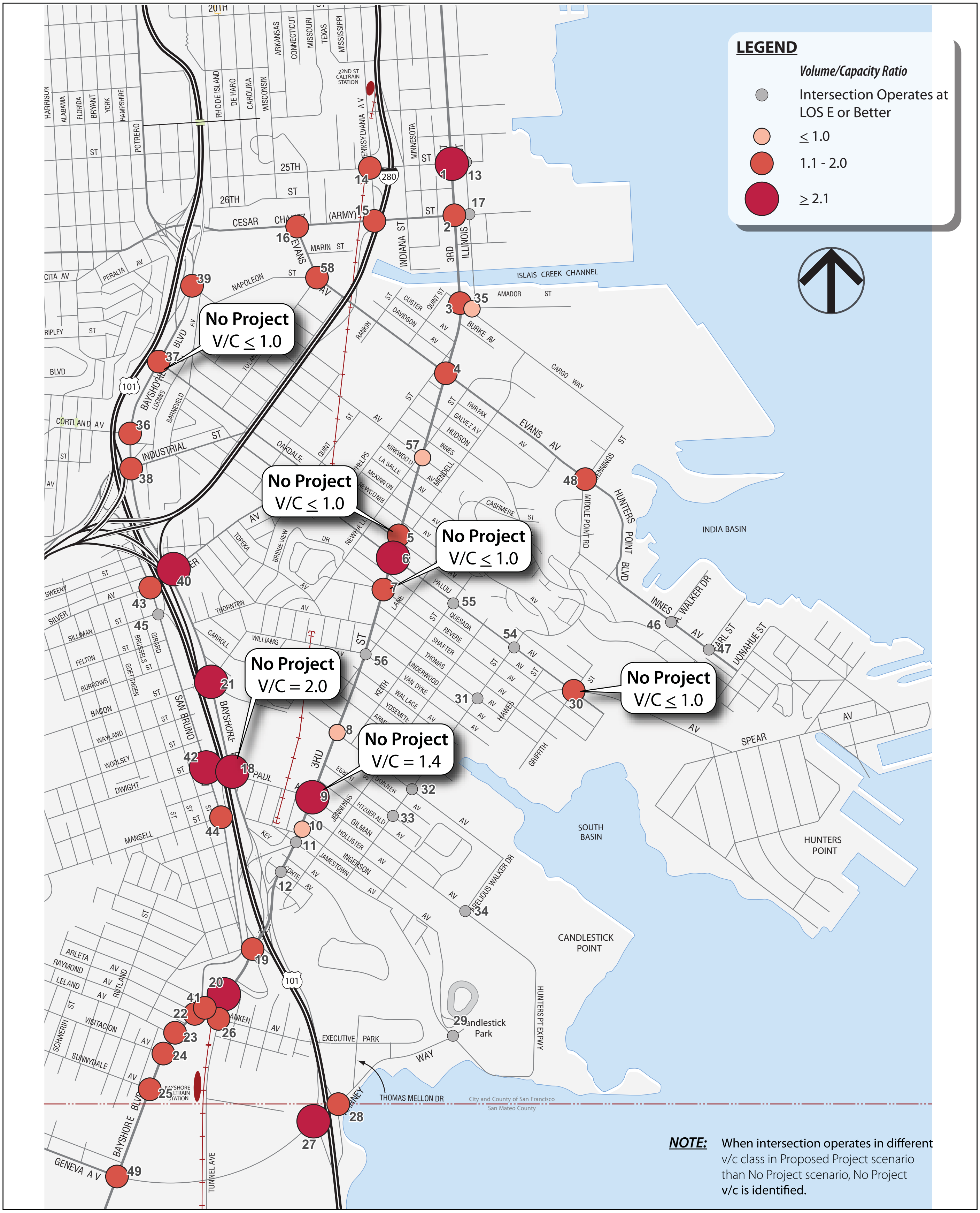
	Intersection	Project	P-Var 1 (R&D)	P-Var 2 (Housing)	Alt 1 No Project	Alt 2 No Bridge	Alt. 3 49ers at Stick	Alt 4 Lesser Build	Alt 5 No Park Agree
41	Bayshore Blvd/Blanken Ave	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	NSC	NSC	SC/PI
42	San Bruno Ave/Paul Ave	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	NSC	SC/PI	SC/PI
43	San Bruno Ave/Silver Ave	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
44	San Bruno/Mansell/101 sb off	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	NSC	SC/PI	SC/PI
45	San Bruno/Silliman/101 sb off	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC
46	Innes Ave/A.Walker Drive	--	--	--	--	--	--	--	--
47	Innes Ave/Earl St	--	PI	--	--	--	--	--	--
48	Evans Ave/Jennings St	--	SC/PI	--	NP Impact	--	--	--	--
49	Bayshore Blvd/Geneva Ave	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
50	Bayshore/Guadalupe Pkwy	--	--	--	--	--	--	--	--
51	Bayshore Blvd/Valley Dr	--	--	--	--	--	--	--	--
52	Bayshore Blvd/Old County Rd	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC
53	Sierra Pt/Lagoon Way	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC
54	Ingalls St/Palou Ave [4]	--	--	--	--	--	--	--	--
55	Keith St/Palou Ave [4]	--	--	--	--	--	--	--	--
56	Third/Williams/Van Dyke	PI	PI	PI	--	PI	--	PI	PI
57	Third St/Jerrold Ave	PI	PI	PI	NP Impact	PI	PI	PI	PI
58	Evans/Napoleon/Toland	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
59	Harney/Executive Park East	--	--	--	--	--	--	--	--
60	Harney/Thomas Mellon	--	--	--	--	--	--	--	--

Notes:
1. PI – Project Impact. Project results in a change in intersection operations from LOS D or better under 2030 No Project conditions, to LOS E or LOS F with the Project, Project Variants, or Project Alternatives, or from LOS E under 2030 No Project conditions to LOS F with the Project, Project Variants or Alternatives.
2. NSC – No Significant Contribution. Project would not contribute significantly to intersections operating at LOS E or LOS F under 2030 No Project conditions. No impacts.
3. SC/PI – Significant Contribution/Project Impact. Project would contribute significantly to intersections that would be operating at LOS E or LOS F under 2030 No Project conditions, resulting in a Project Impact.
4. NP Impact – No Project Impact. Intersection operations change from LOS D or better under existing conditions to LOS E or LOS F under 2030 No Project conditions, or from LOS E under existing conditions to LOS F under 2030 No Project conditions.
Source: Fehr & Peers.



SOURCE: Fehr & Peers

FIGURE 33: LOS OPERATING CONDITIONS AT STUDY INTERSECTIONS - WEEKDAY AM PEAK HOUR NO PROJECT AND PROPOSED PROJECT CONDITIONS



SOURCE: Fehr & Peers

FIGURE 34: LOS OPERATING CONDITIONS AT STUDY INTERSECTIONS - WEEKDAY PM PEAK HOUR NO PROJECT AND PROPOSED PROJECT CONDITIONS

Traffic signals at intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels of LOS D or better.

To accommodate additional right-of-way needed for additional lanes, Third Street would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition, or reduction in corner sidewalk width and prohibition of on-street parking along Third Street. Widening Third Street or reducing the corner sidewalk space at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions, the measure was not further considered. Traffic impacts at this intersection under the Project conditions would remain *significant and unavoidable*.

7. Third/Revere - At the signalized intersection of Third/Revere, the intersection operating conditions would worsen in the PM peak hour from LOS D under 2030 No Project conditions to LOS F with the Project.

The degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Third Street. Due to the presence of the Third Street light rail, space for additional travel lanes could not be taken from the center median. Parking is generally permitted on either side of the street; however, it is not permitted at the intersections. Instead, sidewalks are extended to increase the pedestrian waiting area at the intersection and reduce the pedestrian crossing distances.

Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels.

To accommodate additional right-of-way needed for additional lanes, Third Street would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition, or reduction in corner sidewalk width and prohibition of on-street parking along Third Street. Widening Third Street or reducing the corner sidewalk space at this location would be inconsistent with the pedestrian environment created by the Third Street

Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions, the measure was not further considered. Traffic impacts at this intersection under the Project conditions would remain *significant and unavoidable*.

8. Third/Carroll - At the signalized intersection of Third/Carroll, the intersection operating conditions would worsen in the PM peak hour from LOS B under 2030 No Project conditions to LOS E with the Project.

The degradation in level of service would primarily be due to Project-related traffic increases on Carroll Avenue and Third Street. Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels. To accommodate additional right-of-way needed for additional lanes, Third Street would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition, or reduction in corner sidewalk width and prohibition of on-street parking along Third Street. Widening Third Street or reducing the corner sidewalk space at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions, the measure was not further considered. Traffic impacts at this intersection under the Project conditions would remain *significant and unavoidable*.

11. Third/Jamestown - At the signalized intersection of Third/Jamestown, the intersection operating conditions would worsen in the AM and PM peak hours from LOS C under 2030 No Project conditions to LOS F with the Project.

The degradation in level of service would primarily be due to project-related traffic increases on Jamestown Avenue and Third Street. Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels.

To accommodate additional right-of-way needed for additional lanes, Third Street would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition, or reduction in corner sidewalk width and prohibition of on-street parking along Third Street. Widening Third Street or reducing the corner sidewalk space at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions, the measure was not further considered. Traffic impacts at this intersection under the Project conditions would remain *significant and unavoidable*.

18. Bayshore/Paul – At the signalized intersection of Bayshore/Paul, the intersection operating conditions would worsen in the AM peak hour from LOS E under 2030 No Project conditions to LOS F with the Project. In the PM peak hour, intersection conditions would remain at LOS E.

The degradation in level of service would primarily be due to forecasted traffic volume increases on Paul Avenue. Paul Avenue is one of a relatively few number of streets in the area that connects between the east and west side of U.S. 101. As a result, east-west travel in the area is concentrated to the few streets that provide connections across the freeway, including Paul Avenue. Widening Paul Avenue at this intersection would create the need for major right-of-way acquisition and likely require reconstruction of the U.S. 101 overpass to accommodate a wider Paul Avenue cross section, which would be infeasible. Therefore Project-related impacts at this intersection would remain *significant and unavoidable*.

26. Tunnel/Blanken – At the signalized intersection of Tunnel/Blanken (currently unsignalized and required to be signalized as part of the Visitacion Valley Redevelopment), the intersection operating conditions would worsen in the AM peak hour from LOS D under 2030 No Project conditions to LOS F with the Project. In the PM peak hour, the intersection would operate at LOS F under 2030 No Project and with the Project conditions.

> ***Project Mitigation Measure 2***: Reconfigure the northbound and southbound approaches to the intersection of Tunnel/Blanken to provide dedicated left-turn lanes adjacent to shared through/right-turn lanes. This reconfiguration would require prohibition of parking for 160 feet in the southbound approach (loss of eight parking spaces) and for 100 feet in the northbound approach (loss of five parking spaces).
>
> Implementation of the intersection reconfiguration shall be the responsibility of SFMTA, and shall be implemented when intersection improvements associated with the Visitacion Valley Redevelopment Plan (i.e., signalization) are no longer sufficient to maintain acceptable intersection level of service conditions. Since these improvements were determined to be required even without the Project under 2030 No Project conditions, the Project Applicant shall contribute its fair-share toward the cost of improvements. Prior to payment of the contribution, the City shall create a mechanism to determine and receive

fair share contributions from the Project Applicant. The SFMTA and DPW shall design and implement the measure as necessary.

With implementation of ***Project Mitigation Measure 2***, operations at this intersection would improve, but not to acceptable LOS D or better conditions in the AM and PM peak hours. Therefore, Project-related impacts at this intersection would be *significant and unavoidable*.

36. Bayshore/Cortland - At the signalized intersection of Bayshore/Cortland, the intersection operating conditions would worsen in the AM peak hour from LOS D under 2030 No Project conditions to LOS F with the Project. In the PM peak hour, the intersection would operate at LOS F under 2030 No Project and with the Project conditions.

The degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Bayshore Boulevard. Mitigation for this impact would require increasing capacity on Bayshore Boulevard. There is not sufficient right-of-way to provide additional lanes on Bayshore Boulevard without widening the roadway. Roadway widening would require major right-of-way acquisition along the entire Bayshore Boulevard corridor, at great cost and displacement of existing homes and businesses. Therefore, Project-related impacts at this intersection would remain *significant and unavoidable*.

39. Bayshore/US 101 Northbound off-ramp/Jerrold - At the signalized intersection of Bayshore/US 101 Northbound off-ramp to Cesar Chavez, the intersection operating conditions would worsen in the AM peak hour from LOS E under 2030 No Project conditions to LOS F with the Project. The intersection would operate at LOS F in the PM peak hour under 2030 No Project with the Project conditions.

The degradation in level of service would primarily be due to forecasted substantial traffic volume increases on all approaches to the intersection. Mitigation for this impact would involve increasing capacity on Bayshore Boulevard, the U.S. 101 Northbound Off-ramp, and Jerrold Street. There is not adequate right-of-way to provide additional lanes on Bayshore Boulevard or Jerrold Street without widening the roadway. Roadway widening to provide measurable improvements at this intersection would require major right-of-way acquisition along the entire Bayshore Boulevard and Jerrold Street corridor, at great cost and displacement of existing homes and businesses (It may be possible to widen the U.S. 101 Northbound off-ramp, but only for the last 150 to 200 feet of the approach to the intersection. This would not likely result in a substantial improvement to the intersection capacity.) Therefore, Project-related impacts at this intersection would remain *significant and unavoidable*.

56. Third/Williams/Van Dyke - At the signalized intersection of Third/Williams/Van Dyke, the intersection operating conditions would worsen in the PM peak hour from LOS B under 2030 No

Project conditions to LOS F with the Project. The Project would create a significant traffic impact at this intersection.

The degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Third Street. Due to the presence of the Third Street light rail, space for additional travel lanes could not be taken from the center median, and parking is not permitted on either side of the street. Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels.

To accommodate additional right-of-way needed for additional lanes, Third Street would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition. Widening Third Street at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and the right-of-way constraints, the measure was not further considered. The Project's traffic impacts at this intersection would remain *significant and unavoidable*.

57. Third/Jerrold - At the signalized intersection of Third/Jerrold, the intersection operating conditions would worsen in the AM peak hour from LOS D under 2030 No Project conditions to LOS F with the Project. In the PM peak hour, the intersection would operate at LOS F under 2030 No Project and with the Project conditions.

The degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Third Street. Due to the presence of the Third Street light rail, space for additional travel lanes could not be taken from the center median, and parking is not permitted on either side of the street. Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels.

To accommodate additional right-of-way needed for additional lanes, Third Street would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition. Widening Third Street at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and right-of-way constraints, the measure was not further considered. Therefore, Project-related impacts at this intersection would remain *significant and unavoidable*.

Project Cumulatively-Considerable Traffic Impacts

At the remaining 29 of the 39 intersections that would operate at LOS E or LOS F under Project conditions, Project contributions were determined to be significant at 20 intersections, and less than significant at 9 intersections (as identified in **Table 48**).

At the following four intersections, feasible mitigation measures were identified:

27. Geneva/U.S. 101 southbound ramps (existing Alana/Beatty)
28. Harney/U.S. 101 northbound ramps (existing Alana/Harney/Thomas Mellon)
35. Amador/Cargo/Illinois
49. Bayshore/Geneva

27. Geneva/U.S. 101 Southbound Ramps (existing Alana/Beatty)
28. Harney/U.S. 101 Northbound Ramps (existing Alana/Harney/Thomas Mellon)

The City of Brisbane, in consultation with the City of San Francisco, is currently evaluating a proposal to extend Geneva Avenue from its current terminus at Bayshore Boulevard to U.S. 101. The extension of Geneva Avenue would connect to Harney Way to the east. The proposed roadway improvement would include a reconstruction of the existing U.S. 101/Harney/Alana interchange (see Section 4.3 above for a description of the proposed improvements). As a result of this roadway modification, the intersections of Alana/Beatty and Alana/Harney/Thomas Mellon would be reconstructed into a tight diamond freeway interchange. Based on the currently-proposed configuration of this roadway, the new intersections of Geneva/U.S. 101 southbound ramps and Harney/U.S. 101 northbound ramps would operate at LOS F during the weekday peak hours, and additional capacity would be needed on the off-ramp approaches to Geneva Extension and Harney Way.

> ***Project Mitigation Measure 3*****:** The City of Brisbane and Caltrans, as part of the Harney Interchange Project, shall account for existing traffic, background traffic growth, and the most recent forecasts of traffic expected to be associated with each of several adjacent development projects, including the Project. The San Francisco County Transportation Authority (SFCTA) shall coordinate with the City of Brisbane and Caltrans to ensure Project-generated vehicle trips are accounted for in the Harney Interchange analyses and design.

Mitigations and associated fair-share funding measures for cumulative regional roadway system impacts, including freeway segment impacts, shall be formulated through the current interjurisdictional Bi-County Transportation Study effort being led by the SFCTA. The Project Applicant shall contribute its fair share to the Harney Interchange Project.

Because the environmental review of the interchange project is not yet complete and the interchange would be approved by Caltrans, the implementation of **Project Mitigation Measure 3** is uncertain and is outside of the City/Agency jurisdiction. Therefore, Project-related contributions to cumulative traffic impacts at these two intersections would remain *significant and unavoidable*.

35. Amador/Cargo/Illinois – At the signalized intersection of Amador/Cargo/Illinois, the degradation in LOS at this intersection would primarily be due to increased traffic volumes and delays to the southbound approach on Illinois Street. As travel on Third Street becomes more congested, as expected in the future, Illinois Street would become a desirable alternate and parallel route. Because this intersection represents the southern terminus of Illinois Street, a relatively large volume of southbound traffic turns onto Cargo Way.

To mitigate the poor operating conditions at this intersection, the southbound approach of Illinois Street to Amador/Cargo would need to be reconfigured to provide a dedicated southbound left-turn lane and a dedicated right-turn lane. Sufficient right-of-way is available to implement this improvement, however, provision of two southbound lanes would require narrowing a portion of the island to the west of the southbound approach to Cargo Way.

Project Mitigation Measure 4: SFMTA shall conduct a feasibility study of the intersection of Amador/Cargo/Illinois with the Port of San Francisco to determine the feasibility of reconfiguring the southbound approach on Illinois Street to provide a dedicated southbound left turn lane and a dedicated right-turn lane. Sufficient right-of-way is available to implement this improvement, however, provision of two southbound lanes would require narrowing a portion of the island to the west of the southbound approach to Cargo Way. Implementation of the intersection improvements shall be the responsibility of SFMTA and the Port of San Francisco, and shall be implemented when traffic operating conditions with the existing intersection configuration worsens to unacceptable levels. If determined feasible, the Project Applicant shall contribute its fair share to the intersection improvements.

With implementation of **Project Mitigation Measure 4,** operations at this intersection would improve to acceptable LOS C conditions during the AM and PM peak hours. However, since a feasibility study would be required, implementation of Mitigation Measure 4 is uncertain, and therefore, Project-related impacts at this intersection would remain *significant and unavoidable.*

49. Bayshore/Geneva – The City of Brisbane, in consultation with the City of San Francisco, is currently evaluating a proposal to extend Geneva Avenue from its current terminus at Bayshore Boulevard to U.S. 101. The extension of Geneva Avenue would connect to Harney Way to the east. The proposed roadway improvement would include a reconstruction of the existing U.S. 101/Harney/Alana interchange. As a result of this roadway modification, the intersection of Bayshore/Geneva would include a fourth leg, east of Bayshore Boulevard. To mitigate the poor operating conditions at this intersection, the proposed intersection design would need to be modified to provide three westbound through lanes on Geneva Avenue through the Bayshore Boulevard intersection. To accommodate three "receiving" lanes on the west side of Bayshore Boulevard, eliminate on-street parking between Bayshore Boulevard and Talbert Street (approximately 550 feet).

> ***Project Mitigation Measure 5***: The City of Brisbane, as part of the Geneva Avenue Extension Project, shall account for existing traffic, background traffic growth, and the most recent forecasts of traffic expected to be associated with each of several adjacent development projects, including the Project. The San Francisco County Transportation Authority (SFCTA) and SFMTA shall coordinate with the City of Brisbane to ensure projected traffic volumes are accounted for in the design of the Geneva Avenue Extension.
>
> Mitigations and associated fair-share funding measures for cumulative regional roadway system impacts, including freeway segment impacts, shall be formulated through the current interjurisdictional Bi-County Transportation Study effort being led by the SFCTA. The Project Applicant shall contribute its fair share to the Geneva Avenue Extension Project.

Since implementation of Project Mitigation Measure 5 would be under the jurisdiction of the City of Brisbane, the implementation of the mitigation measure is uncertain. Therefore, the Project-related impacts at this intersection would remain *significant and unavoidable.*

Of the 20 intersections where Project contributions were determined to be significant, feasible mitigation measures were not identified at 16 intersections, and therefore project-related impacts at these intersections would remain *significant and unavoidable*. The 16 study intersections where feasible mitigation measures have not been identified are:

1. Third/25th
2. Third/Cesar Chavez
3. Third/Cargo
4. Third/Evans
6. Third/Palou
9. Third/Paul

15. Cesar/Pennsylvania/I-280
21. Bayshore/Bacon
24. Bayshore/Visitacion
25. Bayshore/Sunnydale
38. Bayshore/Alemany/Industrial
41. Bayshore/Blanken
42. San Bruno/Paul
43. San Bruno/Silver
44. San Bruno/Mansell/U.S. 101 Southbound Off-ramp
58. Evans/Napoleon/Toland

1. Third/25th – At the signalized intersection of Third/25th, the degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Third Street. Due to the presence of the Third Street light rail, space for additional travel lanes could not be taken from the center median, and parking is not permitted on either side of the street. Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be sufficient to improve intersection operating conditions to acceptable levels.

To accommodate additional right-of-way needed for additional lanes, Third Street and 25th Street would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition. Widening Third Street at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and due to the right-of-way constraints, the measure was not further considered.

Alternatively, the eastbound and westbound approaches on 25th Street could be re-striped to provide separate left-turn lanes. This may shorten the amount of green time needed for the 25th Street movement and allow more time for Third Street traffic. However, this would require a narrowing of the "receiving" lane on 25th Street. Given the relatively high portion of truck traffic using this road, the narrow receiving lane may not physically accommodate the required truck turning movements and this mitigation measure was not considered further. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

2. Third/Cesar Chavez - To mitigate the significant impacts at the signalized intersection of Third/Cesar, additional capacity would need to be provided on both Third Street and Cesar Chavez Street. Due to the presence of the Third Street light rail, space for additional travel lanes could not be taken from the center median on Third Street, and parking is not permitted on either side of the street. Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels of LOS D or better.

To accommodate additional right-of-way needed for additional lanes, Third Street and Cesar Chavez Street would need to be widened to the east, south, and north. This would require demolition of existing structures and substantial right-of-way acquisition. Widening Third Street at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and due to right-of-way constraints, the measure was not further considered, and Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

3. Third/Cargo - At the signalized intersection of Third Street/Cargo Way, the degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Third Street. Due to the presence of the Third Street light rail, space for additional travel lanes could not be taken from the center median, and parking is not permitted on either side of the street. Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels of LOS D or better.

To accommodate additional right-of-way needed for additional lanes, Third Street would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition. Widening Third Street at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and due to the right-of-way constraints, the measure was not further considered. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

4. Third/Evans - Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels of LOS D or better.

To achieve acceptable operations, additional capacity would need to be provided on Third Street and/or Evans Avenue. To accommodate additional right-of-way needed for additional lanes on either Third Street or Evans Avenue, the roadways would need to be widened to the north, south, east and the west. This would require demolition of existing structures and substantial right-of-way acquisition. Widening Third Street or Evans Avenue at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street or Evans Avenue would make the pedestrian crossings at the intersection longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and due to the right-of-way constraints, the measure was not further considered.

Another option to achieve acceptable operations at this intersection would be to provide grade separation, whereby Evans Avenue travels either above or below Third Street, and the existing signalized intersection would be eliminated. This option would have similar degradation to the pedestrian environment by reducing pedestrian connectivity between the two streets and creating new grades for pedestrians and cyclists to cross through the intersection. This measure was not further considered. Therefore, Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

6. Third/Palou - At the signalized intersection of Third/Palou, the degradation in level of service is primarily due to forecasted substantial traffic volume increases on Third Street. Due to the presence of the Third Street light rail, space for additional travel lanes could not be taken from the center median. Parking is generally permitted on either side of the street; however it is not permitted at the intersections. Instead, sidewalks are extended to increase the pedestrian waiting area at the intersection and reduce the pedestrian crossing distances.

Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels of LOS D or better.

To accommodate additional right-of-way needed for additional lanes, Third Street would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition, or reduction in corner sidewalk width and prohibition of on-street parking along Third Street. Widening Third Street or reducing the corner sidewalk space at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and due to the right-of-way constraints, the measure was not further considered. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

9. Third/Gilman/Paul - At the signalized intersection of Third/Gilman/Paul, the degradation in level of service would primarily be due to substantial traffic volume increases on Third Street. In addition, Paul Avenue is one of a relatively few number of streets in the area that connects to the west side of U.S. 101. As a result, east-west travel in the area is concentrated to the few streets that provide connections across the freeway.

Due to the presence of the Third Street light rail, space for additional travel lanes on Third Street could not be taken from the center median, and parking is not permitted on either side of the street. Traffic signals on intersections along Third Street are timed to prioritize transit movements along Third Street. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third Street that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels LOS D or better.

To accommodate additional right-of-way needed for additional lanes, Third Street would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition. Widening Third Street at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Third Street would make the pedestrian crossing of Third Street longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and due to the right-of-way constraints, the measure was not further considered.

Widening Paul Avenue at this intersection would create the need for similar right-of-way acquisition and would cause similar inconsistencies with the desired pedestrian environment in the area. Further, widening Paul Avenue just at the Third Street intersection would not substantially address the problem created by limited vehicular capacity across U.S. 101. Widening Paul Avenue from Third Street to San Bruno Avenue, just west of US 101 would be required. However, this would require major right-of-way acquisition along the entire Paul Avenue corridor between Third Street and Bayshore Boulevard. Therefore, increased vehicular capacity along Paul Avenue was not considered further. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

15. Cesar Chavez/Pennsylvania/I-280 Northbound Off-Ramp - At the signalized intersection of Cesar Chavez/Pennsylvania/I-280 Northbound off-ramp, the degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Cesar Chavez Street, and increases in off-ramp traffic. The transportation and engineering analysis conducted by the San Francisco Department of Public Works for the *Bayview Transportation Improvements Project* (BTI Project) identified a potential mitigation measure at this intersection that would provide an additional dedicated eastbound left-turn lane. To accomplish this, the existing travel lanes would need to be narrowed to 10 and 11 feet, and the north sidewalk would be narrowed from eight to six feet.

The reduction in width of travel lanes and sidewalk narrowing would degrade conditions for westbound cyclists because the curbside travel lane would be too narrow to comfortably share with a motor vehicle. In addition, the mitigation measure would make it more difficult to add a bicycle lane on Cesar Chavez Street in the future, as is currently planned. For these reasons, consistent with the BTI Project analysis, this mitigation measure was not considered further. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

21. Bayshore/Bacon/Egbert/Phelps - At the signalized intersection of Bayshore/Bacon/ Egbert/Phelps, the degradation in level of service is primarily due to forecasted substantial traffic volume increases on Bayshore Boulevard and due to the fact that Bacon Street is one of a relatively few streets in the area that connects across U.S. 101. As a result, all approaches to the intersection would become congested and would require increased capacity.

Widening Bayshore Boulevard would require major right-of-way acquisition and demolition of existing structures. Widening Bacon Avenue would require similar right-of-way acquisition and reconstruction of the U.S. 101 overcrossing. Capacity constraints at Phelps Street and Egbert Avenue are primarily due to the relationship between the street grid east of Bayshore Boulevard and Bayshore Boulevard itself. Because these two streets meet at Bayshore Boulevard, widening either one of them would not alleviate congestion on this approach, which is primarily due to the awkward position of the streets relative to the intersection.

Because the potential mitigation measures would be infeasible to construct economically and without displacing existing homes, the measure was not further considered. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

24. Bayshore/Visitacion - At the signalized intersection of Bayshore/Visitacion, the degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Bayshore Boulevard. Due to the presence of the T-Third light rail, space for additional travel lanes could not be taken from the center median, and parking is permitted only intermittently on either side of the street. Traffic signals on intersections along Bayshore Boulevard are timed to prioritize transit movements along Bayshore Boulevard. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Bayshore Boulevard that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels of LOS D or better.

To accommodate additional right-of-way needed for additional lanes, Bayshore Boulevard would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition. Widening Bayshore Boulevard at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Bayshore Boulevard would make the pedestrian crossing of Bayshore Boulevard longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and due to the right-of-way constraints, the measure was not further considered. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

25. Bayshore/Sunnydale - At the signalized intersection of Bayshore/Sunnydale, the degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Bayshore Boulevard. Due to the presence of the T-Third light rail, space for additional travel lanes could not be taken from the center median, and parking is permitted only intermittently on either side of the street. Traffic signals on intersections along Bayshore Boulevard are timed to prioritize transit movements along Bayshore Boulevard. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Bayshore Boulevard that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels of LOS D or better.

To accommodate additional right-of-way needed for additional lanes, Bayshore Boulevard would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition. Widening Bayshore Boulevard at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Bayshore Boulevard would make the pedestrian crossing of Bayshore Boulevard longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and due to the right-of-way constraints, the measure was not further considered. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

38. Bayshore/Alemany/Industrial - At the signalized intersection of Bayshore/Alemany/ Industrial, the degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Bayshore Boulevard. Mitigation for this impact would involve increasing capacity on Bayshore Boulevard. There is not adequate right-of-way to provide additional lanes on Bayshore Boulevard without widening the roadway. Roadway widening would require major right-of-way acquisition along the entire Bayshore Boulevard corridor, at great cost and displacement of existing homes and businesses, and therefore, no feasible mitigation measures have been identified. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

41. Bayshore/Blanken - At the signalized intersection of Bayshore/Blanken, the degradation in level of service would primarily due to forecasted substantial traffic volume increases on Bayshore Boulevard. To mitigate the impact at this intersection, additional capacity would be needed on Bayshore Boulevard. Due to the presence of the T-Third light rail, space for additional travel lanes could not be taken from the center median. Although parking is permitted on the east side of the street, it is not permitted on the west side.

Traffic signals on intersections along Third Street and Bayshore Boulevard south of U.S. 101 are timed to prioritize transit movements along Bayshore Boulevard. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Bayshore Boulevard that could be implemented that would reduce auto delay at signalized intersections without degrading transit travel times. However, those improvements would not be enough to improve intersection operating conditions to acceptable levels of LOS D or better.

To accommodate additional right-of-way needed for additional lanes, Bayshore Boulevard would need to be widened to the east and the west. This would require demolition of existing structures and substantial right-of-way acquisition. Widening Bayshore Boulevard at this location would be inconsistent with the pedestrian environment created by the Third Street Light Rail Project. Widening of Bayshore Boulevard would make the pedestrian crossing of Bayshore Boulevard longer, and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Because the mitigation measure would worsen the pedestrian conditions and due to the right-of-way constraints, the measure was not further considered.

Previous studies have suggested restriping the westbound approach on Blanken Avenue to provide a dedicated right-turn lane and a dedicated left-turn lane approaching Bayshore Boulevard. However, SFMTA has indicated that this would not be advisable given the existing curve on Blanken Avenue. Therefore, this mitigation measure was not further considered. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

42. San Bruno/Paul - At the signalized intersection of San Bruno/Paul, the degradation in level of service would primarily due to forecasted substantial traffic volume increases on all approaches. Paul Avenue is one of a relatively few number of streets in the area that connects between the east and west side of U.S. 101. As a result, east-west travel in the area is concentrated to the few streets that provide connections across the freeway, including Paul Avenue.

Widening Paul Avenue at this intersection would create the need for major right-of-way acquisition and likely require reconstruction of the U.S. 101 overpass to accommodate a wider Paul Avenue cross section. Widening San Bruno Avenue would require roadway widening and major right-of-way acquisition, which would displace a large number of existing homes and businesses. Mitigation measures that would widen Paul Avenue or San Bruno Avenue at this intersection were not further considered. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

43. San Bruno/Silver - At the signalized intersection of San Bruno/Silver, the degradation in level of service would primarily be due to forecasted substantial traffic volume increases on all approaches. Silver Avenue is one of a relatively few number of streets in the area that connects between the east and west side of U.S. 101. As a result, east-west travel in the area is concentrated to the few streets that provide connections across the freeway, including Silver Avenue.

Widening Silver Avenue at this intersection would create the need for major right-of-way acquisition and likely require reconstruction of the existing bridge structure across U.S. 101 to accommodate a wider Silver Avenue cross section. Widening San Bruno Avenue would require roadway widening and major right-of-way acquisition, which would displace a large number of existing homes and businesses. Mitigation measures that would widen Silver Avenue or San Bruno Avenue at this intersection were not further considered. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

44. San Bruno/Mansell/U.S. 101 Southbound Off-ramp - At the all-way STOP sign controlled intersection of San Bruno/Mansell/U.S. 101 Southbound off-ramp, the degradation in level of service would primarily be due to forecasted substantial traffic volume increases on all approaches to the intersection. A new traffic signal at the intersection of San Bruno/Mansell/U.S. 101 Southbound off-ramp would increase the intersection's capacity. To ensure that queues from traffic using the off-ramp do not exceed 700 feet, which would extend onto the freeway mainline, the signal should be operated on a relatively short cycle length. However, due to the 50-foot wide median between eastbound and westbound Mansell Street, west of San Bruno Avenue, a new traffic signal would likely have to operate in a less-efficient "split phase" operation, such that westbound and eastbound movements could not happen simultaneously. Under this scenario, the intersection would improve to LOS E under 2030 No Project conditions, and queues on the off-ramp may occasionally extend to the freeway mainline during peak hours. Therefore, this improvement was deemed infeasible and was not considered further. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

58. Evans/Napoleon/Toland – At the signalized intersection of Evans/Napoleon/Toland, additional capacity would be required on Evans Street and Napoleon Street to achieve acceptable intersection LOS. Although the lanes on these streets are relatively wide, and additional lanes could possibly be striped within the existing right-of-way, particularly on Napoleon and Toland Streets, the resulting lane widths would not likely be appropriate for the relatively high portion of truck and industrial traffic in the area. Therefore, lane restriping at this intersection was not considered further as a mitigation measure.

Widening any of the approaches to this intersection would require right-of-way acquisition, and would require demolition of existing structures. This would require substantial amount of money and would result in the displacement of numerous businesses. Therefore, roadway widening at this intersection was not considered further as a mitigation measure. Project-related traffic impacts at this intersection would remain *significant and unavoidable*.

Less than Significant Traffic Impacts

Project-contributions to LOS E and LOS F operating conditions were determined to be less than significant at the following nine study intersections.

16. Cesar/Evans
19. Bayshore/Hester/U.S. 101 southbound off-ramp
20. Bayshore/Tunnel
22. Bayshore/Arleta
23. Bayshore/Leland
40. Bayshore/Silver
45. San Bruno/Silliman/U.S. 101 southbound ramps
52. Bayshore/Old County Road
53. Sierra Point/Lagoon Way

The degradation in level of service would primarily be due to forecasted traffic increases along Bayshore Boulevard, Cesar Chavez Street, Evans Avenue, and San Bruno Avenue. At the study intersections within San Bruno (i.e., Bayshore/Old County and Sierra Point/Lagoon) the primary cause of increased congestion development assumed to occur at the adjacent Brisbane Baylands site. Since the Project would not contribute significantly to the poor operating conditions at these nine intersections, Project-related impacts at these intersections would be *less than significant.*

Harney Way Widening – As part of the Project, the existing four-lane Harney Way would be widened to the north and south of its existing alignment, and would be rebuilt to contain between two and three travel lanes in each direction, turn pockets, two BRT-only lanes, Class I and Class II bicycle facilities, new sidewalks, as well as a landscaped area. Initially, the roadway would be rebuilt as a new five-lane roadway (with right-of-way reserved for additional lane(s) to be built in the future as needed for increased traffic levels). There would be two lanes in each direction, with eastbound left-turn lanes at Thomas Mellon Circle and Executive Park Boulevard East and a westbound right-turn lane at the Executive Park Boulevard East intersection. A Class II bicycle lane would be provided on the north side of the roadway, and a Class I bicycle path would be provided on the south side of the roadway. Two exclusive BRT lanes would be constructed adjacent to the roadway on its north side. After 49ers games at the new stadium, left turns would be prohibited at the two Harney Way intersections with Thomas Mellon Drive and Executive Park Boulevard for a period to allow for the configuration of the roadway to change to four westbound auto lanes and one eastbound auto lane. Under the final configuration, a portion of the landscaped area installed as part of the initial widening would be rebuilt to provide additional lane(s) from the proposed Harney Interchange east to Arelious Walker Drive, if necessary.

The initial phase of Harney Way widening would provide for additional landscaping area (i.e., in the area that would be converted to future travel lane(s)), which would make the pedestrian crossing of Harney Way shorter than with the final configuration. Under both the initial and final configurations, pedestrian crosswalks would be provided at the signalized intersections of Harney Way with Jamestown Avenue, Executive Park East and Thomas Mellon Drive, and pedestrian crossing times would be provided consistent with the requirements of the California Manual of Uniform Traffic Control Devices (MUTCD).

Since the need for the final lane configuration on Harney Way would depend on the rate of buildout of the Project, as well as the rate and extent of buildout of cumulative development in the area such as the Executive Park development, further studies would be needed to determine if and when additional travel lanes are needed to accommodate the traffic volume demand.

> ***Project Mitigation Measure 6:*** Prior to issuance of the grading permit for Phase 2 of the Project, the Project Applicant shall widen Harney Way as shown in **Figure 5** in the Transportation Study. Prior to the issuance of grading permits for Phases 2, 3 and 4, the Project Applicant shall fund a study to evaluate traffic conditions on Harney Way and determine whether additional traffic associated with the next phase of development would result in the need to modify Harney Way to its ultimate configuration, as shown in **Figure 6,** unless this ultimate configuration has already been built. This study shall be conducted in collaboration with the SFMTA, which would be responsible for making final determinations regarding the ultimate configuration. The ultimate configuration would be linked to intersection performance, and it would be required when study results indicate intersection LOS at one or more of the three signalized intersection on Harney Way at mid-LOS D (i.e., at an average delay per vehicle of more than 45 seconds per vehicle). If the study and SFMTA conclude that reconfiguration would be necessary to accommodate traffic demands associated with the next phase of development, the Project Applicant shall be responsible to fund and complete construction of the improvements prior to occupancy of the next phase.

With implementation of the Project Mitigation Measure 6, Harney Way would be widened and improved to its final configuration when traffic demand warrants additional capacity. Therefore, potential Project impacts and Project contribution to cumulative impacts on traffic capacity on Harney Way would be reduced to *less than significant*.

Traffic Spillover - As described above, the Project would result in traffic volumes on area roadways, and most substantially on key north/south and east/west streets, which would also experience cumulative traffic growth. A concern in the Bayview Hunters Point neighborhood is the likelihood that existing residential streets would be "cut-throughs," shortcuts, or bypasses used by non-neighborhood traffic. Substantial amounts of cut-through traffic can result in impacts such as noise, safety impacts to pedestrians, impaired driveway access, interference with emergency vehicle access, increased dust, exhaust, and litter, and similar annoyances that adversely affect neighborhood character.

Within the Candlestick Point area, the Project would include new arterials connecting the Project site to Harney Way and U.S. 101, as well as improvements to existing roadways such as Carroll Avenue, Gilman Avenue, and Jamestown Avenue. These improvements and new roadways would encourage residents and visitors to the Project to use the major arterials for access to and from the site, and would minimize the likelihood of cut-through traffic using residential streets in Bayview Hunters Point. Many of the residential streets in the neighborhood do not cross Third Street to connect with Bayshore Boulevard, and therefore are not attractive bypass routes. In addition, left turns from Third Street are permitted at limited locations, with Carroll Avenue, Gilman Avenue and Jamestown Avenue anticipated to serve as the key east/west routes for Project traffic.

SFMTA has recently completed the *Bayview Traffic Calming Project*[18] which was a community-based process to identify problem locations with a study area roughly bounded by Jamestown Avenue, Third Street and Evans Avenue, and traffic calming measures. The study resulted in a list of traffic calming measures (such as gateway islands, speed humps, speed cushions, and traffic circles) along specific roadways. Implementation of improvements will be phased, and most cost-efficient solutions will be implemented first. Implementation of SFMTA's traffic calming recommendations for the Bayview (e.g., gateway islands, speed humps, speed cushions, and traffic circles) would further discourage cut-through traffic. However, given that many intersections at or near the Project site would be congested, it is likely that spillover impacts would still occur.

The TDM Plan included as part of Project Mitigation Measure 1 would require annual monitoring of traffic conditions to review the effectiveness of the Project's transportation measures and other traffic calming measures implemented in the area to reduce congestion due to

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[18] *Bayview Traffic Calming Project* report, SFMTA, December 2006.

Project vehicle trips and to minimize traffic spillover to neighboring residential streets. If warranted, the On-Site TDM Coordinator and SFMTA would consider implementation of additional traffic-calming and congestion-alleviating measures, such as adding additional lanes to the streets that approach Third Street, or other congested areas.

Implementation of the TDM Plan and the transit improvements would likely reduce spillover impacts. Nonetheless, cut-through traffic may occur during periods of congestion, and the impacts associated with spillover traffic would remain *significant and unavoidable.*

Project Variants

Project Variants 1 and 2 would be similar to the Project, except that instead of a new football stadium, which generates very few weekday peak hour vehicle trips, there would be additional research and development space under Variant 1, or a shift in residential units from Candlestick Point to Hunters Point Shipyard under Variant 2. The additional research and development space envisioned under Variant 1 would generate more weekday peak hour vehicular traffic than the Project. **Tables 29** and **30** in Chapter 4 present the peak hour vehicle trips for the Project Variants 1 and 2.

Since the final TDM Plan has not been formally approved yet, ***Project Variant 1 Mitigation Measure 1*** and ***Project Variant 2 Mitigation Measure 1*** would be to implement Project Mitigation Measure 1.

To ensure that Harney Way is widened and improved to its final configuration when traffic demand warrants additional capacity, ***Project Variant 1 Mitigation Measure 2*** and ***Project Variant 2 Mitigation Measure 2*** would be to implement Project Mitigation Measure 6.

Project Variant 1

Under Project Variant 1 conditions, 44 of the 60 study intersections would operate at LOS E or LOS F conditions during the weekday AM or PM, or Sunday PM peak hours. At 14 of the 44 intersections the Project would result in project-specific impacts (i.e., project trips would cause intersections expected to operate at LOS D or better under 2030 No Project conditions to operate at LOS E or F, or intersections operating at LOS E under 2030 No Project conditions to deteriorate to LOS F conditions). At the remaining 30 of the 44 intersections that would operate at LOS E or LOS F, Project Variant 1 contributions were determined to be less than significant at 8 intersections, and significant at 22 intersections (as identified in **Table 48**). Development associated with Project Variant 1 would therefore result in impacts at 36 intersections (14 Project-specific and 22 with significant contributions to LOS E or LOS F conditions).

Mitigation measures have been identified for the following seven intersections:

26. Tunnel/Blanken
27. Geneva/U.S. 101 Southbound Ramps (existing Alana/Beatty)
28. Harney/U.S. 101 Northbound Ramps (existing Alana/Harney/Thomas Mellon)
30. Crisp/Palou/Griffith
35. Amador/Cargo
37. Bayshore/Oakdale
49. Bayshore/Geneva

26. Tunnel/Blanken – At the signalized intersection of Tunnel/Blanken (currently unsignalized and required to be signalized as part of the Visitacion Valley Redevelopment), the intersection operating conditions would worsen in the AM peak hour from LOS D under 2030 No Project conditions to LOS F with Project Variant 1. In the PM peak hour, the intersection would operate at LOS F under 2030 No Project and with the Project Variant 1 conditions.

> ***Project Variant 1 Mitigation Measure 3***: Implement Project Mitigation Measure 2 to reconfigure the northbound and southbound approaches to the intersection of Tunnel/Blanken to provide left turn lanes adjacent to shared through/right lanes. With implementation of Project Mitigation Measure 2, operations at this intersection would improve, but not to acceptable LOS D or better conditions in the AM and PM peak hours. Therefore, project-related impacts at this intersection would remain *significant and unavoidable*.

27. Geneva/U.S. 101 Southbound Ramps (existing Alana/Beatty)
28. Harney/U.S. 101 Northbound Ramps (existing Alana/Harney/Thomas Mellon)
Project Variant 1 would contribute significantly to cumulative impacts at these intersections.

> ***Project Variant 1 Mitigation Measure 4***: Implement Project Mitigation Measure 3. The SFCTA shall coordinate with the City of Brisbane and Caltrans to ensure that Project-generated vehicle trips are accounted for the Harney Interchange analyses and design. Since implementation of Project Mitigation Measure 5 would be under the jurisdiction of the City of Brisbane, the implementation of the mitigation measure is uncertain. Therefore, the Variant 1-related impacts at these intersections would remain *significant and unavoidable.*

30. Crisp/Palou/Griffith – The intersection of Crisp/Palou is currently unsignalized, but would be signalized with implementation of Project Variant 1. With Project Variant 1, the intersection of Crisp/Palou would worsen in the AM and PM peak hours from LOS E under 2030 No Project conditions to LOS F with Project Variant 1.

> ***Project Variant 1 Mitigation Measure 5***: Restripe the southbound approach to provide a dedicated left-turn lane and a shared through/right-turn lane. On-street parking would be prohibited on Griffith Street between Palou Avenue and Oakdale Avenue.

Implementation of this improvement would be the responsibility of SFMTA and DPW, and shall be implemented as part of Hunters Point Shipyard Phase 3 roadway network improvements. The Project Applicant, in collaboration with the City, shall monitor traffic conditions at completion of Phase 2, Phase 3 and Phase 4 to determine whether the intersection operations would warrant reconfiguration and when it should be implemented. Based on the monitoring, if the City determines reconfiguration is warranted, the Project Applicant shall be required to fund the cost of reconfiguration. The SFMTA and DPW shall design and implement the measure as necessary. With implementation of Project Variant 1 Mitigation Measure 4, this intersection would operate at acceptable LOS D or better in the AM and PM peak hours, and therefore with its implementation, project-related impacts at this intersection would be *less than significant*.

35. Amador/Cargo/Illinois – Project Variant 1 would contribute significantly to cumulative impacts at this intersection.

Project Variant 1 Mitigation Measure 6**:** Implement Project Mitigation Measure 4. SFMTA shall conduct a feasibility study of the intersection with the Port of San Francisco to determine the feasibility of reconfiguring the southbound approach on Illinois Street to provide a dedicated left turn lane and a dedicated right turn lane. With implementation of Project Mitigation Measure 4**,** operations at this intersection would improve to acceptable levels. However, since a feasibility study would be required, implementation of Mitigation Measure 4 is uncertain, and therefore, Variant 1-related impacts at this intersection would remain *significant and unavoidable.*

47. Innes/Earl - At the unsignalized intersection of Innes/Earl, operating conditions would worsen in the PM peak hour from LOS C under 2030 No Project conditions to LOS E with Project Variant 1, and traffic signal warrants would be met. The intersection is proposed as a side street STOP sign controlled intersection, with movements along Innes Avenue uncontrolled and movements on southbound Earl Street controlled by a STOP sign. The degradation in level of service is primarily due to large increases in traffic along Innes Avenue. The high traffic volumes on Innes Avenue cause additional delay for traffic attempting to exit Earl Street, which is assumed to provide a single lane to accommodate both southbound right-turns and southbound left-turns onto Innes. Project Variant 1 would result in higher volumes of traffic along Innes Avenue than the Project, therefore creating higher delays for southbound traffic on Earl Street.

Project Variant 1 Mitigation Measure 7: Install a traffic signal at the intersection of Innes/Earl. Installation of a traffic signal at the intersection of Innes/Earl would improve intersection operations to LOS D or better conditions. Traffic forecasts show that this intersection would be very close to meeting peak hour traffic signal warrants with buildout of the Project Variant 1. The Project Applicant, in collaboration with the City, shall monitor traffic volumes at completion of Phase 2, Phase 3 and Phase 4 to determine whether the intersection volumes would actually warrant a traffic signal and when it should be implemented. Based on the monitoring, if the City determines a traffic signal is warranted, the Project Applicant shall be required to fund installation of a traffic signal as part of later development phases. The SFMTA and DPW shall design and implement the measure as necessary. Implementation of Variant 1 Mitigation Measure 6 would reduce the impacts at this intersection to *less than significant* levels.

49. Bayshore/Geneva – Project Variant 1 would contribute significantly to cumulative impacts at this location.

***Project Variant 1 Mitigation Measure 8*:** Implement Project Mitigation Measure 5. The SFMTA and SFCTA shall coordinate with the City of Brisbane to ensure that projected traffic volumes are accounted for in the design of the Geneva Avenue Extension. Since implementation of Project Mitigation Measure 5 would be under the jurisdiction of the City of Brisbane, the implementation of the mitigation measure is uncertain. Therefore, the Variant 1-related impacts at this intersection would remain *significant and unavoidable.*

The Project impact discussion above did not identify any feasible mitigation measures for 25 of the 36 intersections that would be impacted by Project Variant 1, which include the following:

1. Third/25th
2. Third/Cesar Chavez
3. Third/Cargo
4. Third/Evans
5. Third/Oakdale
6. Third/Palou
7. Third/Revere
8. Third/Carroll
9. Third/Paul
11. Third/Jamestown
15. Cesar/Pennsylvania/I-280
18. Bayshore/Paul
21. Bayshore/Bacon
24. Bayshore/Visitacion
25. Bayshore/Sunnydale
36. Bayshore/Cortland
38. Bayshore/Alemany/Industrial
39. Bayshore/U.S. 101 northbound off to Cesar
41. Bayshore/Blanken
42. San Bruno/Paul
43. San Bruno/Silver
44. San Bruno/Mansell/U.S. 101 Southbound Off-ramp

56. Third/Williams/Van Dyke
57. Third/Jerrold
58. Third/Napoleon/Toland

At these 25 intersections feasible mitigation measures have not been identified, and therefore Variant 1 impacts at these locations would remain *significant and unavoidable.*

Discussion is provided for four intersections not previously discussed under Project condition where mitigation measures have not been identified. The four intersections include:

15. Cesar/Evans
32. Ingalls/Carroll
37. Bayshore/Oakdale
48. Evans/Jennings

15. Cesar/Evans – Project Variant 1 would contribute significantly to cumulative impacts at the signalized intersection of Cesar/Evans. As indicated in the 2030 No Project discussion, feasible mitigation measures that do not involve reconstruction of the existing viaduct have not been identified. Project Variant 1 impacts would remain significant and unavoidable.

32. Ingalls/Carroll – The intersection of Ingalls/Carroll is currently unsignalized, but would be signalized with implementation of Project Variant 1. The intersection of Ingalls/Carroll would worsen in the PM peak hour from LOS C under year 2030 No Project conditions to LOS E with Project Variant 1. The degradation in level of service at this intersection would primarily be due to heavy increases in traffic on Ingalls Street, particularly in the southbound direction in the PM peak hour. Ingalls Street would serve as the most direct auto traffic route for traffic from the Hunters Point Shipyard site destined for Candlestick Point and US 101. Therefore, it would experience substantial traffic increases as part of the Project Variant 1.

To accommodate additional right-of-way needed for additional lanes on southbound Ingalls, Ingalls Street would need to be widened to the east and west. This would require prohibition of on-street parking, which is vital to the industrial businesses along this section of Ingalls Street that use street parking for loading and unloading, or substantial narrowing of the sidewalks. Narrowing of sidewalks would create longer pedestrian crossing distances, and would require more pedestrian crossing time as part of a signal phasing plan. Because widening Ingalls Street would worsen pedestrian conditions, this mitigation was not considered further.

Alternatively, a mitigation measure that reduced travel demand on Ingalls Street by providing an alternate route, such as the Yosemite Slough bridge, would improve operations at this intersection. The proposed new bridge across Yosemite Slough would accommodate four lanes of traffic on game days only plus two transit-only lanes, open at all times, under the Project scenario. Under Project Variant 1, the bridge would only provide the two transit-only lanes, and a bicycle/pedestrian path. If this bridge were to be constructed to the full width as proposed by the Project and if traffic were allowed to use it at all times (two lanes each direction), it would reduce traffic impacts at this intersection. However, allowing traffic on the Yosemite Slough bridge at all times would have potential secondary impacts to Yosemite Slough associated with noise, air quality, and visual impacts, and would be inconsistent with the overall character of the Yosemite Slough restoration. Therefore, opening the Yosemite Slough bridge to regular traffic was not considered further.

Since widening Ingalls Street would not be feasible and providing an alternate traffic route via the Yosemite Slough bridge may have secondary impacts, project-related impacts at this intersection would remain *significant and unavoidable*.

37. Bayshore/Oakdale – At the signalized intersection of Bayshore/Oakdale, the intersection operating conditions would worsen in the PM peak hour from LOS C under 2030 No Project conditions to LOS E with Project Variant 1. The degradation in level of service would primarily be due to forecasted substantial traffic volume increases on Bayshore Boulevard. Mitigation for this impact would involve increasing capacity on Bayshore Boulevard. There is not adequate right-of-way to provide additional lanes on Bayshore Boulevard without widening the roadway. Roadway widening would require major right-of-way acquisition along the entire Bayshore Boulevard corridor, at great cost and displacement of existing homes and businesses. Traffic impacts at this intersection under conditions with the Project Variant 1 would remain *significant and unavoidable*.

48. Evans/Jennings - The unsignalized intersection of Evans/Jennings would operate at LOS F in the AM and PM peak hours under 2030 No Project conditions. With the Project Variant 1, the intersection would be signalized and restriped to accommodate the future travel patterns. With Project Variant 1, the intersection would operate at LOS E in the AM peak hour, and Project Variant 1 would contribute significantly to the poor operating conditions. Additional capacity would be required in the eastbound and southbound directions to accommodate the additional vehicles generated by Project Variant 1. Additional lanes would require substantial right-of-way acquisition to the north or south of Evans Avenue, and on Jennings Street. Right-of-way acquisition would not be possible, and therefore, project-related impacts at Evans/Jennings would remain *significant and unavoidable*.

Project Variant 2

Under Project Variant 2 conditions, 40 of the 60 study intersections would operate at LOS E or LOS F conditions during the weekday AM or PM, or Sunday PM peak hours. At 11 of the 40 intersections the Project Variant 2 would result in project-specific impacts (i.e., project trips would cause intersections expected to operate at LOS D or better under 2030 No Project conditions to operate at LOS E or F, or intersections operating at LOS E under 2030 No Project conditions to deteriorate to LOS F conditions). At the remaining 29 of the 40 intersections that would operate at LOS E or LOS F, Project Variant 2 contributions were determined to be less than significant at 8 intersections, and significant at 21 intersections (as identified in Table 48). Development associated with Project Variant 2 would therefore result in impacts at 32 intersections (11 project-specific and 21 with significant contributions to LOS E or LOS F conditions).

Mitigation measures were identified for the following five intersections:

26. Tunnel/Blanken
27. Geneva/U.S. 101 Southbound Ramps (Alana/Beatty)
28. Harney/U.S. 101 Northbound Ramps (Alana/Harney/Thomas Mellon)
35. Amador/Cargo
49. Bayshore//Geneva

26. Tunnel/Blanken – At the signalized intersection of Tunnel/Blanken (currently unsignalized and required to be signalized as part of the Visitacion Valley Redevelopment), the intersection operating conditions would worsen in the AM peak hour from LOS D under 2030 No Project conditions to LOS F with Project Variant 2. In the PM peak hour, the intersection would operate at LOS F under 2030 No Project and Project Variant 2 conditions.

> ***Project Variant 2 Mitigation Measure 3*:** Implement Project Mitigation Measure 2 to reconfigure the northbound and southbound approaches to the intersection of Tunnel/Blanken to provide left turn lanes adjacent to shared through/right lanes. With implementation of Project Mitigation Measure 2, operations at this intersection would improve, but not to acceptable LOS D or better conditions in the AM and PM peak hours. Therefore, project-related impacts at this intersection would remain *significant and unavoidable*.

27. Geneva/U.S. 101 Southbound Ramps (existing Alana/Beatty)
28. Harney/U.S. 101 Northbound Ramps (existing Alana/Harney/Thomas Mellon)
Project Variant 2 would contribute significantly to cumulative impacts at these intersections.

> ***Project Variant 2 Mitigation Measure 4*:** Implement Project Mitigation Measure 3. The SFCTA shall coordinate with the City of Brisbane and Caltrans to ensure that Project-generated vehicle trips are accounted for the Harney Interchange analyses and design. Since implementation of Project Mitigation Measure 5 would be under the jurisdiction of the City of Brisbane, the implementation of the mitigation measure is uncertain. Therefore, the Variant 1-related impacts at these intersections would remain *significant and unavoidable.*

35. Amador/Cargo/Illinois – Project Variant 2 would contribute significantly to cumulative impacts at this intersection.

***Project Variant 2 Mitigation Measure 5*:** Implement Project Mitigation Measure 4. SFMTA shall conduct a feasibility study of the intersection with the Port of San Francisco to determine the feasibility of reconfiguring the southbound approach on Illinois Street to provide a dedicated left turn lane and a dedicated right turn lane. With implementation of Project Mitigation Measure 4**,** operations at this intersection would improve to acceptable levels. However, since a feasibility study would be required, implementation of Mitigation Measure 4 is uncertain, and therefore, Variant 2-related impacts at this intersection would remain *significant and unavoidable.*

49. Bayshore/Geneva – Project Variant 2 would contribute significantly to cumulative impacts at this location.

***Project Variant 2 Mitigation Measure 6*:** Implement Project Mitigation Measure 5. The SFMTA and SFCTA shall coordinate with the City of Brisbane to ensure that projected traffic volumes are accounted for in the design of the Geneva Avenue Extension. Since implementation of Project Mitigation Measure 5 would be under the jurisdiction of the City of Brisbane, the implementation of the mitigation measure is uncertain. Therefore, the Project Variant 2-related impacts at this intersection would remain *significant and unavoidable.*

The Project and Project Variant 1 discussions did not identify any feasible mitigation measures for 27 of the 32 intersections that would be impacted by Project Variant 2, which include the following:

1. Third/25th
2. Third/Cesar Chavez
3. Third/Cargo
4. Third/Evans
5. Third/Oakdale
6. Third/Palou
7. Third/Revere
8. Third/Carroll
9. Third/Paul
11. Third/Jamestown
15. Cesar/Pennsylvania/I-280
16. Cesar/Evans
18. Bayshore/Paul
21. Bayshore/Bacon
24. Bayshore/Visitacion
25. Bayshore/Sunnydale
36. Bayshore/Cortland

37. Bayshore/Oakdale
38. Bayshore/Alemany/Industrial
39. Bayshore/U.S. 101 northbound off to Cesar
41. Bayshore/Blanken
42. San Bruno/Paul
43. San Bruno/Silver
44. San Bruno/Mansell/U.S. 101 Southbound Off-ramp
56. Third/Williams/Van Dyke
57. Third/Jerrold
58. Evans/Napoleon/Toland

At the 27 intersections where feasible mitigation measures have not been identified, Variant 2 impacts would remain *significant and unavoidable.*

Freeway Operations

Tables 49 through 51 present the results of the freeway mainline and weaving section analysis for conditions with the Project conditions for the AM and PM, and Sunday peak hours, respectively. **Table 52** presents a summary table of project impacts for Project, Project Variants, and Alternatives to the Project for the freeway mainline segments.

Tables 53 through 55 present the results of the freeway mainline and weaving section analysis for conditions with the Project conditions for the AM and PM, and Sunday peak hours, respectively. **Table 56** presents a summary table of project impacts for Project, Project Variants, and Alternatives to the Project for the ramp analysis locations. **Tables 57 through 59** present the results of the freeway diverge (off-ramp) queue storage analysis for conditions with the Project.

Mainline and Weaving Segments

The Project would not cause any freeway mainline segment to deteriorate from acceptable LOS D or better to LOS E or F conditions, nor would it cause any segment to deteriorate from LOS E to LOS F. However, the Project would contribute cumulatively considerable amounts of traffic to five freeway segments expected to operate at LOS E or F under 2030 No Project conditions:

- U.S. 101 northbound from Sierra Point to Alana/Geneva/Harney (AM and PM)
- U.S. 101 southbound from the I-80 Merge to Cesar Chavez (AM and PM)

Table 49
Mainline and Weaving Segment LOS
Project and Project Variant Conditions - Weekday AM Peak Hour

Mainline Segment	Existing		No Project (Alt 1)		Project		Project-Var. 1 (R&D)		Project-Var. 2 (Housing)	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101										
NB - Cesar Chavez to Vermont	**E**	**44.6**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB – Harney Way to Third/Bayshore	D	33.8	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB – Sierra Point to Harney Way	D	33.8	**E**	**40.5**	**E**	**44.0**	**F**	**>45**	**E**	**43.9**
SB – I-80 Merge to Cesar Chavez	D	33.4	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – Third/Bayshore to Harney Way	**E**	**43.0**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – Harney/Geneva to Sierra Point	**E**	**42.2**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
I-280										
NB – Alemany Off to Alemany On	**E**	**39.1**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**>45**
SB – Alemany On to Alemany Off	C	23.9	D	34.6	D	34.6	D	34.6	D	34.6
Weaving Segment	**LOS**	**Service Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**
I-280										
NB – 25th Street to Mariposa Street	**E**	**1,680**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**
SB – Mariposa Street to 25th Street	B	810	**E**	**1,710**	**E**	**1,710**	**E**	**1,710**	**E**	**1,710**

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. For weaving sections service volume is reported as the measure of effectiveness. pc/h = passenger cars per hour
3. Segments operating at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

Table 50
Mainline and Weaving Segment LOS
Project and Project Variant Conditions - Weekday PM Peak Hour

Mainline Segment	Existing		No Project (Alt 1)		Project		Project-Var. 1 (R&D)		Project-Var. 2 (Housing)	
	LOS [1]	Density [2] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101										
NB - Cesar Chavez to Vermont	D	26.8	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB – Harney Way to Third/Bayshore	**E**	**42.3**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB – Sierra Point to Harney Way	**E**	**42.9**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – I-80 Merge to Cesar Chavez	D	33.8	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – Third/Bayshore to Harney Way	**E**	**36.0**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – Harney/Geneva to Sierra Point	**E**	**36.8**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
I-280										
NB – Alemany Off to Alemany On	C	23.9	D	33.3	D	33.3	D	33.3	D	33.3
SB – Alemany On to Alemany Off	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
Weaving Segment	**LOS**	**Service [3] Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**
I-280										
NB – 25th Street to Mariposa Street	C	1,350	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**
SB – Mariposa Street to 25th Street	**E**	**1,630**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**

Notes:
1. Segments operating at LOS E or LOS F conditions highlighted in **bold**
2. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
3. For weaving sections service volume is reported as the measure of effectiveness. pc/h = passenger cars per hour
Source: Fehr and Peers.

Table 51
Mainline and Weaving Segment LOS
Project and Project Variant Conditions - Sunday PM Peak Hour

Mainline Segment	Existing		No Project (Alt 1)		Project		Project-Var. 1 (R&D)		Project-Var. 2 (Housing)	
	LOS [1]	Density [2] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101										
NB - Cesar Chavez to Vermont	C	20.6	D	32.3	D	33.7	D	33.7	D	34.0
NB – Harney Way to Third/Bayshore	C	22.0	D	30.4	D	32.3	D	32.3	D	32.4
NB – Sierra Point to Harney Way	C	21.9	D	27.3	D	31.4	D	31.0	D	31.0
SB – I-80 Merge to Cesar Chavez	D	28.8	D	33.3	D	34.1	D	34.0	D	34.0
SB – Third/Bayshore to Harney Way	C	21.4	D	32.0	D	34.3	D	34.5	D	34.4
SB – Harney/Geneva to Sierra Point	C	21.2	C	24.9	D	28.6	D	28.6	D	28.4
I-280										
NB – Alemany Off to Alemany On	B	15.6	C	21.6	C	21.6	C	21.6	C	21.6
SB – Alemany On to Alemany Off	D	27.0	D	29.5	D	29.5	D	29.5	D	29.5
Weaving Segment	**LOS**	**Service [3, 4] Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**	**LOS**	**Service Vol. (pc/l)**
I-280										
NB – 25th Street to Mariposa Street	A	-	C	1,200	C	1,220	C	1,250	C	1,230
SB – Mariposa Street to 25th Street	A	-	C	1,310	C	1,300	C	1,340	C	1,320

Notes:
1. Segments operating at LOS E or LOS F conditions highlighted in **bold**
2. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
3. For weaving sections service volume is reported as the measure of effectiveness. pc/h = passenger cars per hour
4. Weaving segments with speeds greater than 50 mph are outside of the realm of the weaving analysis, and thus are assumed to operate at LOS A.
Source: Fehr and Peers.

Table 52
Summary of Impacts at Mainline and Weaving Segments Operating at LOS E or LOS F

Mainline Segment	Project	P-Var 1 (R&D)	P-Var 2 (Housing)	Alt 1 No Project	Alt 2 No Bridge	Alt 3 49ers at Stick	Alt 4 Lesser Build	Alt 5 No Park Agree
U.S. 101								
NB - Cesar Chavez to Vermont	NSC	**SC/PI**	NSC	**NP Impact**	NSC	NSC	NSC	NSC
NB – Harney Way to Third/Bayshore	NSC	NSC	NSC	**NP Impact**	NSC	NSC	NSC	NSC
NB –Sierra Point to Harney Way	**SC/PI**	**SC/PI**	**PI**	**NP Impact**	**SC/PI**	NSC	**SC/PI**	**PI**
SB – I-80 Merge to Cesar Chavez	**SC/PI**	**SC/PI**	NSC	**NP Impact**	**SC/PI**	NSC	NSC	NSC
SB – Third/Bayshore to Harney Way	**SC/PI**	**SC/PI**	**SC/PI**	**NP Impact**	**SC/PI**	NSC	**SC/PI**	**SC/PI**
SB – Harney/Geneva to Sierra Point	**SC/PI**	**SC/PI**	**SC/PI**	**NP Impact**	**SC/PI**	**SC/PI**	**SC/PI**	**SC/PI**
I-280								
NB – Alemany Off to Alemany On	NSC	NSC	NSC	**NP Impact**	NSC	NSC	NSC	NSC
SB – Alemany On to Alemany Off	NSC	NSC	NSC	**NP Impact**	NSC	NSC	NSC	NSC
NB – 25th Street to Mariposa Street	NSC	NSC	NSC	**NP Impact**	NSC	NSC	NSC	NSC
SB – Mariposa Street to 25th Street	NSC	NSC	NSC	**NP Impact**	NSC	NSC	NSC	NSC

Notes:
1. PI – Project Impact. Project results in a change in mainline segments from LOS D or better under 2030 No Project conditions, to LOS E or LOS F with the Project, Project Variants, or Project Alternatives.
2. NSC – No Significant Contribution. Project would not contribute significantly to mainline segments operating at LOS E or LOS F under 2030 No Project conditions. No impacts.
3. SC/PI – Significant Contribution/Project Impact. Project would contribute significantly to mainline segment operating at LOS E or LOS F under 2030 No Project conditions, resulting in a Project Impact.

Table 53
Ramp Junction LOS
Project and Project Variants Conditions - Weekday AM Peak Hour

Ramp Location	Existing		2030 No Project		Project		Project-Var. 1 (R&D)		Project-Var. 2 (Housing)	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101										
NB on from Sierra Point Parkway	C	27.0	C	27.5	D	30.4	D	31.8	D	30.3
NB on from Harney Way[2]	C	20.2	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Bayshore	D	31.2	C	22.5	C	23.6	C	24.4	C	23.5
NB on from Alemany/Industrial	**E**	**36.4**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Bayshore/Cesar	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB off to Bayshore/Cesar Chavez	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Cesar Chavez/Potrero	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Alemany/San Bruno	C	24.1	D	28.8	C	24.1	C	24.5	C	24.1
SB on from Third/Bayshore	D	30.0	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Harney/Geneva[2]	D	29.7	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Sierra Point/Lagoon	C	27.7	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
I-280										
NB off to Cesar Chavez	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Indiana/25th	D	33.4	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB off to Pennsylvania/25th	C	23.6	**E**	**37.0**	**E**	**36.9**	**E**	**37.5**	**E**	**36.9**
SB on from Pennsylvania/25th	C	22.9	**E**	**36.3**	**E**	**36.1**	**E**	**36.3**	**E**	**36.3**

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. Cumulative 2030 No Project conditions assume the reconstruction of the Harney Way interchange, as well as the extension of Geneva Avenue from Bayshore Boulevard east to the reconstructed interchange.
3. Ramp junctions at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

Table 54
Ramp Junction LOS
Project and Project Variants Conditions - Weekday PM Peak Hour

Ramp Location	Existing		2030 No Project		Project		Project-Var. 1 (R&D)		Project-Var. 2 (Housing)	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101										
NB on from Sierra Point Parkway	D	29.7	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Harney Way[2]	D	30.0	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Bayshore	D	28.6	D	27.9	D	30.0	D	30.0	D	30.0
NB on from Alemany/Industrial	D	30.2	**E**	**35.9**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Bayshore/Cesar	B	19.6	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB off to Bayshore/Cesar Chavez	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Cesar Chavez/Potrero	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Alemany/San Bruno	C	24.5	D	29.6	D	32.6	D	32.7	D	32.7
SB on from Third/Bayshore	C	26.5	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Harney/Geneva[2]	C	24.2	D	31.9	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Sierra Point/Lagoon	C	26.5	C	22.7	D	28.5	D	30.0	D	28.5
I-280										
NB off to Cesar Chavez	D	28.4	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Indiana/25th	C	27.4	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB off to Pennsylvania/25th	**E**	**36.7**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Pennsylvania/25th	**E**	**38.5**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. Cumulative 2030 No Project conditions assume the reconstruction of the Harney Way interchange, as well as the extension of Geneva Avenue from Bayshore Boulevard east to the reconstructed interchange.
3. Ramp junctions at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

Table 55
Ramp Junction LOS
Project and Project Variants Conditions - Sunday PM Peak Hour

Ramp Location	Existing		2030 No Project		Project		Project-Var. 1 (R&D)		Project-Var. 2 (Housing)	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101										
NB on from Sierra Point Parkway	B	19.3	A	9.1	A	9.8	A	9.8	A	9.8
NB on from Harney Way[2]	B	19.5	D	33.0	**E**	**35.1**	**E**	**35.2**	**E**	**35.3**
NB on from Bayshore	B	16.8	C	21.9	C	22.4	C	22.4	C	21.9
NB on from Alemany/Industrial	C	23.5	C	24.6	C	25.6	C	25.7	C	24.6
NB on from Bayshore/Cesar	C	26.1	D	31.7	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB off to Bayshore/Cesar Chavez	**E**	**37.5**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Cesar Chavez/Potrero	D	30.6	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Alemany/San Bruno	B	17.3	C	21.2	C	22.5	B	22.5	C	22.5
SB on from Third/Bayshore	B	16.5	C	23.9	D	26.1	C	26.1	C	25.9
SB on from Harney/Geneva[2]	B	18.7	C	24.8	D	29.8	C	29.8	D	29.5
SB on from Sierra Point/Lagoon	B	18.3	C	21.6	C	22.6	C	22.6	C	22.4
I-280										
NB off to Cesar Chavez	B	19.2	C	26.0	D	26.0	C	26.0	C	26.0
NB on from Indiana/25th	B	18.4	C	25.6	D	25.8	C	26.2	C	26.0
SB off to Pennsylvania/25th	C	27.0	D	30.7	D	30.9	D	31.1	D	31.1
SB on from Pennsylvania/25th	C	26.4	D	29.5	D	29.5	D	29.2	D	29.5

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. Cumulative 2030 No Project conditions assume the reconstruction of the Harney Way interchange, as well as the extension of Geneva Avenue from Bayshore Boulevard east to the reconstructed interchange.
3. Ramp junctions at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

Table 56
Summary of Impacts at Ramp Junctions Operating at LOS E or LOS F

Ramp Location	Project	P-Var 1 (R&D)	P-Var 2 (Housing)	Alt 1 No Project	Alt 2 No Bridge	Alt 3 49ers at Stick	Alt 4 Lesser Build	Alt 5 No Park Agree
U.S. 101								
NB on from Sierra Point Parkway	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC
NB on from Harney Way[2]	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	NSC	SC/PI	SC/PI
NB on from Bayshore	--	--	--	--	--	--	--	--
NB on from Alemany/Industrial	PI	PI	PI	NP Impact	PI	NSC	NSC	PI
NB on from Bayshore/Cesar	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
SB off to Bayshore/Cesar Chavez	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
SB on from Cesar Chavez/Potrero	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC
SB on from Alemany/San Bruno	--	--	--	--	--	--	--	--
SB on from Third/Bayshore	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
SB on from Harney/Geneva[2]	PI	PI	PI	NP Impact	PI	SC/PI	SC/PI	PI
SB on from Sierra Point/Lagoon	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC
I-280								
NB off to Cesar Chavez	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
NB on from Indiana/25th	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
SB off to Pennsylvania/25th	SC/PI	SC/PI	SC/PI	NP Impact	SC/PI	SC/PI	SC/PI	SC/PI
SB on from Pennsylvania/25th	NSC	NSC	NSC	NP Impact	NSC	NSC	NSC	NSC

Notes:
1. PI – Project Impact. Project results in a change in ramp merge/diverge from LOS D or better under 2030 No Project conditions, to LOS E or LOS F with the Project, Project Variants, or Project Alternatives.
2. NSC – No Significant Contribution. Project would not contribute significantly to ramp merge/diverges operating at LOS E or LOS F under 2030 No Project conditions. No impacts.
3. SC/PI – Significant Contribution/Project Impact. Project would contribute significantly to ramp merge/diverges operating at LOS E or LOS F under 2030 No Project conditions, resulting in a Project Impact.

Table 57
Freeway Diverge Queue Storage
Project and Project Variant Conditions - Weekday AM Peak Hour

Ramp Location	Ramp Storage	Existing	2030 No Project	Project	Project – Variant 1 (R&D)	Project – Variant 2 (Housing)
		95th % Queue[1]	95th % Queue	95th % Queue	95th % Queue	95th % Queue
U.S. 101						
NB off to Harney Way[2]	2,800	< 100	1,725	2,350	2,500	2,350
NB off to Bayshore/Cesar Chavez	750	400	**Spillback**	**Spillback**	**Spillback**	**Spillback**
SB off to San Bruno/Silliman	600	225	225	225	225	225
SB off to San Bruno/Mansell	650	< 100	< 100	<100	< 100	< 100
SB off to Bayshore/Hester	1,700	225	275	275	275	275
SB off to Harney/Geneva[2]	1,000	< 100	**Spillback**	**Spillback**	**Spillback**	**Spillback**
SB off to Sierra Point/Lagoon	1,250	< 100	**Spillback**	**Spillback**	**Spillback**	**Spillback**
I-280						
NB off to Cesar Chavez	2,500	1,500	**Spillback**	**Spillback**	**Spillback**	**Spillback**
SB on from Pennsylvania/25th	900	< 100	< 100	< 100	100.0	< 100

Notes:
1. Ramps where there is potential for spillback are highlighted in **bold.**
2. 95th percentile queue is the length of queue that has a probability of 5 percent or less of being exceeded during the peak hour.
3. 2030 No Project conditions assume the reconstruction of the Harney Way Interchange as well as the connection of Geneva Avenue to the reconstructed interchange.

Source: Fehr & Peers.

Table 58
Freeway Diverge Queue Storage
Project and Project Variant Conditions - Weekday PM Peak Hour

Ramp Location	Ramp Storage	Existing	2030 No Project	Project	Project – Variant 1 (R&D)	Project – Variant 2 (Housing)
		95th % Queue[1]	95th % Queue	95th % Queue	95th % Queue	95th % Queue
U.S. 101						
NB off to Harney Way[2]	2,800	< 100	**Spillback**	**Spillback**	**Spillback**	**Spillback**
NB off to Bayshore/Cesar Chavez	750	375	525	525	525	525
SB off to San Bruno/Silliman	600	325	425	425	425	425
SB off to San Bruno/Mansell	650	150	350	350	350	350
SB off to Bayshore/Hester	1,700	225	125	125	125	125
SB off to Harney/Geneva[2]	1,000	< 100	**Spillback**	**Spillback**	**Spillback**	**Spillback**
SB off to Sierra Point/Lagoon	1,250	< 100	1,000	1,000	1,000	1,000
I-280						
NB off to Cesar Chavez	2,500	650	900	900	900	900
SB on from Pennsylvania/25th	900	< 100	875	875	875	875

Notes:
1. Ramps where there is potential for spillback are highlighted in **bold.**
2. 95th percentile queue is the length of queue that has a probability of 5 percent or less of being exceeded during the peak hour.
3. 2030 No Project conditions assume the reconstruction of the Harney Way Interchange as well as the connection of Geneva Avenue to the reconstructed interchange.
Source: Fehr & Peers.

Table 59
Freeway Diverge Queue Storage
Project and Project Variant Conditions - Sunday PM Peak Hour

Ramp Location	Ramp Storage	Existing	2030 No Project	Project	Project – Variant 1 (R&D)	Project – Variant 2 (Housing)
		95th % Queue[1]	95th % Queue	95th % Queue	95th % Queue	95th % Queue
U.S. 101						
NB off to Harney Way[2]	2,800	< 100	1,450	**Spillback**	**Spillback**	2,575
NB off to Bayshore/Cesar Chavez	750	275	350	350	350	350
SB off to San Bruno/Silliman	600	175	250	250	250	250
SB off to San Bruno/Mansell	650	< 100	< 100	100	100	100
SB off to Bayshore/Hester	1,700	300	300	325	350	325
SB off to Harney/Geneva[2]	1,000	< 100	**Spillback**	**Spillback**	**Spillback**	**Spillback**
SB off to Sierra Point/Lagoon	1,250	< 100	125	125	125	125
I-280						
NB off to Cesar Chavez	2,500	300	825	825	825	825
SB on from Pennsylvania/25th	900	< 100	150	175	200	200

Notes:
1. Ramps where there is potential for spillback are highlighted in **bold.**
2. 95th percentile queue is the length of queue that has a probability of 5 percent or less of being exceeded during the peak hour.
3. 2030 No Project conditions assume the reconstruction of the Harney Way Interchange as well as the connection of Geneva Avenue to the reconstructed interchange.

Source: Fehr & Peers.

- U.S. 101 southbound from Third/Bayshore to Alana/Geneva/Harney (AM and PM)
- U.S. 101 southbound from Alana/Geneva/Harney to Sierra Point (AM and PM)

All freeway mainline segments would operate at LOS D or better during the Sunday PM peak hour with the Project.

The Project's contributions to LOS E or LOS F conditions at the four freeway segments would be considered significant impacts. The projected poor operating conditions on the affected freeway segments could only be improved by creating additional mainline capacity, which would require substantial additional right-of-way acquisition, substantial freeway reconstruction, and associated substantial costs, and would require an associated jurisdictional transportation improvement planning, prioritization and fair share funding formulation effort, that exceed the reasonable scope of the Project and reasonable control of the lead agency. More specifically,

- Freeway mainline widening to provide acceptable operational conditions would require acquisition of substantial right-of-way, and substantial and infeasible reconstruction of the affected freeway segments and associated over- and under-crossings, the cost of which far exceed the reasonable capability and responsibility of the Project, and for which no interjurisdictional fair share funding mechanism has been established;
- The co-lead agencies (Planning Department and the Redevelopment Agency) do not have jurisdiction over the affected freeway right-of-way; the necessary right-of-way acquisition would necessarily involve Caltrans use of its eminent domain powers;
- Expansion of portions of the affected freeway segments rights-of-way is constrained by existing topography;
- Acquisition of portions of the necessary additional freeway mainline and associated under- and over-crossing right-of-way, and subsequent construction of the necessary freeway mainline widening and associated under- and over-crossings, could not be achieved without the displacement of existing businesses and households and demolition of existing residential and commercial establishments

Therefore, mitigation of this Project-related contribution to 2030 cumulative freeway congestion impacts to a less-than-significant level is considered to be infeasible. The Project-related contribution to this cumulative freeway segment congestion would be *significant and unavoidable*.

Ramp Junctions

Tables 53 through 55 present the results of the ramp junction merge (on-ramp) and diverge (off-ramp) analysis for Project conditions for the AM, PM, and Sunday peak hours, respectively. **Table 56** presents a summary table of project impacts for Project, Project Variants, and Alternatives to the Project for the ramp analysis locations.

The Project would cause four ramp junctions to deteriorate from acceptable LOS D or better to LOS E or F conditions or from LOS E to LOS F conditions:

- U.S. 101 northbound on-ramp from Alemany/Industrial (PM)
- U.S. 101 northbound on-ramp from Harney Way (Sunday)
- U.S. 101 northbound on-ramp from Bayshore/Cesar Chavez (Sunday)
- U.S. 101 southbound on-ramp from Harney/Geneva (PM)

The Project would result in significant traffic impacts at these locations. Providing additional on-ramp lanes would increase the volume of traffic entering the freeway mainline segment, and may exacerbate the poor merging conditions. As described above, widening of U.S. 101 to provide additional capacity would not be feasible. Thus, mitigation of these impacts has been determined to be infeasible. Project impacts at these locations would be *significant and unavoidable*.

The Project would also contribute cumulatively significant traffic increases at ramp junctions projected to operate at LOS E or LOS F under 2030 No Project conditions:

- U.S. 101 northbound on-ramp from Sierra Point (PM)
- U.S. 101 northbound on-ramp from Harney Way (AM and PM)
- U.S. 101 northbound on-ramp from Alemany/Industrial (AM)
- U.S. 101 northbound on-ramp from Bayshore/Cesar Chavez (AM and PM)
- U.S. 101 southbound off-ramp to Bayshore/Cesar Chavez (AM, PM, and Sunday)
- U.S. 101 southbound on-ramp from Third Street/Bayshore Boulevard (AM and PM)
- U.S. 101 southbound on-ramp from Harney/Geneva (AM)
- U.S. 101 southbound on-ramp from Sierra Point (AM)
- I-280 northbound off-ramp to Cesar Chavez (AM and PM)
- I-280 northbound on-ramp from Indiana/25th Street (AM and PM)
- I-280 southbound off-ramp to Pennsylvania/25th Street (AM and PM)
- I-280 southbound on-ramp from Pennsylvania/25th Street (AM and PM)

The Project would contribute significantly to cumulative impacts at these locations. As described above, no feasible mitigation measures have been identified for the ramp junction locations. Therefore, the Project's contributions to cumulative impacts at the ramp locations would be *significant and unavoidable*.

Tables 57 through 59 present the results of the freeway diverge (off-ramp) queue storage analysis for conditions with the Project. The Project would result in increases in traffic volumes that would cause the U.S. 101 northbound off-ramp to Harney Way to experience queues that may extend back to the upstream freeway mainline segment which could result in unsafe conditions on the freeway mainline. The Project would therefore result in significant traffic impacts at this location.

Project Mitigation Measure 3 provides for the Project Applicant to pay a fair share toward the construction of the Harney Way Interchange Project, which could mitigate for the Project's contributions to this impact. Because the environmental review of the interchange project is not yet complete and the interchange project would be undertaken and approved by Caltrans, the implementation of Project Mitigation Measure 3 is uncertain and is outside the City/Agency jurisdiction. Therefore, Project-related impacts related to freeway diverge queue storage would be *significant and unavoidable*.

The Project would also contribute cumulatively significant traffic increases at off-ramps where queues may extend onto freeway mainline segments under year 2030 No Project Conditions:

- U.S. 101 northbound off-ramp to Harney Way (PM)
- U.S. 101 northbound off-ramp to Bayshore/Cesar Chavez (AM)
- U.S. 101 southbound off-ramp to Harney/Geneva (AM, PM, and Sunday)
- U.S. 101 southbound off-ramp to Sierra Point/Lagoon (AM)
- I-280 northbound off-ramp to Cesar Chavez (AM)

As noted above, Project Mitigation Measure 3 provides for the Project Applicant to pay a fair share toward the construction of the Harney Way Interchange Project, which could mitigate for the Project's contributions to this impact. Because the environmental review of the interchange project is not yet complete and the interchange would be undertaken and approved by Caltrans, the implementation of Project Mitigation Measure 3 is uncertain and is outside the City/Agency jurisdiction. Therefore, Project's contribution to impacts related to freeway diverge queue storage would remain *significant and unavoidable*.

Project Variants

Mainline and Weaving Segments

The Project Variants would create impacts at similar freeway mainline sections to the Project, although the magnitude of impacts may be greater with Project Variants 1 and 2, due to increased traffic generation compared to the Project.

Project Variant 1

Project Variant 1 would result in significant impacts at the same freeway mainline sections as the Project. However, as described in Chapter 5 for 2030 No Project conditions, no feasible mitigation measures have been identified for the freeway segments expected to experience significant impacts under 2030 No Project conditions. Therefore, the Project Variant 1 contributions to LOS E or LOS F freeway operating conditions would be considered *significant and unavoidable*.

Project Variant 2

Project Variant 2 would result in similar significant traffic impacts at freeway mainline segments as the Project. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway segments expected to experience significant impacts under Project conditions. Therefore, the Project Variant 2 contributions to LOS E and LOS F freeway operating conditions would be considered *significant and unavoidable*.

Ramp Junctions

The Project Variants would create impacts at similar freeway ramp junctions to the Project, although the magnitude of impacts may be greater with Project Variants 1 and 2, due to increased traffic generation compared to the Project.

Project Variant 1

Project Variant 1 would create similar significant traffic impacts to freeway ramp junctions as the Project. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway ramp junctions expected to experience significant impacts under Project conditions. Therefore, the Project Variant 1 contributions to deficient freeway operating conditions are considered *significant and unavoidable*.

Project Variant 2

Project Variant 2 would create similar significant traffic impacts to freeway ramp junctions as the Project. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway ramp junctions expected to experience significant impacts under Project conditions. Therefore, the Project Variant 1 contributions to deficient freeway operating conditions are considered *significant and unavoidable*.

The analysis of ramp queuing for Variants 1 and 2 is similar to the analysis of ramp merge and diverge junctions.

Project Variant 1

Project Variant 1 would result in significant impacts with respect to ramp queuing at the same off-ramp locations as the Project. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway off-ramps expected to experience significant impacts under Project conditions. Therefore, the Project Variant 1 contributions to freeway segments operating at LOS E or LOS F conditions would be considered *significant and unavoidable*.

Project Variant 2

Project Variant 2 would result in significant impacts with respect to ramp queuing at the same off-ramp locations as the Project, with one exception. Under Project Variant 2, the U.S. 101 northbound off-ramp to Harney Way would not be likely to experience queues extending back to the mainline in the Sunday peak hour. However, the Project Variant 2 contributions to all other off-ramps expected to experience significant traffic impacts associated with queuing under Project conditions would be the same as the Project. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway off-ramps expected to experience significant impacts under Project conditions. Therefore, the Project Variant 2 contributions to freeway segments operating at LOS E or LOS F would be considered *significant and unavoidable*.

6.1.2 Alternatives to the Project

Transportation Study Appendix E contains the intersection turning movement volumes at the study intersections for existing and future conditions in table format, while Transportation Study Appendix F contains the intersection LOS analysis calculation sheets.

Intersection Operations

Tables 60 and 61 presents a comparison of the intersection LOS analysis for the Alternatives to the Project for the weekday AM and PM peak hours, respectively. **Table 62** presents this comparison for Sunday PM peak hour conditions. **Table 48** on page 175 presented the summary table of project impacts for the Alternatives to the Project.

Alternative 1 – No Project: Alternative 1 assumes that development within Hunters Point Shipyard would occur per the approved plans for Phase I. No development within Candlestick Point was assumed. Under the 2030 No Project conditions, 38 of the 60 intersections would operate at LOS E or LOS F (as compared with three intersections under existing conditions). The intersections include:

- Third/25th
- Third/Cargo
- Third/Evans
- Third/Palou
- Third/Gilman/Paul
- 25th/Pennsylvania
- Cesar Chavez/Pennsylvania/I-280 northbound off-ramp
- Cesar Chavez/Evans
- Bayshore/Paul
- Bayshore/Hester/U.S. 101 southbound off-ramp
- Bayshore/Tunnel
- Bayshore/Bacon/Egbert/Phelps
- Bayshore/Arleta
- Bayshore/Leland
- Bayshore/Visitacion
- Bayshore/Sunnydale

- Tunnel Blanken
- Geneva/U.S. 101 southbound ramps (existing Alana/Beatty)
- Harney/U.S. 101 northbound ramps (existing Alana/Harney/Thomas Mellon)
- Harney/Jamestown
- Crisp/Palou/Griffith
- Arelious Walker/Gilman
- Amador/Cargo/Illinois
- Bayshore/Cortland
- Bayshore/Alemany/Industrial
- Bayshore/U.S. 101 northbound off-ramp/Jerrold
- Bayshore/Silver
- Bayshore/Blanken
- San Bruno/Paul
- San Bruno/Silver
- San Bruno/Mansell/U.S. 101 southbound off-ramp
- San Bruno/Silliman/U.S. 101 southbound ramps
- Evans/Jennings
- Bayshore/Geneva
- Bayshore/Old County
- Sierra Point Parkway/U.S. 101 southbound ramps/Lagoon Way
- Third/Jerrold
- Evans/Napoleon/Toland

As indicated in section 4.3, a number of intersection improvements would be implemented as part of conditions of approval placed on development projects by the Planning Department and the Redevelopment Agency. For the intersections of Cesar Chavez/Evans and Third/Evans, the Hunters Point Shipyard Development Plan's Mitigation Monitoring and Reporting Program included an improvement at the intersection of Cesar Chavez/Evans, which have not been assumed for the 2030 No Project condition due to its infeasibility.

Cesar Chavez/Evans – The Hunters Point Shipyard Redevelopment Plan's mitigation measure identified reconfiguration of the northbound approach of Evans Avenue to Cesar Chavez Street to provide exclusive northbound left and right turn lanes, and changing the signal timing plan to include the exclusive left turn and right turn movements. The measure identified that the southeast corner curb return would require structural modifications to the existing viaduct. DPW, as part of the BTI Project analysis, identified widening of the existing structure supporting the Evans Avenue and Cesar Chavez Street intersection as infeasible.

Table 60
Intersection LOS
Alternatives to the Project – Weekday AM Peak Hour – 2030 Conditions

	Intersection	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Third/25th	**>80/1.43**	**F**	**>80/1.54**	**F**	**>80/1.39**	**F**	**>80/1.41**	**F**	**>80/1.53**	**F**
2	Third/Cesar Chavez	**>80/1.61**	**F**	**>80/1.63**	**F**	**>80/1.58**	**F**	**>80/1.61**	**F**	**>80/1.63**	**F**
3	Third/Cargo Way	**>80/1.36**	**F**	**>80/1.90**	**F**	**>80/1.33**	**F**	**>80/1.84**	**F**	**>80/1.90**	**F**
4	Third/Evans	**>80/1.41**	**F**	**>80/1.43**	**F**	**>80/1.36**	**F**	**>80/1.38**	**F**	**>80/1.44**	**F**
5	Third/Oakdale	21	C	25	C	20	C	23	C	24	C
6	Third/Palou	**>80/1.77**	**F**	**>80/1.91**	**F**	**>80/1.81**	**F**	**>80/1.75**	**F**	**>80/1.97**	**F**
7	Third/Revere	35	C	51	D	36	D	41	D	46	D
8	Third/Carroll	12	B	23	C	12	B	18	B	19	B
9	Third/Paul	**>80/1.23**	**F**	**>80/2.00**	**F**	**>80/1.30**	**F**	**>80/1.82**	**F**	**>80/1.89**	**F**
10	Third/Ingerson	5	A	6	A	5	A	6	A	6	A
11	Third/Jamestown	29	C	**>80/1.03**	**F**	30	C	49	D	**77/0.99**	**E**
12	Third/Le Conte/101 nb off	50	D	50	D	51	D	50	D	50	D
13	25th/Illinois	14	B	13	B	13	B	13	B	13	B
14	25th/Pennsylvania	26	D	29	C	29	C	29	C	29	C
15	Cesar Chavez/Penns/I-280	**>80/1.39**	**F**	**>80/1.39**	**F**	**>80/1.39**	**F**	**>80/1.39**	**F**	**>80/1.39**	**F**
16	Cesar Chavez St/Evans	**>80/1.92**	**F**	**>80/1.91**	**F**	**>80/1.92**	**F**	**>80/1.90**	**F**	**>80/1.92**	**F**
17	Cesar Chavez St/Illinois	25	C	34	C	24	C	23	C	24	C
18	Bayshore/Paul	**61/1.56**	**E**	**>80/2.64**	**F**	**70/1.68**	**E**	**>80/2.45**	**F**	**>80/2.63**	**F**
19	Bayshore/Hester/101 sb off	**>80/1.34**	**F**	**>80/1.36**	**F**	**>80/1.34**	**F**	**>80/1.35**	**F**	**>80/1.36**	**F**
20	Bayshore/Tunnel	**>80/2.00**	**F**	**>80/2.05**	**F**	**>80/2.00**	**E**	**>80/2.05**	**E**	**>80/2.05**	**F**

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
Source: Fehr & Peers.

Table 60 (continued)
Intersection LOS
Alternatives to the Project – Weekday AM Peak Hour – 2030 Conditions

	Intersection	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
21	Bayshore/Bacon	**>80/4.05**	**F**	**>80/4.08**	**F**	**>80/4.15**	**F**	**>80/4.01**	**F**	**>80/4.18**	**F**
22	Bayshore/Arleta	**>80/1.21**	**F**	**>80/1.23**	**F**	**>80/1.21**	**F**	**>80/1.22**	**F**	**>80/1.23**	**F**
23	Bayshore/Leland	**>80/1.24**	**F**	**>80/1.26**	**F**	**>80/1.24**	**F**	**>80/1.25**	**F**	**>80/1.26**	**F**
24	Bayshore/Visitacion	**>80/1.55**	**F**	**>80/1.56**	**F**	**>80/1.55**	**F**	**>80/1.56**	**F**	**>80/1.56**	**F**
25	Bayshore/Sunnydale	**>80/1.32**	**F**	**>80/1.34**	**F**	**>80/1.32**	**F**	**>80/1.33**	**F**	**>80/1.34**	**F**
26	Tunnel/Blanken	43	D	**>80/1.06**	**F**	44	D	**>80/1.06**	**F**	**>80/1.06**	**F**
27	Geneva/U.S. 101 SB Ramps [3]	**>80/2.17**	**F**	**>80/2.31**	**F**	**>80/2.17**	**F**	**>80/2.31**	**F**	**>80/2.31**	**F**
28	Harney/U.S. 101 NB Ramps [3]	**>80/1.20**	**F**	**>80/1.35**	**F**	**>80/1.20**	**F**	**>80/1.35**	**F**	**>80/1.35**	**F**
29	Harney/Jamestown [4]	12	B	20	B	11	B	23	C	22	B
30	Crisp/Palou [4]	**57/0.99**	**E**	44	D	39	D	39	D	42	D
31	Ingalls/Thomas [4]	19.0 (wb)	C	22	C	21.7 (wb)	C	20	B	22	C
32	Ingalls/Carroll [4]	15	B	28	C	16	C	27	C	28	C
33	Ingalls/Egbert	8	A	9	A	8	A	9	A	9	A
34	A.Walker/Gilman [4]	**>60 (eb)**	**F**	30	C	**>60 (eb)**	**F**	31	C	31	C
35	Amador/Cargo	**65/1.06**	**E**	54	D	**56/1.01**	**E**	48	D	**56/1.02**	**E**
36	Bayshore/Cortland	37	D	**>80/1.18**	**F**	37	D	**>80/1.18**	**F**	**>80/1.18**	**F**
37	Bayshore/Oakdale	43	D	51	D	43	D	49	D	50	D
38	Bayshore/Alemany/Industrial	**>80/1.00**	**F**	**>80/1.05**	**F**	**>80/1.01**	**F**	**>80/1.03**	**F**	**>80/1.04**	**F**
39	Bayshore/101 nb off to Cesar	**74/0.91**	**E**	**>80/0.94**	**F**	**77/0.91**	**E**	**>80/0.93**	**F**	**>80/0.93**	**F**
40	Bayshore/Silver	**>80/1.58**	**F**	**>80/1.70**	**F**	**>80/1.61**	**F**	**>80/1.63**	**F**	**>80/1.75**	**F**

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

Table 60 (continued)
Intersection LOS
Alternatives to the Project – Weekday AM Peak Hour – 2030 Conditions

	Intersection	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
41	Bayshore/Blanken	**>80/1.48**	**F**	**>80/1.51**	**F**	**>80/1.48**	**F**	**>80/1.51**	**F**	**>80/1.51**	**F**
42	San Bruno/Paul	**>80/1.21**	**F**	**>80/1.23**	**F**	**>80/1.19**	**F**	**>80/1.22**	**F**	**>80/1.23**	**F**
43	San Bruno/Silver	**>80/1.43**	**F**	**>80/1.41**	**F**	**>80/1.41**	**F**	**>80/1.40**	**F**	**>80/1.41**	**F**
44	S. Bruno/Mansell/101 sb off	**>80/1.08**	**F**	**>80/1.11**	**F**	**64/1.09**	**F**	**68/1.11**	**F**	**>80/1.11**	**F**
45	S. Bruno/Silliman/101 sb off	**>80/1.08**	**F**	**>80/1.08**	**F**	**>80/1.07**	**F**	**>80/1.08**	**F**	**>80/1.07**	**F**
46	Innes/A.Walker [4]	5	A	6	A	5	A	6	A	5	A
47	Innes/Earl	17.3 (sb)	C	13.3 (sb)	B	17.1 (sb)	C	12.5 (sb)	B	15.0 (sb)	B
48	Evans/Jennings	**>80/1.96**	**F**	28	C	28	C	24	C	30	C
49	Bayshore/Geneva	**>80/1.39**	**F**	**>80/1.40**	**F**	**>80/1.39**	**F**	**>80/1.39**	**F**	**>80/1.40**	**F**
50	Bayshore/Guadalupe	21	C	21	C	21	C	21	C	21	C
51	Bayshore/Valley	20	C	20	C	20	C	20	C	20	C
52	Bayshore/Old County	40	D	39	D	39	D	39	D	39	D
53	Sierra Pt/Lagoon/101 sb off	**>80/1.85**	**F**	**>80/1.85**	**F**	**>80/1.85**	**F**	**>80/1.85**	**F**	**>80/1.85**	**F**
54	Ingalls/Palou [4]	16	B	18	B	16	B	18	B	18	B
55	Keith/Palou [4]	10	A	9	A	10	A	10	A	10	A
56	Third/Williams/Van Dyke	18	B	30	C	18	B	27	C	29	C
57	Third/Jerrold	49	D	**>80/0.74**	**F**	**56/0.64**	**E**	**>80/0.71**	**F**	**>80/0.73**	**F**
58	Evans/Napoleon/Toland	**>80/1.45**	**F**	**>80/1.50**	**F**	**>80/1.43**	**F**	**>80/1.48**	**F**	**>80/1.50**	**F**
59	Harney/Executive Park East	25	C	25	C	25	C	25	C	25	C
60	Harney/Thomas Mellon	30	C	34	C	32	C	34	C	34	C

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

Table 61
Intersection LOS
Alternatives to the Project – Weekday PM Peak Hour – 2030 Conditions

	Intersection	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Third/25th	**>80/2.45**	**F**	**>80/2.92**	**F**	**>80/2.51**	**F**	**>80/2.77**	**F**	**>80/2.93**	**F**
2	Third/Cesar Chavez	**>80/1.56**	**F**	**>80/1.76**	**F**	**>80/1.60**	**F**	**>80/1.70**	**F**	**>80/1.75**	**F**
3	Third/Cargo Way	**>80/1.44**	**F**	**>80/1.74**	**F**	**>80/1.49**	**F**	**>80/1.68**	**F**	**>80/1.74**	**F**
4	Third/Evans	**>80/1.36**	**F**	**>80/1.53**	**F**	**>80/1.44**	**F**	**>80/1.47**	**F**	**>80/1.56**	**F**
5	Third/Oakdale	30	C	**60/1.12**	**E**	33	C	53	D	**60/1.12**	**E**
6	Third/Palou	**>80/4.71**	**F**	**>80/5.99**	**F**	**>80/5.08**	**F**	**>80/5.37**	**F**	**>80/6.07**	**F**
7	Third/Revere	37	D	**>80/1.14**	**F**	39	D	**80/1.10**	**F**	**>80/1.14**	**F**
8	Third/Carroll	14	B	**75/0.93**	**E**	15	B	**56/0.86**	**E**	**67/0.92**	**E**
9	Third/Paul	**>80/1.37**	**F**	**>80/3.36**	**F**	**>80/1.49**	**F**	**>80/2.87**	**F**	**>80/3.32**	**F**
10	Third/Ingerson	7	A	43	D	7	A	40	D	52	D
11	Third/Jamestown	30	C	**>80/6.64**	**F**	32	C	**>80/1.21**	**F**	**>80/6.15**	**F**
12	Third/Le Conte/101 nb off	24	C	23	C	23	C	23	C	23	C
13	25th/Illinois	14	B	14	B	14	B	13	B	14	B
14	25th/Pennsylvania	**>80/1.42**	**F**	40	D	40	D	40	D	40	D
15	Cesar Chavez/Penns/I-280	**>80/1.36**	**F**	**>80/1.37**	**F**	**>80/1.37**	**F**	**>80/1.36**	**F**	**>80/1.37**	**F**
16	Cesar Chavez St/Evans	**>80/1.83**	**F**	**>80/1.84**	**F**	**>80/1.84**	**F**	**>80/1.83**	**F**	**>80/1.84**	**F**
17	Cesar Chavez St/Illinois	22	C	23	C	23	C	22	C	23	C
18	Bayshore/Paul	**>80/2.00**	**F**	**>80/2.90**	**F**	**>80/2.03**	**F**	**>80/2.70**	**F**	**>80/2.93**	**F**
19	Bayshore/Hester/101 sb off	**>80/1.25**	**F**	**>80/1.28**	**F**	**>80/1.25**	**F**	**>80/1.28**	**F**	**>80/1.28**	**F**
20	Bayshore/Tunnel	**>80/2.30**	**F**	**>80/2.51**	**F**	**>80/2.34**	**F**	**>80/2.47**	**F**	**>80/2.51**	**F**

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

Table 61 (continued)
Intersection LOS
Alternatives to the Project – Weekday PM Peak Hour – 2030 Conditions

	Intersection	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
21	Bayshore/Bacon	**>80/1.87**	**F**	**>80/1.91**	**F**	**>80/1.92**	**F**	**>80/1.91**	**F**	**>80/1.95**	**F**
22	Bayshore/Arleta	**>80/1.36**	**F**	**>80/1.39**	**F**	**>80/1.36**	**F**	**>80/1.39**	**F**	**>80/1.39**	**F**
23	Bayshore/Leland	**>80/1.58**	**F**	**>80/1.67**	**F**	**>80/1.58**	**F**	**>80/1.66**	**F**	**>80/1.67**	**F**
24	Bayshore/Visitacion	**>80/1.43**	**F**	**>80/1.47**	**F**	**>80/1.43**	**F**	**>80/1.47**	**F**	**>80/1.47**	**F**
25	Bayshore/Sunnydale	**>80/1.15**	**F**	**>80/1.19**	**F**	**>80/1.15**	**F**	**>80/1.19**	**F**	**>80/1.19**	**F**
26	Tunnel/Blanken	**>80/1.46**	**F**	**>80/1.45**	**F**	**>80/1.46**	**F**	**>80/1.45**	**F**	**>80/1.45**	**F**
27	Geneva/U.S. 101 SB Ramps [3]	**>80/2.94**	**F**	**>80/3.25**	**F**	**>80/2.97**	**F**	**>80/3.19**	**F**	**>80/3.25**	**F**
28	Harney/U.S. 101 NB Ramps [3]	**>80/1.43**	**F**	**>80/1.74**	**F**	**>80/1.46**	**F**	**>80/1.69**	**F**	**>80/1.74**	**F**
29	Harney/Jamestown [4]	**40/1.03**	**E**	41	D	**61/1.18**	**F**	31	C	41	D
30	Crisp/Palou [4]	**58/0.97**	**E**	54	D	48	D	46	D	55	D
31	Ingalls/Thomas [4]	27.9 (wb)	C	33	C	**40.7 (wb)**	**E**	28	C	33	C
32	Ingalls/Carroll [4]	17	C	38	D	28	D	33	C	38	D
33	Ingalls/Egbert	9	A	9	A	9	A	9	A	9	A
34	A.Walker/Gilman [4]	**>60 (eb)**	**F**	36	D	**>60 (eb)**	**F**	34	C	36	D
35	Amador/Cargo	**60/1.05**	**E**	**59/1.04**	**E**	**62/1.05**	**E**	50	D	**60/1.05**	**E**
36	Bayshore/Cortland	**>80/1.48**	**F**	**>80/1.87**	**F**	**>80/1.49**	**F**	**>80/1.85**	**F**	**>80/1.87**	**F**
37	Bayshore/Oakdale	33	C	55	D	34	C	52	D	**55/1.05**	**E**
38	Bayshore/Alemany/Industrial	**>80/1.23**	**F**	**>80/1.18**	**F**	**>80/1.24**	**F**	**>80/1.15**	**F**	**>80/1.18**	**F**
39	Bayshore/101 nb off to Cesar	**>80/0.88**	**F**	**>80/0.91**	**F**	**>80/0.89**	**F**	**>80/0.91**	**F**	**>80/0.91**	**F**
40	Bayshore/Silver	**>80/2.64**	**F**	**>80/2.91**	**F**	**>80/2.89**	**F**	**>80/2.91**	**F**	**>80/2.91**	**F**

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

Table 61 (continued)
Intersection LOS
Alternatives to the Project – Weekday PM Peak Hour – 2030 Conditions

	Intersection	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
41	Bayshore/Blanken	**>80/1.33**	**F**	**>80/1.40**	**F**	**>80/1.34**	**F**	**>80/1.40**	**F**	**>80/1.40**	**F**
42	San Bruno/Paul	**>80/2.10**	**F**	**>80/2.71**	**F**	**>80/2.17**	**F**	**>80/2.56**	**F**	**>80/2.75**	**F**
43	San Bruno/Silver	**>80/1.46**	**F**	**>80/1.56**	**F**	**>80/1.56**	**F**	**>80/1.55**	**F**	**>80/1.57**	**F**
44	S. Bruno/Mansell/101 sb off	**64/1.15**	**F**	**>80/1.22**	**F**	**64/1.15**	**F**	**78/1.20**	**F**	**>80/1.20**	**F**
45	S. Bruno/Silliman/101 sb off	38	D	38	D	38	D	38	D	38	D
46	Innes/A.Walker [4]	5	A	6	A	5	A	6	A	6	A
47	Innes/Earl	23.1 (sb)	C	19.4 (sb)	C	24.8 (sb)	C	16.5 (sb)	C	19.7 (sb)	C
48	Evans/Jennings	**>80/2.41**	**F**	31	C	33	C	27	C	33	C
49	Bayshore/Geneva	**>80/1.73**	**F**	**>80/1.76**	**F**	**>80/1.74**	**F**	**>80/1.75**	**F**	**>80/1.76**	**F**
50	Bayshore/Guadalupe	50	D	49	D	50	D	49	D	49	D
51	Bayshore/Valley	40	D	40	D	40	D	40	D	40	D
52	Bayshore/Old County	**>80/1.10**	**F**	**>80/1.13**	**F**	**>80/1.10**	**F**	**>80/1.13**	**F**	**>80/1.13**	**F**
53	Sierra Pt/Lagoon/101 sb off	**>80/4.38**	**F**	**>80/4.38**	**F**	**>80/4.38**	**F**	**>80/4.38**	**F**	**>80/4.38**	**F**
54	Ingalls/Palou [4]	16	B	22	C	17	B	20	C	22	C
55	Keith/Palou [4]	8	A	8	A	8	A	8	A	8	A
56	Third/Williams/Van Dyke	17	B	**>80/0.98**	**F**	17	B	**>80/0.95**	**F**	**>80/0.98**	**F**
57	Third/Jerrold	**>80/0.72**	**F**	**>80/0.88**	**F**	**>80/0.75**	**F**	**>80/0.87**	**F**	**>80/0.89**	**F**
58	Evans/Napoleon/Toland	**>80/1.53**	**F**	**>80/1.61**	**F**	**>80/1.53**	**F**	**>80/1.60**	**F**	**>80/1.62**	**F**
59	Harney/Executive Park East	25	C	26	C	26	C	26	C	27	C
60	Harney/Thomas Mellon	19	B	26	C	20	B	24	C	26	C

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

Table 62
Intersection LOS
Alternatives to the Project – Sunday PM Peak Hour – 2030 Conditions

	Intersection	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Third/25th	**63/0.57**	**E**	**58/0.70**	**E**	**68/0.63**	**E**	**56/0.67**	**E**	**61/0.74**	**E**
2	Third/Cesar Chavez	31	C	**66/0.73**	**E**	36	D	53	D	**>80/0.78**	**F**
3	Third/Cargo Way	30	C	30	C	31	C	28	C	33	C
4	Third/Evans	**57/0.65**	**E**	**59/0.87**	**E**	**74/0.80**	**E**	**51/0.80**	**D**	**67/0.91**	**E**
5	Third/Oakdale	14	C	15	B	14	B	14	B	15	B
6	Third/Palou	**>80/0.92**	**F**	**>80/4.03**	**F**	**>80/1.73**	**F**	**>80/2.70**	**F**	**>80/2.51**	**F**
7	Third/Revere	20	B	24	C	20	B	22	C	24	C
8	Third/Carroll	10	B	**55/0.66**	**E**	11	B	40	D	**60/0.65**	**E**
9	Third/Paul	**64/0.73**	**E**	**>80/1.89**	**F**	**>80/0.82**	**F**	**>80/1.67**	**F**	**>80/1.82**	**F**
10	Third/Ingerson	3	A	27	C	3	A	24	C	27	C
11	Third/Jamestown	24	C	**>80/1.24**	**F**	24	C	**>80/1.06**	**F**	**>80/1.14**	**F**
12	Third/Le Conte/101 nb off	14	B	13	B	14	B	14	B	14	B
13	25th/Illinois	10	A	10	A	10	A	10	A	10	A
14	25th/Pennsylvania	**45/1.01**	**E**	34	C	34	C	34	C	34	C
15	Cesar Chavez/Penns/I-280	**61/0.65**	**E**	**60/0.65**	**E**	**60/0.65**	**E**	**61/0.65**	**E**	**60/0.65**	**E**
16	Cesar Chavez St/Evans	18	B	19	B	19	B	19	B	19	B
17	Cesar Chavez St/Illinois	18	B	18	B	18	B	18	B	18	B
18	Bayshore/Paul	14	B	54	D	15	B	42	D	55	D
19	Bayshore/Hester/101 sb off	14	B	14	B	14	B	14	B	14	B
20	Bayshore/Tunnel	53	D	**60/1.59**	**E**	53	D	**59/1.56**	**E**	**60/1.59**	**E**

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
Source: Fehr & Peers.

Table 62 (continued)
Intersection LOS
Alternatives to the Project – Sunday PM Peak Hour – 2030 Conditions

	Intersection	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
21	Bayshore/Bacon	17	B	30	C	18	B	29	C	30	C
22	Bayshore/Arleta	54	D	49	D	55	D	49	D	49	D
23	Bayshore/Leland	41	D	38	D	42	D	38	D	38	D
24	Bayshore/Visitacion	**64/0.98**	**E**	**70/1.03**	**E**	**64/0.98**	**E**	**69/1.02**	**E**	**69/1.02**	**E**
25	Bayshore/Sunnydale	55	D	55	D	**56/0.79**	**E**	55	D	55	D
26	Tunnel/Blanken	30	C	51	D	30	C	51	D	51	D
27	Geneva/U.S. 101 SB Ramps [3]	**>80/2.04**	**F**	**>80/2.34**	**F**	**>80/2.09**	**F**	**>80/2.32**	**F**	**>80/2.36**	**F**
28	Harney/U.S. 101 NB Ramps [3]	54	D	**>80/1.36**	**F**	**61/1.08**	**E**	**>80/1.27**	**F**	**>80/1.28**	**F**
29	Harney/Jamestown [4]	22	C	24	C	**37/0.99**	**E**	21	C	24	C
30	Crisp/Palou [4]	37	D	46	D	**73/1.08**	**E**	44	D	44	D
31	Ingalls/Thomas [4]	11.8 (wb)	B	26	C	13.9 (wb)	B	24	C	25	C
32	Ingalls/Carroll [4]	9	A	28	C	12	B	27	C	27	C
33	Ingalls/Egbert	8	A	8	A	8	A	8	A	8	A
34	A.Walker/Gilman [4]	**72.5 (eb)**	**F**	36	D	**>80 (eb)**	**F**	35	D	36	D
35	Amador/Cargo	21	C	20	B	23	C	20	B	20	C
36	Bayshore/Cortland	23	C	25	C	23	C	25	C	25	C
37	Bayshore/Oakdale	21	C	21	C	21	C	21	C	21	C
38	Bayshore/Alemany/Industrial	40	D	52	D	41	D	49	D	51	D
39	Bayshore/101 nb off to Cesar	25	C	26	C	25	C	26	C	26	C
40	Bayshore/Silver	19	B	26	C	21	C	24	C	26	C

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

Table 62 (continued)
Intersection LOS
Alternatives to the Project – Sunday PM Peak Hour – 2030 Conditions

	Intersection	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
		Delay [1]	LOS [2]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
41	Bayshore/Blanken	51	D	**68/1.16**	**E**	51	D	**66/1.16**	**E**	**68/1.16**	**E**
42	San Bruno/Paul	39	D	**>80/1.46**	**F**	**56/0.98**	**E**	**>80/1.39**	**F**	**>80/1.36**	**F**
43	San Bruno/Silver	**>80/1.29**	**F**	**>80/1.40**	**F**	**>80/1.37**	**F**	**>80/1.37**	**F**	**>80/1.37**	**F**
44	S. Bruno/Mansell/101 sb off	27	D	**38/1.00**	**E**	27	D	**38/1.00**	**E**	**36/0.98**	**E**
45	S. Bruno/Silliman/101 sb off	**78/0.36**	**E**	**70/0.37**	**E**	**77/0.36**	**E**	**77/0.36**	**E**	**77/0.36**	**E**
46	Innes/A.Walker [4]	4	A	6	A	4	A	6	A	5	A
47	Innes/Earl	9.9 (sb)	A	10 (sb)	B	10.4 (sb)	B	10.0 (sb)	A	10.5 (sb)	B
48	Evans/Jennings	33	D	20	C	20	C	20	B	20	C
49	Bayshore/Geneva	44	D	43	D	44	D	43	D	43	D
50	Bayshore/Guadalupe	9	A	9	A	9	A	9	A	9	A
51	Bayshore/Valley	10	A	10	A	10	A	10	A	10	B
52	Bayshore/Old County	43	D	42	D	44	D	42	D	42	D
53	Sierra Pt/Lagoon/101 sb off	43	D	**44/1.01**	**E**	**44/1.01**	**E**	**44/1.01**	**E**	**44/1.01**	**E**
54	Ingalls/Palou [4]	16	B	22	C	16	B	22	C	20	C
55	Keith/Palou [4]	10	B	7	A	8	A	8	A	8	A
56	Third/Williams/Van Dyke	14	B	23	C	13	B	21	C	23	C
57	Third/Jerrold	23	C	31	C	24	C	29	C	34	C
58	Evans/Napoleon/Toland	**57/0.50**	**E**	**60/0.57**	**E**	**56/0.54**	**E**	**60/0.56**	**E**	**60/0.58**	**E**
59	Harney/Executive Park East	18	B	22	C	18	B	16	B	15	B
60	Harney/Thomas Mellon	15	B	19	B	15	B	15	B	15	B

Notes:
1. Delay in seconds per vehicle. For Side Street STOP-controlled 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** and overall intersection volume-to-capacity (v/c) ratio is presented.
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.
Source: Fehr & Peers.

With the planned construction of a Class II bicycle lane on Cesar Chavez Street, which would remove an eastbound travel lane on Cesar Chavez Street, the operations at this intersection are expected to deteriorate even further. As a result, widening the Evans Avenue viaduct to provide an additional lane on Evans Avenue may not offer a substantial benefit, since the primary constraint would be on Cesar Chavez Street.

Third/Evans – The Hunters Point Shipyard Redevelopment Plan included a mitigation measure at the intersection of Third/Evans which proposed that the southbound left turn lane be eliminated and left turns be rerouted via Phelps Street to Evans Avenue. The mitigation measure also called for signalization of the intersection of Phelps/Evans and removal of on-street parking on Phelps Street and Evans Avenue. The intersection of Phelps Street and Evans Avenue has recently been signalized and on-street parking has been removed along Phelps Street and Evans Avenue, although the removal of the southbound left-turn movement from Third Street to Evans Avenue has not been implemented. Evaluation of intersection operating conditions with the rerouting of southbound left turns indicated that the elimination of the southbound left turn lane and rerouting of traffic to Phelps Street would not substantially improve intersection operating conditions and overall intersection operations would remain at LOS F

Alternative 2 – No Bridge: Alternative 2 would be the same as the Project, except that the bridge across Yosemite Slough would not be constructed. Because the Yosemite Slough bridge would not accommodate auto travel on non-game days, the traffic circulation patterns are expected to be the same under Alternative 2 as the Project.

Without the bridge across Yosemite Slough, the proposed new BRT route traveling between Balboa Park BART Station and the Hunters Point Shipyard Transit Center would be follow a different alignment than under the Project. Instead of a direct route across Yosemite Slough, the BRT route would travel west along Carroll Avenue, north along Hawes Street, and then west on Armstrong Avenue, where it would join the Navy railroad right-of-way. The BRT route would travel in the railroad right-of-way around Yosemite Slough, rejoining the existing roadway network at Shafter Avenue. The route would continue east on Shafter Avenue to Arelious Walker, where it would reassume the same alignment as the Project. Operation of the BRT within the rail right-of-way would not affect study intersection operations. Therefore, the traffic impacts associated with Alternative 2 would be the same as the Project.

Under Alternative 2 conditions, 39 of the 60 study intersections would operate at LOS E or LOS F conditions during the weekday AM or PM, or Sunday PM peak hours. At 10 of the 39 intersections the Alternative 2 would result in project-specific impacts (i.e., project trips would cause intersections expected to operate at LOS D or better under 2030 No Project conditions to operate at LOS E or F, or intersections operating at LOS E under 2030 No Project conditions to deteriorate to LOS F conditions). At the remaining 29 of the 39 intersections that would operate at LOS E or LOS F, Alternative 2 contributions were determined to be less than significant at 9 intersections, and significant at 20 intersections (as identified in Table 48). Therefore, development associated with Alternative 2 would result in significant impacts at 30 intersections (10 project-specific and 20 due to significant contributions to LOS E or LOS F conditions).

No feasible mitigation measures have been identified for 25 of the 30 impacted intersections. The 25 intersections include:

1. Third/25th
2. Third/Cesar Chavez
3. Third/Cargo
4. Third/Evans
5. Third/Oakdale
3. Third/Palou
7. Third/Revere
8. Third/Carroll
9. Third/Paul
11. Third/Jamestown
15. Cesar/Pennsylvania/I-280
18. Bayshore/Paul
21. Bayshore/Bacon
24. Bayshore/Visitacion
25. Bayshore/Sunnydale
36. Bayshore/Cortland
38. Bayshore/Alemany/Industrial
39. Bayshore/U.S. 101 off to Cesar
41. Bayshore/Blanken
42. San Bruno/Paul
43. San Bruno/Silver
44. San Bruno/Mansell/U.S. 101 Southbound Off-ramp
56. Third/Williams/Van Dyke
57. Third/Jerrold
58. Evans/Napoleon/Toland

At the 25 intersections where feasible mitigation measures have not been identified, Alternative 2 impacts would remain *significant and unavoidable.*

At the following five intersections feasible mitigation measures were identified:

26. Tunnel/Blanken
27. Geneva/U.S. 101 southbound ramps (existing Alana/Beatty)
28. Harney/U.S. 101 northbound ramps (existing Alana/Harney/Thomas Mellon)
35.Amador/Cargo/Illinois
49. Bayshore/Geneva

At these intersections, Project Mitigation Measures 2 through 5 would be applicable for Alternative 2. At the intersection of Tunnel/Blanken, with implementation of Project Mitigation Measure 2, operations would improve, but not to acceptable LOS D or better conditions in the AM and PM peak hours. Therefore, project-related impacts at Tunnel/Blanken would be *significant and unavoidable*.

Since implementation of Project Mitigation Measures 3 though 5 are uncertain, Project-related impacts at the four intersections of Geneva/U.S. 101 southbound ramps, Harney/U.S. 101 northbound ramps, Amador/Cargo/Illinois, and Bayshore/Geneva, traffic impacts would remain *significant and unavoidable*.

Alternative 3 – 49ers at Candlestick: Compared to the Project, Alternative 3 would involve less overall development, with slightly more development at the Hunters Point Shipyard and virtually no change to the existing uses at Candlestick Point. Overall, Alternative 3 would result in fewer impacts than those identified for the Project.

Under Alternative 3 conditions, 36 of the 60 study intersections would operate at LOS E or LOS F conditions during the weekday AM or PM, or Sunday PM peak hours. At 3 of the 36 intersections, Alternative 3 would result in project-specific impacts (i.e., project trips would cause intersections expected to operate at LOS D or better under 2030 No Project conditions to operate at LOS E or F, or intersections operating at LOS E under 2030 No Project conditions to deteriorate to LOS F conditions). At the remaining 33 of the 36 intersections that would operate at LOS E or LOS F, Alternative 3 contributions were determined to be less than significant at 24 intersections, and significant at 9 intersections (as identified in Table 48). Therefore, development associated with Alternative 3 would therefore result in impacts at 20 intersections (3 project-specific and 17 with significant contributions to LOS E or LOS F conditions).

No feasible mitigation measures have been identified for 14 of the 20 impacted intersections. The 14 intersections include:

1. Third/25th
2. Third/Cesar Chavez
3. Third/Cargo
4. Third/Evans
6. Third/Palou
9. Third/Paul
15. Cesar/Pennsylvania/I-280
16. Cesar/Evans
18. Bayshore/Paul
21. Bayshore/Bacon
38. Bayshore/Alemany/Industrial
43. San Bruno/Silver

57. Third/Jerrold
58. Evans/Napoleon/Toland

At the 14 intersections where feasible mitigation measures have not been identified, Alternative 3 impacts would remain *significant and unavoidable.*

Project Mitigation Measures 3 through 5 were identified for the following three intersections where Alternative 3 would have significant contributions to cumulative impacts:

27. Geneva/U.S. 101 Southbound Ramps (existing Alana/Beatty)
35. Amador/Cargo
49. Bayshore/Geneva

At these intersections, Project Mitigation Measures 3 through 5 would be applicable for Alternative 3. Since implementation of Project Mitigation Measures 3 though 5 are uncertain, Project-related traffic impacts at the three intersections would remain *significant and unavoidable*.

In addition, Alternative 3 would have project-specific impacts at the following intersections, and mitigation measures were identified:

29. Harney/Jamestown
31. Ingalls/Thomas
34. Arelious Walker/Gilman

29. Harney/Jamestown – At the unsignalized intersection of Harney/Jamestown, the intersection operations would deteriorate in the PM peak hour from LOS E under year 2030 No Project conditions to LOS F with Alternative 3.

> ***Alternative 3 Mitigation Measure 5:*** Install a traffic signal at the intersection of Harney/Jamestown. Implementation of this measure would be the responsibility of SFMTA, and should be implemented when traffic signal warrants are met. Prior to completion of Phase 1 of development, the Project Applicant shall fully fund the cost of signalization improvements.

Implementation of this mitigation measure would reduce Alternative 3 traffic impacts at this intersection to *less than significant* levels.

31. Ingalls/Thomas - At the unsignalized intersection of Ingalls/Thomas, the intersection operating conditions would worsen in the PM peak hour from LOS C under 2030 No Project conditions to LOS E with Alternative 3. (The intersection would operate at LOS C in the AM and PM peak hours with the Project. This intersection would be signalized with the Project, but not under Alternative 3.) Traffic forecasts show that this intersection would meet peak hour traffic signal warrants with buildout of Alternative 3.

The intersection is a side street STOP sign controlled intersection, with movements along Ingalls Street uncontrolled and movements on eastbound and westbound Thomas Avenue controlled by a STOP sign. The degradation in level of service would primarily be due to large increases in traffic along Thomas Avenue attempting to turn left onto southbound Ingalls Street.

> ***Alternative 3 Mitigation Measure 6:*** Install traffic signal at the intersection of Ingalls/Thomas. Implementation of this measure would be the responsibility of SFMTA, and should be implemented when traffic signal warrants are met. Prior to completion of Phase 1 of development, the Project Applicant shall fully fund the cost of signalization improvements. Installation of a traffic signal at the intersection of Ingalls/Thomas intersection would improve intersection operations to LOS D or better conditions.

Implementation of Alternative 3 Mitigation Measure 6 would reduce the impacts at this intersection to *less than significant* levels.

34. Arelious Walker/Gilman – At the unsignalized intersection of Arelious Walker/Gilman, under Alternative 3 the LOS F operating conditions would worsen in the AM and PM peak hours. Peak hour traffic volumes at this intersection would meet signal warrants.

> ***Alternative 3 Mitigation Measure 7***: Install a traffic signal at the intersection of Arelious Walker/Gilman. Implementation of the new signal would be the responsibility of SFMTA, and should be implemented when traffic signal warrants are met. Since signalization was determined to be required even without the Project under 2030 No Project conditions, the Project Applicant shall contribute its fair-share toward the cost of improvements. Prior to payment of the contribution, the City shall create a mechanism to determine and receive fair share contributions from the Project Applicant. The SFMTA and DPW shall design and implement the measure as necessary. Since implementation of this mitigation measure is uncertain, traffic impacts would remain significant and unavoidable.

Alternative 4 – Lesser Build: Alternative 4 would be similar to the Project, but with less overall development in the project area. Impacts associated with Alternative 4 would be similar to or less than those identified for the Project.

Under Alternative 4 conditions, 37 of the 60 study intersections would operate at LOS E or LOS F conditions during the weekday AM or PM, or Sunday PM peak hours. At 8 of the 37 intersections Alternative 4 would result in project-specific impacts (i.e., project trips would cause intersections expected to operate at LOS D or better under 2030 No Project conditions to operate at LOS E or F, or intersections operating at LOS E under 2030 No Project conditions to deteriorate to LOS F conditions). At the remaining 29 of the 37 intersections that would operate at LOS E or LOS F, Alternative 4 contributions were determined to be less than significant at 16 intersections, and significant at 13 intersections (as identified in Table 48). Development associated with Alternative 4 would therefore result in impacts at 21 intersections (8 project-specific and 13 with significant contributions to LOS E or LOS F conditions).

No feasible mitigation measures have been identified for 21 of the 25 impacted intersections. The 21 intersections include:

1. Third/25th
2. Third/Cesar Chavez
3. Third/Cargo
4. Third/Evans
6. Third/Palou
7. Third/Revere
8. Third/Carroll
9. Third/Paul
11. Third/Jamestown
15. Cesar/Pennsylvania/I-280
18. Bayshore/Paul
21. Bayshore/Bacon
36. Bayshore/Cortland
38. Bayshore/Alemany/Industrial
39. Bayshore/U.S. 101 northbound off to Cesar
42. San Bruno/Paul
43.San Bruno/Silver
44.San Bruno/Mansell/U.S. 101 Southbound Off-ramp
56. Third/Williams/Van Dyke
59. Evans/Napoleon/Toland
57. Third/Jerrold

At the 21 intersections where feasible mitigation measures have not been identified, Alternative 4 impacts would remain *significant and unavoidable.*

Project Mitigation Measures 2, 3 and 5 would be applicable for the following four intersections:

26. Tunnel/Blanken
27. Geneva/U.S. 101 southbound ramps (existing Alana/Beatty)
28. Harney/U.S. 101 northbound ramps (existing Alana/Harney/Thomas Mellon)
49. Bayshore/Geneva

At the intersection of Tunnel/Blanken, with implementation of Project Mitigation Measure 2, operations would improve, but not to acceptable LOS D or better conditions in the AM and PM peak hours. Therefore, project-related impacts at Tunnel/Blanken would be *significant and unavoidable*.

Since implementation of Project Mitigation Measures 3 and 5 are uncertain, Project-related impacts at the four intersections of Geneva/U.S. 101 southbound ramps, Harney/U.S. 101

northbound ramps, and Bayshore/Geneva, traffic impacts would remain *significant and unavoidable*.

Alternative 5 – No Park Agreement: Alternative 5 would be the same as Project Variant 2, but with no bridge over Yosemite Slough. As discussed under Alternative 2, eliminating the bridge over Yosemite Slough may have a minor effect on mode choice, resulting in slightly higher auto trips compared to the same scenario with the bridge. However, the difference in the number of vehicle trips is expected to be negligible. The travel patterns would be the same with and without the bridge, since it would not be open to auto travel on non-game days. Therefore, impacts associated with Alternative 5 would be similar to those identified for Project Variant 2.

Under Alternative 5 conditions, 40 of the 60 study intersections would operate at LOS E or LOS F conditions during the weekday AM or PM, or Sunday PM peak hours. At 11 of the 40 intersections the Alternative 5 would result in project-specific impacts (i.e., project trips would cause intersections expected to operate at LOS D or better under 2030 No Project conditions to operate at LOS E or F, or intersections operating at LOS E under 2030 No Project conditions to deteriorate to LOS F conditions). At the remaining 29 of the 40 intersections that would operate at LOS E or LOS F, Alternative 5 contributions were determined to be less than significant at 8 intersections, and significant at 21 intersections (as identified in Table 48). Development associated with Alternative 5 would therefore result in impacts at 32 intersections (11 project-specific and 21 with significant contributions to LOS E or LOS F conditions).

Feasible mitigation measures were not identified for the following 27 of the 32 intersections that would be impacted by Alternative 5:

1. Third/25th
2. Third/Cesar Chavez
3. Third/Cargo
4. Third/Evans
5. Third/Oakdale
6. Third/Palou
7. Third/Revere
8. Third/Carroll
9. Third/Paul
11. Third/Jamestown
15. Cesar/Pennsylvania/I-280
16. Cesar/Evans
18. Bayshore/Paul
21. Bayshore/Bacon
24. Bayshore/Visitacion
25. Bayshore/Sunnydale
36. Bayshore/Cortland

37. Bayshore/Oakdale
38. Bayshore/Alemany/Industrial
39. Bayshore/U.S. 101 northbound off to Cesar
41. Bayshore/Blanken
42. San Bruno/Paul
43.San Bruno/Silver
44.San Bruno/Mansell/U.S. 101 Southbound Off-ramp
56. Third/Williams/Van Dyke
57. Third/Jerrold
58. Evans/Napoleon/Toland

At the 27 intersections where feasible mitigation measures have not been identified, Variant 2 impacts would remain *significant and unavoidable.*

Mitigation measures were identified for the following five intersections:

26. Tunnel/Blanken
27. Geneva/U.S. 101 Southbound Ramps (existing Alana/Beatty)
28. Harney/U.S. 101 Northbound Ramps (existing Alana/Harney/Thomas Mellon)
35. Amador/Cargo
49. Bayshore//Geneva

At these intersections, Project Mitigation Measures 2 through 5 would be applicable for Alternative 5. At the intersection of Tunnel/Blanken, with implementation of Project Mitigation Measure 2, operations would improve, but not to acceptable LOS D or better conditions in the AM and PM peak hours. Therefore, project-related impacts at Tunnel/Blanken would be *significant and unavoidable*.

Since implementation of Project Mitigation Measures 3 though 5 are uncertain, Project-related impacts at the four intersections of Geneva/U.S. 101 southbound ramps, Harney/U.S. 101 northbound ramps, Amador/Cargo/Illinois, and Bayshore/Geneva, traffic impacts would remain *significant and unavoidable*.

Freeway Operations

Tables 63 through 65 present the comparison of the mainline and weaving section LOS for Project Alternatives for the AM, PM, and Sunday peak hours, respectively. **Tables 66 through 68** present the comparison of the ramp junction analysis. **Tables 69 through 71** present a comparison of the ramp queuing analysis. Transportation Study Appendix G contains the freeway LOS analysis calculation sheets.

Table 63
Mainline and Weaving Segment LOS
Project Alternative Conditions - Weekday AM Peak Hour

Mainline Segment	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49es at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101										
NB - Cesar Chavez to Vermont	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB – Harney Way to Third/Bayshore	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB –Sierra Point to Harney Way	**E**	**40.5**	**E**	**44.0**	**E**	**40.4**	**E**	**43.6**	**E**	**43.9**
SB – I-80 Merge to Cesar Chavez	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – Third/Bayshore to Alana Way	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – Alana Way to Sierra Point	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
I-280										
NB – Alemany Off to Alemany On	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – Alemany On to Alemany Off	D	34.6	D	34.6	D	34.6	D	34.6	D	34.6
Weaving Segment	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**
I-280										
NB – 25th Street to Mariposa Street	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**
SB – Mariposa Street to 25th Street	**E**	**1,710**	**E**	**1,710**	**E**	**1,710**	**E**	**1,690**	**E**	**1,710**

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. For weaving sections service volume is reported as the measure of effectiveness. pc/h = passenger cars per hour
3. Segments operating at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

Table 64
Mainline and Weaving Segment LOS
Project Alternative Conditions - Weekday PM Peak Hour

Mainline Segment	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49es at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101										
NB - Cesar Chavez to Vermont	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB – Harney Way to Third/Bayshore	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB –Sierra Point to Harney Way	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – I-80 Merge to Cesar Chavez	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – Third/Bayshore to Alana Way	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB – Alana Way to Sierra Point	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
I-280										
NB – Alemany Off to Alemany On	D	33.3	D	33.3	D	33.3	D	33.3	D	33.3
SB – Alemany On to Alemany Off	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
Weaving Segment	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**
I-280										
NB – 25th Street to Mariposa Street	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**
SB – Mariposa Street to 25th Street	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**	**F**	**>1,900**

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. For weaving sections service volume is reported as the measure of effectiveness. pc/h = passenger cars per hour
3. Segments operating at LOS E or LOS F conditions highlighted in **bold**

Source: Fehr and Peers.

Table 65
Mainline and Weaving Segment LOS
Project Alternative Conditions - Sunday PM Peak Hour

Mainline Segment	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49es at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
U.S. 101										
NB - Cesar Chavez to Vermont	D	32.3	D	33.7	D	32.5	D	32.8	D	33.0
NB – Harney Way to Third/Bayshore	D	30.4	D	32.3	D	30.8	D	31.1	D	31.2
NB –Sierra Point to Harney Way	D	27.3	D	31.4	D	28.3	D	30.9	D	31.0
SB – I-80 Merge to Cesar Chavez	D	33.3	D	34.1	D	33.3	D	34.1	D	34.0
SB – Third/Bayshore to Alana Way	D	32.0	D	34.3	D	32.4	D	34.1	D	34.4
SB – Alana Way to Sierra Point	C	24.9	D	28.6	C	25.7	D	28.3	D	28.4
I-280										
NB – Alemany Off to Alemany On	C	21.6	C	21.6	C	21.6	C	21.6	C	21.6
SB – Alemany On to Alemany Off	D	29.5	D	29.5	D	29.5	D	29.5	D	29.5
Weaving Segment	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**	**LOS**	**Service Vol (pc/h)**
I-280										
NB – 25th Street to Mariposa Street	C	1,200	C	1,220	C	1,230	C	1,210	C	1,230
SB – Mariposa Street to 25th Street	C	1,310	C	1,300	C	1,300	C	1,280	C	1,320

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. For weaving sections service volume is reported as the measure of effectiveness. pc/h = passenger cars per hour
3. Segments operating at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

Table 66
Ramp Junction LOS
Project Alternative Conditions - Weekday AM Peak Hour

Ramp Location	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49es at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln	LOS	Density (pc/mi/ln)
U.S. 101										
NB on from Sierra Point Parkway	C	27.5	D	30.4	C	27.4	D	30.1	C	30.3
NB on from Harney Way[2]	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Bayshore	C	22.5	C	23.6	C	22.7	C	23.5	C	23.5
NB on from Alemany/Industrial	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Bayshore/Cesar	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB off to Bayshore/Cesar Chavez	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Cesar Chavez/Potrero	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Alemany/San Bruno	D	28.8	D	24.1	D	28.8	D	24.1	D	24.1
SB on from Third/Bayshore	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Harney/Geneva[2]	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Sierra Point/Lagoon	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
I-280										
NB off to Cesar Chavez	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Indiana/25th	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB off to Pennsylvania/25th	**E**	**37.0**	**E**	**36.9**	**E**	**36.8**	**E**	**36.8**	**E**	**36.9**
SB on from Pennsylvania/25th	**E**	**36.3**	**E**	**36.3**	**E**	**36.3**	**E**	**36.3**	**E**	**36.3**

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. Cumulative 2030 No Project conditions assume the reconstruction of the Harney Way interchange, as well as the extension of Geneva Avenue from Bayshore Boulevard east to the reconstructed interchange.
3. Ramp junctions at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

Table 67
Ramp Junction LOS
Project Alternative Conditions - Weekday PM Peak Hour

Ramp Location	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49es at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln	LOS	Density (pc/mi/ln)
U.S. 101										
NB on from Sierra Point Parkway	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Harney Way[2]	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Bayshore	C	27.9	D	30.0	D	28.1	C	29.8	D	30.0
NB on from Alemany/Industrial	**E**	**35.9**	**F**	**>45**	**E**	**36.0**	**F**	**>45**	**F**	**>45**
NB on from Bayshore/Cesar	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB off to Bayshore/Cesar Chavez	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Cesar Chavez/Potrero	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Alemany/San Bruno	D	29.6	D	32.6	D	29.9	D	32.3	D	32.7
SB on from Third/Bayshore	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Harney/Geneva[2]	D	31.9	**F**	**>45**	C	23.4	**F**	**>45**	**F**	**>45**
SB on from Sierra Point/Lagoon	C	22.7	D	28.5	C	23.4	C	27.3	D	28.5
I-280										
NB off to Cesar Chavez	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
NB on from Indiana/25th	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB off to Pennsylvania/25th	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Pennsylvania/25th	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. Cumulative 2030 No Project conditions assume the reconstruction of the Harney Way interchange, as well as the extension of Geneva Avenue from Bayshore Boulevard east to the reconstructed interchange.
3. Ramp junctions at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

Table 68
Ramp Junction LOS
Project Alternative Conditions - Sunday PM Peak Hour

Ramp Location	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49es at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density[1] (pc/mi/ln)	LOS	Density (pc/mi/ln	LOS	Density (pc/mi/ln)
U.S. 101										
NB on from Sierra Point Parkway	A	9.1	A	9.8	A	9.3	A	9.7	A	9.8
NB on from Harney Way[2]	D	33.0	**E**	**35.1**	D	33.2	D	33.5	D	33.5
NB on from Bayshore	C	21.9	C	22.4	C	21.9	C	21.9	C	21.9
NB on from Alemany/Industrial	C	24.6	C	25.6	C	24.6	C	24.6	C	24.6
NB on from Bayshore/Cesar	D	31.7	**F**	**>45**	D	32.1	D	32.7	D	33.2
SB off to Bayshore/Cesar Chavez	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Cesar Chavez/Potrero	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**	**F**	**>45**
SB on from Alemany/San Bruno	C	21.2	C	22.4	C	21.4	C	22.4	C	22.5
SB on from Third/Bayshore	C	23.9	C	26.0	C	24.4	C	25.7	C	25.9
SB on from Harney/Geneva[2]	C	24.8	D	29.8	C	25.7	D	29.4	C	29.5
SB on from Sierra Point/Lagoon	C	21.6	C	22.6	D	20.5	C	22.3	C	22.4
I-280										
NB off to Cesar Chavez	C	26.0	C	26.0	C	26.0	C	26.0	C	26.0
NB on from Indiana/25th	C	25.6	C	25.8	C	25.6	C	25.7	C	26.0
SB off to Pennsylvania/25th	D	30.7	D	30.9	D	31.1	D	30.9	D	31.1
SB on from Pennsylvania/25th	D	29.5	D	29.5	D	29.5	D	29.5	D	29.5

Notes:
1. Density of vehicles per segment. pc/mi/ln = passenger cars per mile per lane.
2. Cumulative 2030 No Project conditions assume the reconstruction of the Harney Way interchange, as well as the extension of Geneva Avenue from Bayshore Boulevard east to the reconstructed interchange.
3. Ramp junctions at LOS E or LOS F conditions highlighted in **bold**
Source: Fehr and Peers.

Table 69
Freeway Diverge Queue Storage
Project Alternative Conditions - Weekday AM Peak Hour

Ramp Location	Ramp Storage	Alternative 1 No Project	Alternative 2 No Bridge	Alternative 3 49es at Candlestick	Alternative 4 Lesser Build	Alternative 5 No Park Agreement
		95th % Queue[1]	95th % Queue	95th % Queue	95th % Queue	95th % Queue
U.S. 101						
NB off to Harney Way[2]	2,800	1,725	2,350	1,725	600	2,350
NB off to Bayshore/Cesar Chavez	750	**Spillback**	**Spillback**	**Spillback**	**Spillback**	**Spillback**
SB off to San Bruno/Silliman	600	175	175	175	175	175
SB off to San Bruno/Mansell	650	< 100	100	< 100	< 100	< 100
SB off to Bayshore/Hester	1,700	275	275	275	275	275
SB on from Harney/Geneva[2]	1,000	**Spillback**	**Spillback**	**Spillback**	**Spillback**	**Spillback**
SB off to Sierra Point/Lagoon	1,250	**Spillback**	**Spillback**	**Spillback**	**Spillback**	**Spillback**
I-280						
NB off to Cesar Chavez	2,500	**Spillback**	**Spillback**	**Spillback**	**Spillback**	**Spillback**
SB on from Pennsylvania/25th	900	< 100	< 100	< 100	< 100	< 100

Notes:
1. Ramps where there is potential for spillback are highlighted in **bold.**
2. 95th percentile queue is the length of queue that has a probability of 5 percent or less of being exceeded during the peak hour.
3. 2030 No Project conditions assume the reconstruction of the Harney Way Interchange as well as the connection of Geneva Avenue to the reconstructed interchange.
Source: Fehr & Peers.

Table 70
Freeway Diverge Queue Storage
Project Alternative Conditions - Weekday PM Peak Hour

Ramp Location	Ramp Storage (feet)	Alternative 1 No Project	Alternative 2 No Bridge	Alternative 3 49es at Candlestick	Alternative 4 Lesser Build	Alternative 5 No Park Agreement
		95th % Queue[1]	95th % Queue	95th % Queue	95th % Queue	95th % Queue
U.S. 101						
NB off to Harney Way[2]	2,800	**Spillback**	**Spillback**	**Spillback**	**Spillback**	**Spillback**
NB off to Bayshore/Cesar Chavez	750	525	525	525	525	525
SB off to San Bruno/Silliman	600	425	425	425	425	425
SB off to San Bruno/Mansell	650	350	350	325	350	350
SB off to Bayshore/Hester	1,700	125	125	125	125	125
SB on from Harney/Geneva[2]	1,000	**Spillback**	**Spillback**	**Spillback**	**Spillback**	**Spillback**
SB off to Sierra Point/Lagoon	1,250	1,000	1,000	1,000	1,000	1,000
I-280						
NB off to Cesar Chavez	2,500	900	900	900	900	900
SB off to Pennsylvania/25th	900	875	875	875	875	875

Notes:
1. Ramps where there is potential for spillback are highlighted in **bold.**
2. 95th percentile queue is the length of queue that has a probability of 5 percent or less of being exceeded during the peak hour.
3. 2030 No Project conditions assume the reconstruction of the Harney Way Interchange as well as the connection of Geneva Avenue to the reconstructed interchange.
Source: Fehr & Peers.

Table 71
Freeway Diverge Queue Storage
Project Alternative Conditions - Sunday PM Peak Hour

Ramp Location	Ramp Storage (feet)	Alternative 1 No Project	Alternative 2 No Bridge	Alternative 3 49es at Candlestick	Alternative 4 Lesser Build	Alternative 5 No Park Agreement
		95^{th} % Queue[1]	95^{th} % Queue	95^{th} % Queue	95^{th} % Queue	95^{th} % Queue
U.S. 101						
NB off to Harney Way[2]	2,800	1,450	**Spillback**	1,600	2,550	2,575
NB off to Bayshore/Cesar Chavez	750	350	350	350	350	350
SB off to San Bruno/Silliman	600	250	250	200	200	250
SB off to San Bruno/Mansell	650	< 100	100	< 100	100	100
SB off to Bayshore/Hester	1,700	300.0	325	300	325	325
SB on from Harney/Geneva[2]	1,000	**Spillback**	**Spillback**	**Spillback**	**Spillback**	**Spillback**
SB off to Sierra Point/Lagoon	1,250	125	125	125	125	125
I-280						
NB off to Cesar Chavez	2,500	825	825	825	825	825
SB on from Pennsylvania/25th	900	150	175	200	150	200

Notes:
1. Ramps where there is potential for spillback are highlighted in **bold.**
2. 95th percentile queue is the length of queue that has a probability of 5 percent or less of being exceeded during the peak hour.
3. 2030 No Project conditions assume the reconstruction of the Harney Way Interchange as well as the connection of Geneva Avenue to the reconstructed interchange.
Source: Fehr & Peers.

Project Alternative 1 is the 2030 No Project scenario, and was discussed in Chapter 5. Project Alternative 2 has the same travel demand and distribution characteristics as the Project and Project Alternative 5 has the same travel demand and distribution characteristics as Project Variant 2. Thus, discussion of these three Alternatives is not repeated in this section.

Project Alternatives 3 and 4 would generate fewer peak hour vehicle trips than the Project, and thus their contributions to study mainline and weaving segments and ramps would be less than for the Project.

Mainline and Weaving Segments

Project Alternatives 3 and 4 would generally contribute less traffic to the roadway system than the Project. A discussion of Project Alternatives 3 and 4 is included below.

Alternative 3 – 49ers at Candlestick: Traffic generated by Alternative 3 would create significant traffic impacts at the same locations as those identified for the Project. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway mainline segments expected to experience significant impacts under Project conditions. Therefore, the impacts associated with Alternative 3 are considered *significant and unavoidable*.

Alternative 4 – Lesser Build: Traffic generated by Alternative 4 would create significant traffic impacts at the same locations as those identified for the Project. However, Alternative 4 would also cause the freeway mainline segment on I-280 southbound between Mariposa Street and 25th Street to deteriorate from LOS E to LOS F in the AM peak hour, compared to the No Project. This would be an additional significant impact associated with Alternative 4, compared to the Project. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway mainline segments expected to experience significant impacts under Project conditions. Therefore, the impacts associated with Alternative 4 are considered *significant and unavoidable*.

Ramp Junctions

The freeway impacts analysis also examined merge/diverge levels of service and the potential for queues to extend from off-ramps onto freeway mainline segments for Alternatives 3 and 4.

Alternative 3 – 49ers at Candlestick: Traffic generated by Alternative 3 would create significant traffic impacts at the same locations as those identified for the Project, with four exceptions:

- The U.S. 101 northbound on-ramp from Alemany/Industrial was projected to deteriorate from LOS E in the PM peak hour under 2030 No Project conditions to LOS F with the Project. Under Alternative 3, the ramp merge section would continue to operate at LOS E in the PM peak hour.
- The U.S. 101 southbound on-ramp from Geneva Extension was projected to deteriorate from LOS D in the PM peak hour under 2030 No Project conditions to LOS F with the

Project. Under Alternative 3, the ramp merge section would operate at acceptable LOS C in the PM peak hour.

- The U.S. 101 northbound on-ramp from Harney Way was projected to deteriorate from LOS D in the Sunday peak hour under 2030 No Project conditions to LOS E with the Project. Under Alternative 3, this segment would remain at acceptable LOS D.
- The U.S. 101 northbound on-ramp from Bayshore/Cesar Chavez was projected to deteriorate from LOS D in the Sunday peak hour under 2030 No Project conditions to LOS F with the Project. Under Alternative 3, this segment would remain at acceptable LOS D.

Otherwise, significant traffic impacts associated with Alternative 3 would occur at the same locations as the Project, although the magnitude may be less due to less overall traffic generation associated with Alternative 3. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway mainline segments expected to experience significant impacts under Project conditions. Therefore, the impacts associated with Alternative 3 are considered *significant and unavoidable*.

Alternative 4 – Lesser Build: Traffic generated by Alternative 4 would create significant traffic impacts at the same locations as those identified for the Project, with two exceptions:

- The U.S. 101 northbound on-ramp from Harney Way was projected to deteriorate from LOS D in the Sunday peak hour under 2030 No Project conditions to LOS E with the Project. Under Alternative 3, this segment would remain at acceptable LOS D.
- The U.S. 101 northbound on-ramp from Bayshore/Cesar Chavez was projected to deteriorate from LOS D in the Sunday peak hour under 2030 No Project conditions to LOS F with the Project. Under Alternative 3, this segment would remain at acceptable LOS D.

Otherwise, significant traffic impacts associated with Alternative 4 would occur at the same locations as the Project, although the magnitude may be less due to less overall traffic generation associated with Alternative 4. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway mainline segments expected to experience significant impacts under Project conditions. Therefore, the impacts associated with Alternative 3 are considered *significant and unavoidable*.

The ramp analysis also examined the potential for queues at study off-ramps to extend back onto study freeway segments under conditions with Alternatives 3 and 4.

Alternative 3 – 49ers at Candlestick: Traffic generated by Alternative 3 would create significant traffic impacts associated with off-ramp queuing at the same locations as those identified for the Project, with one exception:

- Queues on the U.S. 101 northbound off-ramp to Harney Way were projected to extend back onto the adjacent freeway mainline segment during the Sunday peak hour under conditions with the Project. This would not occur under conditions with Alternative 3.

Otherwise, significant traffic impacts associated with Alternative 3 associated with off-ramp queuing would occur at the same locations as the Project, although the magnitude may be less due to less overall traffic generation associated with Alternative 3. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway off-ramps expected to experience significant queuing impacts under Project conditions. Therefore, the impacts associated with Alternative 3 are considered *significant and unavoidable*.

Alternative 4 – Lesser Build: Conditions under Alternative 4 would be similar to Alternative 3. Traffic generated by Alternative 4 would create significant traffic impacts associated with off-ramp queuing at the same locations as those identified for the Project, with one exception:

- Queues on the U.S. 101 northbound off-ramp to Harney Way were projected to extend back onto the adjacent freeway mainline segment during the Sunday peak hour under conditions with the Project. This would not occur under conditions with Alternative 4.

Otherwise, significant traffic impacts associated with Alternative 4 associated with off-ramp queuing would occur at the same locations as the Project, although the magnitude may be less due to less overall traffic generation associated with Alternative 4. As described in the discussion of Project impacts, no feasible mitigation measures have been identified for the freeway off-ramps expected to experience significant queuing impacts under Project conditions. Therefore, the impacts associated with Alternative 4 would be considered *significant and unavoidable*.

6.2 TRANSIT IMPACTS

The changes to the transit network that would be made as part of the ongoing TEP effort were described in section 4.3.2. The TEP operating improvements do not consider the needs of potential future development associated with the Project. As a result, the Project includes a series of transit service improvements in addition to those proposed by the TEP. Three routes would be extended into the proposed Hunters Point Transit Center: the 24-Divisadero, the 44-O'Shaughnessy, and the 48-Quintara-24th Street. Frequencies on the 24-Divisadero would increase from 7.5 minutes under the TEP operating scenario to 6 minutes in the AM and PM peak hours. Frequencies on the 44-O'Shaughnessey would remain at 6 minutes and frequencies on the 48-Quintara-24th Street would increase from 15 minutes to 10 minutes in the AM and PM peak hours. The Project would also extend the 29-Sunset from its current terminus near the Alice Griffith housing development, near Gilman Avenue and Giants Drive into the proposed Candlestick Point retail area, and increase its frequency by reducing headways between buses from 10 minutes to 5 minutes during the AM and PM peak hours. The T-Third service between Bayview and Chinatown via the Central Subway would convert from one-car to two-car trains, but headways would remain unchanged.

In addition, the 28L-19th Avenue Limited would be extended from its TEP-proposed terminus on Geneva Avenue, just east of Mission Street, into the Hunters Point Shipyard transit center. The 28L-19th Avenue Limited would travel along Geneva Avenue across U.S. 101 via the proposed Geneva Avenue extension and new interchange with U.S. 101, to Harney Way. East of Bayshore Boulevard, the 28L-19th Avenue Limited would operate as BRT, traveling in exclusive bus lanes into the Candlestick Point area. The BRT route would travel through the Candlestick Point retail corridor, and cross over Yosemite Slough into the Hunters Point Shipyard transit center. Frequencies on the 28L-19th Avenue Limited would be increased, and headways between buses would be reduced from 10 minutes to 5 minutes.

Funding for implementing the proposed TEP improvements is expected to be negligible because the TEP is designed to be budget-neutral. For the additional service proposed as part of the Project, the City and the Project Applicant have agreed to a Muni service plan that includes service hours, miles and vehicles associated, and have also agreed to execute an agreement which would determine a funding plan to provide the SFMTA the revenues necessary to support the Project. See Transportation Study Appendix K.

Table 72 compares the overall cordon capacity for Muni service for existing conditions, 2030 No Project (with TEP changes assumed to be in place), and the Project conditions for the three study area cordons (**see Figure 19**). Specifically, the Project would more than double overall east-west transit capacity at the cordon just east of Third Street (primarily due to the extension of the 28L-19th Avenue/Geneva Limited BRT route into Hunters Point Shipyard). North-south transit capacity to the north of the project site would double and capacity to the south of the project site would increase by over 80 percent over the transit service proposed by the TEP. Therefore, even though the Project would increase transit ridership on local transit service, the additional capacity provided by the project results in lower overall capacity utilization at the cordons with the Project compared to the 2030 No Project condition.

Table 72
Comparison of Capacity at Study Area Cordons [1, 2]
Existing, 2030 No Project and Project Conditions – Weekday AM and PM Peak Hours

Cordon	Existing Capacity	2030 No Project TEP Capacity [3]	Project Capacity [4]
East of Third Cordon	1,715	1,715	3,988
North Cordon	2,085	1,769	3,546
West Cordon	2,033	2,224	4,002

Notes:

1. Capacity presented in riders per hour. Inbound and Outbound Capacity the same – one direction of capacity presented.
2. Study Area Cordons presented on Figure 19.
3. Year 2030 No Project reflects implementation of TEP recommendations for lines serving the study area. 19-Polk will no longer serve the study area, but will be replaced by the 48-Quintara-24th Street, and the 56-Rutland will be eliminated.
4. Project conditions reflect TEP, plus the following improvements (see Figure 7):
   a. 24-Divisadero would be extended from its terminus at Third/Palou, along Palou Avenue and Crisp Avenue into the Hunters Point Shipyard Transit Center. Peak period headways would be reduced from 7.5 minutes under the TEP to 6 minutes
   b. The 28L would be extended from its proposed TEP terminus on Geneva Avenue, just east of Mission Street, along Geneva Avenue and Harney Way, across the proposed Yosemite Slough bridge, and into the Hunters Point Shipyard Transit Center. Peak period headways would be reduced from 10 minutes under the TEP to 5 minutes
   c. 29-Sunset would be extended from its current terminus at Gilman Avenue/Giants Drive into the Candlestick Point retail center. Headways would be reduced from 10 minutes under the TEP to 5 minutes.
   d. 44-O'Shaughnessey would be rerouted from its current route terminating at Evans/Mendell into the Hunters Point Transit Center. Headways would remain at 6 minutes, similar to the TEP scenario.
   e. 48-Quintara-24th Street would be rerouted from its current terminus near 22nd/Third to serve the project study area as part of the TEP (replacing the 19-Polk, which would no longer serve the Shipyard site). With the Project, this route would be extended to the Hunters Point Transit Center and headways would decrease from 15 minutes under the TEP to 10 minutes.
   f. CPX-Candlestick Express to downtown would be a new express bus route serving the Candlestick Point site, traveling along Harney Way (with potential stops at Executive Park), before traveling on U.S. 101 toward downtown, terminating at the Transbay Terminal.
   g. HPX- Hunters Point Shipyard Express to downtown would be a new express bus route serving the Hunters Point Shipyard site, traveling from the Hunters Point Shipyard Transit Center, along Innes Street, with stops at the India Basin and Hunters View areas, before continuing along Evans Avenue to Third Street, eventually entering I-280 northbound at 25th/Indiana. The HPX would continue non-stop to the Transbay Terminal in Downtown San Francisco.
   h. T-Third service between Bayview and Chinatown via the Central Subway would convert from one-car to two-car trains, but headways would remain unchanged. The two-car short-line operating between Chinatown and Mariposa Street would remain unchanged.

Source: SFMTA, Fehr & Peers.

6.2.1 Project and Project Variants

This section describes the impacts to transit associated with the Project and Project Variants. For project impacts, two transit analyses were conducted: the impact of the additional transit travel demand generated by the Project on the capacity utilization of the study area cordons, the downtown Muni screenlines, and the regional screenlines; and the impact of the additional vehicle and transit travel demand on transit travel times for the Muni routes traveling within the study area.

Overview

The Project would include substantial improvements to transit service in the Hunters Point Shipyard, Candlestick Point, and Bayview neighborhoods, in addition to improvements currently proposed as part of SFMTA's Transit Effectiveness Program. As discussed below, the Project improvements to transit service, combined with existing service and proposed TEP improvements, would provide transit capacity to accommodate the new transit riders generated by the Project and by cumulative development.

Although the Project Description includes a plan for increased transit service to the study area (described in the Project Description), because the final Transit Plan has not been formally approved by SFMTA, **Project Mitigation Measure 7** is required to ensure the final Transit Plan will be prepared and implemented. Thus, mitigation measure **Project Mitigation Measure 7** below requires preparation, approval, and implementation of the final transit-operating plan.

> ***Project Mitigation Measure 7***: The Project Applicant shall work with SFMTA to develop and implement the Project's Transit Operating Plan. Elements of the Project Transit Operating Plan shall include:
>
> - Extension of the 24-Divisadero, the 44-O'Shaughnessy, and the 48-Quintara-24th Street into Hunters Point Shipyard.
> - Increased frequency on the 24-Divisadero to 6 minutes in the AM and PM peak periods. Extension of the 29-Sunset from its current terminus near the Alice Griffith housing development, near Gilman Avenue and Giants Drive, into the proposed Candlestick Point retail area. The 29-Sunset would operate a short line between Candlestick Point and the Balboa Park BART station. This would increase frequencies on the 29-Sunset by reducing headways between buses from 10 minutes to 5 minutes during the AM and PM peak periods between Candlestick Point and the Balboa BART station. Every other bus would continue to serve the Sunset District (to the proposed terminus at Lincoln Drive and Pershing Drive in the Presidio) at 10-minute headways.
> - Convert T-Third service between Bayview and Chinatown via the Central Subway from one-car to two-car trains or comparable service improvement.

- Extension of the 28L-19th Avenue Limited from its TEP-proposed terminus on Geneva Avenue, just east of Mission Street, into the Hunters Point Shipyard transit center. The 28L-19th Avenue Limited would travel along Geneva Avenue across U.S. 101 via the proposed Geneva Avenue extension and new interchange with U.S. 101, to Harney Way. East of Bayshore Boulevard, the 28L-19th Avenue Limited would operate as BRT, traveling in exclusive bus lanes into the Candlestick Point area. The BRT route would travel through the Candlestick Point retail corridor, and cross over Yosemite Slough into the Hunters Point Shipyard transit center.
- The 28L-19th Avenue Limited would operate a short line to the Balboa Park BART station. This would increase frequencies on the 28L-19th Avenue Limited by reducing headways between buses from 10 minutes to 5 minutes for the segment between Hunters Point Shipyard and the Balboa Park BART station. Every other bus would continue to the Sunset District (to the proposed terminus at North Point Street and Van Ness Avenue) at 10-minute headways. If the TEP-proposed extension of the 28L has not been implemented by the SFMTA by the Phase 2 of Project development, the Project Applicant shall fund the extension of that line between its existing terminus and Bayshore Boulevard.
- New CPX-Candlestick Express to downtown serving the Candlestick Point site, traveling along Harney Way (with potential stops at Executive Park), before traveling on U.S. 101 toward downtown, terminating at the Transbay Terminal.
- New HPX-Hunters Point Shipyard Express to downtown serving the Hunters Point Shipyard site, traveling from the Hunters Point Shipyard Transit Center, along Innes Avenue, with stops at the India Basin and Hunters View areas, before continuing along Evans Avenue to Third Street, eventually entering I-280 northbound at 25th/Indiana. The HPX would continue non-stop to the Transbay Terminal in Downtown San Francisco.

Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources. With implementation of the Transit Plan, Project-generated transit trips would be accommodated within the existing and proposed transit capacity, and therefore Project impacts on transit capacity would be *less than significant.*

Transit Capacity Utilization

Table 73 summarizes the capacity utilization for each of the three cordons for the AM and PM peak hours for the Project conditions, and for Project Variants 1 and 2. With the transit capacity increases proposed by the Project, the total transit travel demand on Muni under Project conditions could be accommodated for each of the three cordons during the AM and PM peak hours. All three cordons would operate at less than Muni's 85 percent capacity utilization standards.

Table 73
Ridership and Capacity Utilization at Study Area Cordons
Project and Project Variants – Weekday AM and PM Peak Hours

Peak Hour/Cordon	Project		Variant 1 (R&D)		Variant 2 (Housing)	
	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.
AM Peak Hour						
East of Third Cordon						
Inbound	2,548	64%	2,585	65%	2,512	63%
Outbound	1,541	39%	1,841	46%	1,511	38%
North Cordon						
Inbound	2,458	69%	2,490	70%	2,457	69%
Outbound	2,151	61%	2,257	64%	2,145	60%
West Cordon						
Inbound	3,164	79%	3,108	78%	3,057	76%
Outbound	1,870	47%	2,073	52%	1,863	47%
PM Peak Hour						
East of Third Cordon						
Inbound	2,002	50%	2,280	57%	2,014	50%
Outbound	2,092	52%	2,214	56%	2,151	54%
North Cordon						
Inbound	2,675	75%	2,889	81%	2,664	75%
Outbound	2,231	63%	2,299	65%	2,237	63%
West Cordon						
Inbound	1,938	48%	2,076	52%	1,922	48%
Outbound	2,374	59%	2,442	61%	2,403	60%

Source: Fehr & Peers.

If Project-related transit capacity improvements are not provided, then only the capacity presented in **Table 72** for the 2030 No Project conditions would be available to accommodate Project and cumulative transit ridership. As indicated in **Table 42**, under 2030 No Project conditions, the capacity utilization at the study area cordons is projected to exceed Muni's 85 percent capacity utilization standard. With the addition of Project-generated transit trips, the severity of the standard exceedance would increase, and would result in significant impacts. Because the final transit plan has not been formally approved by SFMTA, Project Mitigation Measure 7 is required to ensure the final Transit Plan will be prepared and implemented.

With implementation of Project Mitigation Measure 7, the Project's impacts and the Project's contribution to cumulative impacts on transit capacity at the study area cordons would be *less than significant*.

Table 74 summarizes the capacity utilization for the downtown screenlines for the AM and PM peak hours for the Project conditions, and for Project Variants 1 and 2. As summarized in Table 72, the project would only add peak-direction riders through the southeast downtown screenline. Ridership on other screenlines would remain unchanged. With the addition of project trips, all downtown screenlines would continue to operate with Muni's 85 percent utilization standard. Therefore, Project impact on transit capacity at the Downtown Screenlines would be *less than significant.*

Table 74
Ridership and Capacity Utilization at Downtown Screenlines
Project and Project Variants – Weekday AM and PM Peak Hours

Peak Hour/Screenline	Project		Variant 1 (R&D)		Variant 2 (Housing)	
	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.
AM Peak Hour						
Northeast	3,008	78%	3,008	78%	3,008	78%
Northwest	8,949	75%	8,949	75%	8,949	75%
Southeast	7,536	74%	7,573	74%	7,553	74%
Southwest	7,674	76%	7,674	76%	7,674	76%
Total All Screenlines	27,167	75%	27,167	75%	27,167	75%
PM Peak Hour						
Northeast	3,140	78%	3,140	78%	3,140	78%
Northwest	8,155	75%	8,155	75%	8,155	75%
Southeast	8,223	83%	8,306	84%	8,263	83%
Southwest	8,829	82%	8,829	82%	8,829	82%
Total All Screenlines	28,347	80%	28,347	80%	28,347	80%

Source: Fehr & Peers.

Table 75 summarizes the capacity utilization for the regional transit provider screenlines for the AM and PM peak hours for the Project conditions, and for Project Variants 1 and 2. The Project and Project Variants 1 and 2 would each contribute relatively small ridership increases to regional transit compared to 2030 No Project conditions. Regional cordons would operate at the same percentage of capacity utilization with the Project and Project Variants 1 and 2 as under 2030 No Project conditions, with one exception. The capacity utilization for the South Bay would increase from 69 to 70 percent during the PM peak hour with the Project and Variants 1 and 2, compared to the 2030 No Project scenario. The Project and Variants 1 and 2 would contribute slightly fewer trips to the South Bay cordon in the off-peak directions (southbound in the AM peak hour and northbound in the PM peak hour) than in the peak directions. Off-peak direction ridership would remain within available capacity in the AM and PM peak hours.

Overall, the Project would not increase the capacity utilization by more than one percentage point on any cordon or screenline expected to exceed available capacity without the Project. Further, the increase in Project transit trips would not result in any cordon or screenline expected to operate within available capacity without the Project to exceed its capacity. Project contributions to regional transit providers operating at more than 100 percent capacity utilization (e.g., BART to East Bay, Golden Gate Transit to North Bay) would be minimal, about 0.1 percent. Therefore, the Project and Project Variant's impacts on transit capacity would be *less than significant*.

Table 75
Project Transit Trips and Capacity Utilization at Regional Screenlines
Project and Project Variants – Weekday AM and PM Peak Hours

Peak Hour/Screenline	Project		Variant 1 (R&D)		Variant 2 (Housing)	
	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.
AM Peak Hour						
East Bay						
BART	36,202	185%	36,221	185%	36,200	185%
AC Transit	3,347	61%	3,347	61%	3,347	61%
Ferries	1,971	83%	1,971	83%	1,971	83%
subtotal	*41,520*	*151%*	*41,539*	*151%*	*41,518*	*151%*
North Bay						
Golden Gate Transit	2,621	106%	2,621	106%	2,621	106%
Ferries	1,647	97%	1,647	97%	1,647	97%
subtotal	*4,268*	*102%*	*4,268*	*102%*	*4,268*	*102%*
South Bay						
BART	12,416	89%	12,456	90%	12,413	89%
Caltrain	4,451	70%	4,474	70%	4,449	69%
SamTrans	799	75%	812	76%	798	75%
Ferries	152	51%	152	51%	152	51%
subtotal	*17,818*	*82%*	*17,893*	*82%*	*17,812*	*82%*
Total All Screenlines	***63,606***	***119%***	***63,700***	***119%***	***63,598***	***119%***
PM Peak Hour						
East Bay						
BART	30,268	154%	30,275	154%	30,268	154%
AC Transit	4,485	68%	4,485	68%	4,485	68%
Ferries	2,147	79%	2,147	79%	2,147	79%
subtotal	*36,900*	*128%*	*36,907*	*128%*	*36,900*	*128%*
North Bay						
Golden Gate Transit	2,513	114%	2,513	114%	2,513	114%
Ferries	1,630	96%	1,630	96%	1,630	96%
subtotal	*4,143*	*106%*	*4,143*	*106%*	*4,143*	*106%*
South Bay						
BART	10,707	76%	10,720	77%	10,708	76%
Caltrain	4,008	63%	4,017	63%	4,013	63%
SamTrans	404	43%	408	43%	408	43%
Ferries	75	25%	75	25%	75	25%
subtotal	*15,194*	***70%***	*15,219*	***70%***	*15,204*	***70%***
Total All Screenlines	***56,237***	***103%***	***56,269***	***103%***	***56,247***	***103%***

Source: Fehr & Peers.

Project Transit Delay

Impacts to transit were also measured in terms of increases to transit travel times. The analysis evaluated the increases to transit travel times associated with the following three influencing factors[19]:

- **Traffic congestion delay** – Traffic congestion associated with increases in area traffic slows down transit vehicles and results in increased transit travel times. Traffic congestion delays are calculated by summing the average vehicular delay at each intersection along the transit line's route within the study area. The increase in total route segment delay is equal to the increase in travel time associated with the project.
- **Transit re-entry delay** – Transit vehicles typically experience delays after stopping to pick up and drop off passengers while waiting for gaps in adjacent street traffic in order to pull out of bus stops. As traffic volumes on the adjacent street increase, re-entering the flow of traffic becomes more difficult and transit vehicles experience increased delay. Transit re-entry delay was calculated using empirical data presented in the 2000 Highway Capacity Manual (HCM). Total transit re-entry delay for each route was calculated as the sum of transit re-entry delay at each stop within the study area.
- **Passenger boarding delay** – Although increases in transit ridership are generally viewed positively, the amount of time a transit vehicle has to stop to pick up and drop off passengers (i.e., the transit vehicle dwell time) is directly correlated to the number of passengers boarding the vehicle. If, as proposed, the project includes substantial improvements to transit service in the future (and as general transit ridership grows), vehicles would have to spend more time at stops, which may increase overall transit travel times. Passenger boarding delay was calculated assuming two seconds per passenger boarding for buses, and 0.5 seconds per passenger boarding for light rail vehicles. Passenger boardings within the study area were estimated by examining the increases in ridership across the study area cordons.

Although the transit routes in the study area would not be extended into the study area under existing conditions or under 2030 No Project conditions, transit delay for those scenarios was calculated as if the transit routes were extended only for purposes of comparing project impacts. Generally, the increases in travel times associated with the project are somewhat smaller than those associated with the increases expected between existing and 2030 No Project conditions.

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[19] The methodology used is similar to that used in the *San Francisco Bicycle Plan Draft EIR*, City of San Francisco Planning Department, November 2008, except that methodology included the additional transit delay associated with substantial increases in bicycle volumes, which was appropriate for a project contemplating large-scale changes to the City's bicycle network. Bicycle volumes are not expected to substantially change as part of this project, so the "bicycle delay" was not included. However, instead, this evaluation includes the added delay associated with increases in passenger boardings, which is more appropriate for this project since the project includes major improvements to area transit service. A more detailed discussion of the methodology is included in Appendix H.

A detailed discussion of how each of these three delay components was calculated is included in Transportation Study Appendix H. **Table 76** summarizes the increases in transit travel times associated with the Project and the Project Variants for each route within the study area, compared to 2030 No Project conditions. A detailed breakdown of the calculations of increased delay associated with the Project is provided in Transportation Study Appendix H. **Table 77** identifies the number of additional vehicles that would be required to meet the proposed headways.

The Project would have a significant impact if it would increase travel times such that additional vehicles would be required to maintain the proposed headways. This was assumed to be the case if either the project's travel time increases to a particular route would be greater than ½ its proposed headway or if the number of required vehicles estimated using SFMTA's cost/scheduling model, which takes into account scheduled breaks and extra time built into schedules, increases by one or more vehicles with the addition of the project characteristics.

Table 78 presents the summary table of project transit impacts for Project, Project Variants, and Alternatives to the Project. On **Table 78**, Project impacts (PI) were identified where the Project would result in an increase in ridership that would result in an exceedance of the capacity utilization standard, or an increase in transit delay such that additional transit vehicles would be required to maintain proposed headways**.** In addition, Project impacts were identified where the Project would contribute significantly to poor intersection operations that, therefore, would contribute to significantly to transit delays that would result in the need for additional transit vehicles to maintain proposed headways, and noted as Significant Contribution/Project Impact (SC/PI). Where the Project would *not* contribute significantly to transit ridership at locations where capacity utilization under 2030 No Project condition exceeds capacity utilization standards, or if the Project would not contribute significantly to poor intersection operations that would affect transit operations, this was noted as No Significant Contribution (NSC).

Where projected ridership under the 2030 No Project condition would result in an exceedance of the capacity utilization standard, or where traffic congestion associated with background traffic growth would result in a need for additional transit vehicles to maintain existing or TEP-proposed headways, this was identified as a No Project Impact (NP Impact).

Table 76
Project Increases to Transit Travel Time (minutes:seconds)[1, 2]
Project and Project Variants – Weekday AM and PM Peak Hours

Route	Proposed Headway (min.)	Northbound/Eastbound			Southbound/Westbound		
		Project	Variant 1 (R&D)	Variant 2 (Housing)	Project	Variant 1 (R&D)	Variant 2 (Housing)
AM Peak Hour							
9-San Bruno	10	**1:09**	**1:07**	**1:19**	**8:04**	**8:42**	**8:09**
23-Monterey	15	0:41	0:41	0:38	3:51	3:51	3:51
24-Divisadero	6	**5:34**	**11:48**	**9:50**	**2:44**	**-0:13**	**-0:49**
28L-19th Ave Ltd	5	**3:36**	**3:36**	**3:36**	**1:01**	**0:39**	**0:39**
29-Sunset	10	**4:39**	**7:06**	**6:15**	**9:55**	**9:27**	**8:28**
44-O'Shaughnessy	6	**5:53**	**8:24**	**5:54**	**6:16**	**7:53**	**6:14**
48-Quintara-24th St	15	**2:00**	**7:40**	**3:06**	**2:20**	**7:11**	**6:39**
54-Felton [3]	20	0:56	3:23	1:39	-0:17	-3:10	-3:00
T-Third	8	1:34	1:42	1:35	1:39	1:39	1:39
PM Peak Hour							
9-San Bruno	10	**4:03**	**4:19**	**3:55**	**6:49**	**6:56**	**6:49**
23-Monterey	15	0:56	0:58	0:58	1:57	2:01	1:57
24-Divisadero	6	**6:45**	**6:10**	**5:32**	**9:49**	**10:00**	**8:24**
28L-19th Ave Ltd	5	**2:59**	**2:59**	**2:59**	0:03	0:03	0:03
29-Sunset	10	**16:00**	**15:10**	**15:35**	**16:32**	**17:05**	**16:18**
44-O'Shaughnessy	6	**6:05**	**12:30**	**6:56**	**7:18**	**10:06**	**8:02**
48-Quintara-24th St	15	2:51	**9:08**	**7:21**	3:00	**9:03**	**5:26**
54-Felton [3]	20	**3:48**	**5:44**	**4:09**	**5:32**	**3:45**	**3:13**
T-Third	8	**2:57**	**3:35**	**2:50**	**2:33**	**2:45**	**2:32**

Notes:
1. Delays measured for each route between project site and key destination/transfer point away from the project. The study segment for each route is as follows:
- 9-San Bruno: Bayshore Boulevard between Sunnydale Avenue and Jerrold Avenue
- 23-Monterey: between Ingalls Street/Oakdale Avenue and the Glen Park BART Station
- 24-Divisadero: between Hunters Point Shipyard and Mission Street
- 28L-19th Avenue Limited: between Hunters Point Shipyard and Mission Street
- 29-Sunset: between Candlestick Point and Mission Street
- 44-O'Shaughnessy: between Hunters Point Shipyard and the Glen Park BART Station
- 48-Quintara-24th St: between Hunters Point Shipyard and the 24th Street BART Station
- 54-Felton: between Jerrold Avenue/Earl Street and Mission Street
- T-Third: Third Street between Thomas Avenue and Jerrold Avenue (This segment represents the section of the T-Third route that does not provide exclusive right-of-way for transit and would be most affected by increased traffic congestion.)

2. Routes where the Project would increase travel times such that additional vehicles would be required highlighted in **bold**.
3. Due to roadway improvements proposed by the Project and differences between the No Project and Project land use assumptions at the Hunters Point Shipyard, there would be less traffic congestion along 54-Felton route in study area with the Project, than under 2030 No Project conditions.
Source: Fehr & Peers.

Table 77
Additional Muni Transit Vehicle Requirements
Project and Project Variants – Weekday AM and PM Peak Hours

Route	Project	Variant 1 (R&D)	Variant 2 (Housing)
AM Peak Hour			
9-San Bruno	**1**	**1**	**1**
23-Monterey	0	0	0
24-Divisadero	**1**	**2**	**2**
28L-19th Ave Ltd	**1**	**1**	**1**
29-Sunset	**1**	**2**	**1**
44-O'Shaughnessy	**2**	**3**	**2**
48-Quintara-24th Street	**1**	**1**	**1**
54-Felton [2]	0	0	0
T-Third	0	0	0
Total	*7*	***10***	***8***
PM Peak Hour			
9-San Bruno	**1**	**1**	**1**
23-Monterey	0	0	0
24-Divisadero	**3**	**3**	**2**
28L-19th Ave Ltd	**1**	**1**	**1**
29-Sunset	**3**	**3**	**3**
44-O'Shaughnessy	**2**	**4**	**2**
48-Quintara-24th Street	0	**1**	**1**
54-Felton	**1**	**1**	**1**
T-Third	**1**	**1**	**1**
Total	***12***	***15***	***12***

Note:
Transit vehicle requirements for Project and Project Variants are in addition to those required for the 2030 No Project condition (Alternative 1) identified in Table 80.
Source: Fehr & Peers.

Table 78
Summary of Transit Impacts – Capacity Utilization and Transit Operations

Intersection	Project	P-Var 1 (R&D)	P-Var 2 (Housing)	Alt 1 No Project	Alt 2 No Bridge	Alt. 3 49ers at Stick	Alt 4 Lesser Build	Alt 5 No Park Agree
Capacity Utilization Analyses								
Cordons								
North	--	--	--	NPI	--	--	--	--
West	--	--	--	NPI	--	--	--	--
East of Third	--	--	--	NPI	--	--	--	--
Downtown Screenlines								
Northeast	NSC	NSC	NSC	--	NSC	NSC	NSC	NSC
Northwest	NSC	NSC	NSC	--	NSC	NSC	NSC	NSC
Southeast	NSC	NSC	NSC	--	NSC	NSC	NSC	NSC
Southwest	NSC	NSC	NSC	--	NSC	NSC	NSC	NSC
Regional Screenlines								
East Bay	NSC	NSC	NSC	--	NSC	NSC	NSC	NSC
North Bay	NSC	NSC	NSC	--	NSC	NSC	NSC	NSC
South Bay	NSC	NSC	NSC	--	NSC	NSC	NSC	NSC

Notes:
1. PI – Project Impact. Project results in an increase in ridership that would result in an exceedance of the capacity utilization standard, or an increase in transit delay such that additional transit vehicles would be required to maintain proposed headways.
2. NSC – No Significant Contribution. Project would not contribute significantly to transit ridership at locations where capacity utilization under 2030 No Project condition exceeds capacity utilization standards. Or if Project would not contribute significantly to poor intersection operations that would affect transit operations. No impacts.
3. SC/PI – Significant Contribution/Project Impact. Project would contribute significantly to poor intersection operations that, therefore, would contribute to significantly to transit delays that would result in the need for additional transit vehicles to maintain proposed headways.
4. NPI – No Project Impact. Projected ridership under 2030 No Project conditions would result in an exceedance of the capacity utilization standard. Or traffic congestion associated with background traffic growth would result in a need for additional transit vehicles to maintain existing or TEP-proposed headways.
Source: Fehr & Peers.

Table 78 (continued)
Summary of Transit Impacts – Capacity Utilization and Transit Operations

Intersection	Project	P-Var 1 (R&D)	P-Var 2 (Housing)	Alt 1 No Project	Alt 2 No Bridge	Alt. 3 49ers at Stick	Alt 4 Lesser Build	Alt 5 No Park Agree
Transit Operations Analyses								
9-San Bruno	PI	PI	PI	NPI	PI	SC/PI	PI	PI
23-Monterey	SC/PI	SC/PI	SC/PI	NPI	SC/PI	SC/PI	SC/PI	SC/PI
24-Divisadero	PI	PI	PI	NPI	PI	PI	PI	PI
28L-Geneva Limited	PI	PI	PI	NPI	PI	PI	SC/PI	PI
29-Sunset	PI	PI	PI	NPI	PI	--	PI	PI
44-O'Shaughnessy	PI	PI	PI	NPI	PI	PI	PI	PI
48-Quintara-24th Street	PI	PI	PI	NPI	PI	PI	PI	PI
54-Felton	PI	PI	PI	NPI	PI	PI	PI	PI
T-Third	PI	PI	PI	NPI	PI	PI	PI	PI

Notes:
1. PI – Project Impact. Project results in an increase in ridership that would result in an exceedance of the capacity utilization standard, or an increase in transit delay such that additional transit vehicles would be required to maintain proposed headways.
2. NSC – No Significant Contribution. Project would not contribute significantly to transit ridership at locations where capacity utilization under 2030 No Project condition exceeds capacity utilization standards. Or if Project would not contribute significantly to poor intersection operations that would affect transit operations. No impacts.
3. SC/PI – Significant Contribution/Project Impact. Project would contribute significantly to poor intersection operations that, therefore, would contribute to significantly to transit delays that would result in the need for additional transit vehicles to maintain proposed headways.
4. NPI – No Project Impact. Projected ridership under 2030 No Project conditions would result in an exceedance of the capacity utilization standard. Or traffic congestion associated with background traffic growth would result in a need for additional transit vehicles to maintain existing or TEP-proposed headways.
Source: Fehr & Peers.

As shown on **Table 77**, the addition of Project traffic and ridership demands would create the need for additional vehicles on five routes in the AM peak hour and six routes in the PM peak hour.

- In the AM peak hour, the Project travel demand would require 7 additional transit vehicles for the 9-San Bruno (1 vehicle), 24-Divisadero (1 vehicle), 28L-19th Avenue Limited (1 vehicle), 29-Sunset (1 vehicle), 44-O'Shaughnessy (2 vehicles), and the 48-Quintara-24th Street (1 vehicle) routes. These would be in addition to the 16 vehicles required to maintain 2030 No Project headways (see Table 83).

- In the PM peak hour, the Project would result in the need for 12 additional transit vehicles for the 9-San Bruno (1 vehicle), 24-Divisadero (3 vehicles), 28L-19th Avenue Limited (1 vehicle), 29-Sunset (3 vehicles), 44-O'Shaughnessy (2 vehicles), the 54-Felton (1 vehicle), and the T-Third (1 train car) routes. These would be in addition to the 16 required to maintain 2030 No Project headways.

This would be a significant impact. Although the Project would increase congestion in the overall study area, the traffic analysis indicates that the impacts to transit would be greatest at key bottleneck locations where there is substantial cross-traffic, specifically routes that cross Third Street. Discussion of impacts is presented by line and corridor.

9-San Bruno - Project-related transit delays due to congestion on study area roadways and passenger loading delays associated with increased ridership would result in significant impacts on the operation of the 9-San Bruno. Within the study area, the 9-San Bruno would experience substantial delays at key intersections along San Bruno Avenue, including at Silver Avenue, Silliman Avenue, Paul Avenue/Dwight Street, and at Mansell Street. Overall, the Project-related congestion would add up to 8 minutes of delay per bus during peak hours. The provision of transit-only lanes on San Bruno Avenue, and other transit-priority treatments would reduce travel time delays and impacts on this line.

> **Project Mitigation Measure 8.1:** To address Project impacts to the 9-San Bruno, prior to issuance of a grading permit for Phase 1, the Project Applicant in cooperation with SFMTA shall conduct a study to evaluate the effectiveness and feasibility of the following improvements which could reduce Project impacts on transit operations along the San Bruno Avenue corridor, generally between Campbell Avenue and Silver Avenue. The study shall create a monitoring program to determine the implementation extent and schedule (as identified below) to maintain the proposed headways of the 9-San Bruno.
>
> - Install a transit-only lane on northbound San Bruno Avenue for the one-block section (400 feet) between Silliman Street and Silver Avenue. This would involve removal of five metered spaces on the east side of San Bruno Avenue, just south of Silver Avenue. Treatment for transit-only lanes can range from

striping to physical elevation changes or barriers to protect transit right-of-way from mixed-flow traffic.

- Install a transit-only lane on southbound San Bruno Avenue at the approach to Dwight Street/Paul Avenue. This lane would function as a so-called "queue-jump" lane, allowing buses to bypass queues on southbound San Bruno Avenue at the intersection. The lane should begin approximately 200 feet north of Dwight Street and extend one block (about 300 feet) south of Paul Avenue to Olmstead Street. This would involve the removal of up to 20 on-street parking spaces on the west side of San Bruno Avenue. This treatment could be limited to peak hours only, which would minimize the impact of the parking loss. The segment of San Bruno Avenue between Dwight Street and Olmstead Street is designated as Bicycle Routes #705 and 5 (Class III signed routes).

- At the intersection of San Bruno/Silver install signal priority treatments on westbound Silver Avenue, where buses waiting to turn left from Silver Avenue onto southbound San Bruno Avenue must currently wait through almost an entire signal cycle due to the heavy oncoming traffic on eastbound Silver Avenue. Installation of a transit signal pre-emption at this location that provides a "green" signal for westbound vehicles but holds eastbound vehicles when buses are present would allow transit vehicles to turn left onto San Bruno Avenue without having to wait for opposing eastbound through traffic to clear.

The Project Applicant shall fully fund the costs of implementing the transit priority improvements (either the improvements identified above, or alternative improvements of equal or greater effectiveness and comparable cost) as determined by the study and the monitoring program. Other options to be evaluated in the study could include comprehensive replacement of stop-controlled intersections with interconnected traffic signals equipped with transit priority elements.

Project Mitigation Measure 8.2 - Should Project Mitigation Measure 8.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the 9-San Bruno. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

The three treatments contained in Project Mitigation Measure 8.1 combined could reduce AM peak hour travel times by 4 minutes and 6 seconds in the northbound direction, and 6 minutes 18 seconds in the southbound direction. During the PM peak hour, these treatments could reduce PM peak hour travel times by 4 minutes 6 seconds in the northbound direction and by 8 minutes in the southbound direction. With the combination of mitigation measures, transit travel times in each direction and during each peak period would be no greater than for 2030 No Project conditions. However, because 2030 No Project conditions constitute adverse delays to transit service, cumulative adverse delays to transit service would occur even with these Project transit mitigation measures. Because adverse transit delays affecting this line are generated by adverse traffic congestion to which the Project has a considerable contribution, the Project also has a cumulatively considerable contribution to adverse transit delays.

Implementation of Project Mitigation Measure 8.2, on the other hand, would allow operation of headways as described in Project Mitigation Measure 7. However, given the congestion along the San Bruno Avenue corridor, implementation of Project Mitigation Measure 8.2 alone, without Project Mitigation Measure 8.1, might not be sufficient to reduce the impact to less than significant levels.

Implementation of **Project Mitigation Measure 8.1** would exacerbate LOS F conditions at the intersections of San Bruno/Silver, San Bruno/Silliman/U.S. 101 Southbound off-ramp, and San Bruno/Paul that were identified as having significant and unavoidable impacts. Additional impacts of these mitigation measures would be similar to Project impacts addressed in this section regarding traffic circulation, parking supply, loading supply and operations, and bicycle circulation.

Because a feasibility study of the improvements contemplated in mitigation measure **Project Mitigation Measure 8.1** would be required, implementation of **Project Mitigation Measure 8.1** is uncertain. Because implementation of **Project Mitigation Measure 8.2** alone, without **Project Mitigation Measure 8.1**, might not be sufficient to reduce the impacts on the 9-San Bruno to a less than significant level, the Project impacts on the 9-San Bruno would remain *significant and unavoidable.*

23-Monterey, 24-Divisadero and 44-O'Shaughnessy - Project-related transit delays due to congestion on study area roadways and passenger boarding delays associated with increased ridership would result in significant impacts on the operation of the 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy. Along Palou Avenue these lines would be affected by the substantial congestion projected at the intersection of Third/Palou and the queues that would extend to the east and west of Third Street. Overall, the Project-related congestion would add up to 7 minutes of delay per bus during peak hours. The provision of transit-only lanes on Palou Avenue would reduce travel time delays and impacts on these lines.

Project Mitigation Measure 9.1: To address Project impacts to the 23-Monterey, 24-Divisidero and the 44-O'Shaughnessy, prior to issuance of a grading permit for Phase 1, the Project Applicant in cooperation with SFMTA shall conduct a study to evaluate the effectiveness and feasibility of the following improvements which could reduce Project impacts on transit operations along the Palou Avenue corridor, generally between Griffith Street and Newhall Street. The study shall create a monitoring program to determine the implementation extent and schedule (as identified below) to maintain the proposed headways of the 23-Monterey, 24-Divisidero and the 44-O'Shaughnessy.

- Convert one of the two westbound travel lanes on Palou Avenue between Keith Street and Newhall Street (three blocks) to a transit-only lane at all times. Treatment for transit-only lanes can range from striping to physical elevation changes to protect right-of-way from mixed-flow traffic. Because the westbound lanes between Third Street and Newhall Street are relatively narrow, parking would likely need to be prohibited on the north side of Palou Avenue between Third Street and Newhall Street (approximately 600 feet) during peak periods to maximize the effectiveness of the transit-only lane.

- Convert one of the two eastbound travel lanes on Palou Avenue between Newhall Street and Third Street (one block) to a transit-only lane at all times. Because the eastbound travel lanes between Newhall Street are relatively narrow, parking would likely need to be prohibited on the south side of Palou Avenue between Newhall Street and Third Street (approximately 600 feet) during peak periods to maximize the effectiveness of the transit-only lane. In the eastbound direction, east of Third Street, buses would re-enter the single mixed-flow traffic lane at the bus stop on the far (east) side of Third Street.

- There are currently pedestrian corner bulbs on the northwest and southwest corners of the intersection of Palou Avenue and Third Street. In order to accommodate the transit-only lanes west of Third Street, these bulbouts would be reconfigured or removed. Although removing pedestrian bulb-outs may increase pedestrian crossing distances and is generally inconsistent with the City's desire to prioritize pedestrian activity, in this case, the improvement would offer substantial benefits to transit travel times by allowing a transit-only lane through a congested intersection. This would be consistent with the City's transit-first policy.

- During the PM peak period only, prohibit parking on westbound Palou Avenue for the four-block segment between Griffith Street/Crisp Avenue and Keith Street, to provide for a PM peak period curb transit-only lane along this segment. This would create a continuous westbound transit-only lane on Palou

Avenue between Griffith Street/Crisp Avenue and Newhall Street during the PM peak period.

- As an alternative to the bulleted measures above, narrow the existing sidewalks on Palou Avenue from Third Street to Crisp Avenue (seven blocks) from 15 feet to 12 feet in width. The pedestrian bulb-outs on the west side of Third Street would be removed. The resulting 12-foot-wide sidewalks would be consistent with the Better Streets Plan guidelines. The reduction in sidewalk width would allow for the provision of a 7-foot-wide on-street parking lane, an 11-foot-wide transit-only lane, and a 10-foot-wide mixed-flow lane in each direction on Palou Avenue. This would preserve on-street parking along the corridor and provide a seven-block transit-only lane on Palou Avenue between Griffith Street/Crisp Avenue and Newhall Street. Treatment for transit-only lanes can range from striping to physical elevation changes to protect right-of-way from mixed-flow traffic.

The Project Applicant shall fully fund the costs of implementing the transit priority improvements (either the improvements identified above, or alternative improvements of equal or greater effectiveness and comparable cost) as determined by the study and the monitoring program. Other options to be evaluated in the study could include signal priority treatments at other signalized intersections including at Bayshore/Cortland, Bayshore/Industrial, and Bayshore/Oakdale.

Project Mitigation Measure 9.2: Should Project Mitigation Measure 9.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the 23-Monterey, the 24-Divisadero and the 44-O'Shaughnessy. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Implementation of the transit-only lanes would reduce travel times on the three routes:

<u>23-Monterey</u> – The Project would not result in Project-specific impacts to the 23-Monterey because increases in Project-generated vehicles would not increase intersection delay and transit travel times such that additional transit vehicles would be required to maintain the proposed headways. However, it would contribute to cumulatively significant impacts identified for the 2030 No Project condition. The mitigation measures identified for Palou Avenue would improve

service on the 23-Monterey, but the route would continue to experience cumulatively significant impacts.

24-Divisadero – Combined, these measures (either the first three bullets combined or the fourth alone) could reduce AM peak hour travel times by 4 minutes and 45 seconds in the westbound direction and by 4 minutes in the eastbound direction. During the PM peak hour travel times could be reduced by 8 minutes and 15 seconds in the westbound direction and by 4 minutes in the eastbound direction. In each direction and peak hour, the transit travel times with the Project might not be greater than the 2030 No Project travel times by more than ½ headway, and therefore additional transit vehicles would not be required.

44-O'Shaughnessy – The improvements along Palou Avenue between Keith Street and Newhall Street would improve the travel times on the 44-O'Shaughnessy such that in each direction and peak hour, the transit travel times with the Project would not be greater than the 2030 No Project travel times by more than ½ headway, and therefore additional vehicles would not be required to maintain the proposed headways.

With the combination of treatments identified in Project Mitigation Measure 9.1, transit travel times in each direction and during each peak period would be no greater than for 2030 No Project conditions. However, because 2030 No Project conditions constitute adverse delays to transit service, cumulative adverse delays to transit service would occur even with these Project transit mitigation measures. Because adverse transit delays affecting this line are generated by adverse traffic congestion to which the Project has a considerable contribution, the Project also has a cumulatively considerable contribution to adverse transit delays.

Implementation of Project Mitigation Measure 9.2, on the other hand, would allow operation of headways as described under Project Mitigation Measure 9.1. However, given the congestion along the Palou Avenue corridor, implementation of Project Mitigation Measure 9.2 alone, without Project Mitigation Measure 9.1, might not be sufficient to reduce the impact to less than significant levels.

Implementation of Project Mitigation Measure 9.1 would also exacerbate automobile LOS F conditions at the intersection of Third/Palou that would have significant and unavoidable impacts under Project conditions. In addition, these measures may result in new significant and unavoidable impacts at intersections along Palou Avenue (i.e., at Griffith/Crisp, Ingalls, Jennings, Lane, Keith Streets). Additional impacts of these mitigation measures would be similar to other Project impacts regarding traffic circulation, parking supply, loading supply and operations, and bicycle circulation.

Because a feasibility study of the improvements contemplated in Project Mitigation Measure 9.1 would be required, implementation of this measure is uncertain. Because implementation of

Project Mitigation Measure 9.2 alone, without Project Mitigation Measure 9.1, might not be sufficient to reduce the impacts on the 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy to a less than significant level, the Project impacts on the 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy would remain *significant and unavoidable.*

29-Sunset - Project-related transit delays due to congestion on study area roadways and passenger loading delays associated with increased ridership would result in significant impacts on the operation of the 29-Sunset. Within the study area, the 29-Sunset would experience substantial delays at key intersections along Gilman Avenue and Paul Avenue, particularly at Third Street and Bayshore Boulevard. Overall, the Project-related congestion would add up to 17 minutes of delay per bus during peak hours. The provision of transit-only lanes on Gilman Avenue and Paul Avenue would reduce travel time delays and impacts on this line.

> **Project Mitigation Measure 10.1:** To address Project impacts to the 29-Sunset, prior to issuance of a grading permit for Phase I, the Project Applicant in cooperation with SFMTA shall conduct a study to evaluate the effectiveness and feasibility of the following improvements which could reduce Project impacts on transit operations along the Gilman Avenue and Paul Avenue corridor, generally between Arelious Walker Drive and Bayshore Boulevard. The study shall create a monitoring program to determine the implementation extent and schedule (as identified below) to maintain the proposed headways of the 29-Sunset.
>
> - For the five-block segment of Gilman Avenue between Arelious Walker Drive and Third Street, prohibit on-street parking on westbound Gilman Avenue during the AM and PM peak periods to provide for three westbound travel lanes. During the peak periods convert one of the three westbound travel lanes to transit-only. During off-peak periods, parking would be allowed, and buses would travel in one of the two mixed-flow lanes. The peak period transit lanes would impact 90 parking spaces.
>
> - For the same five-block segment of Gilman Avenue between Arelious Walker Drive and Third Street, restripe the eastbound direction to provide two travel lanes, one of which would accommodate on-street parking and one of which would be a mixed-flow travel lane. During the AM and PM peak periods, prohibit on-street parking in the eastbound direction, and operate one of the two eastbound lanes as transit-only lanes. The peak period transit lanes would impact 80 parking spaces.
>
> - As an alternative to the two bulleted measures above, narrow the existing sidewalks on Gilman Avenue from Third Street to Griffith Street (four blocks) from 15 feet to 12 feet in width. The resulting 12-foot-wide sidewalks would

be consistent with the Better Streets Plan guidelines. The reduction in sidewalk width would allow for the provision of a 7-foot-wide on-street parking lane, an 11-foot-wide transit-only lane, and a 10-foot-wide mixed-flow lane in each direction on Gilman Avenue. This would preserve on-street parking along the corridor and provide four-block transit-only lanes on Gilman Avenue between Griffith Street and Third Street. Treatment for transit-only lanes can range from striping to physical elevation changes to protect right-of-way from mixed-flow traffic.

- Prohibit on-street parking on the north side of Paul Avenue, between Third Street and Bayshore Boulevard to create two westbound through lanes. Convert one westbound through lane to transit-only in the AM and PM peak periods. The peak period transit-only lane would impact 40 parking spaces. At the intersection of Paul Avenue and Bayshore Avenue, provide transit signal priority treatment (i.e., queue jump) to allow transit vehicles to maneuver into the mixed flow left-hand lane, facilitating a left-turn movement immediately west of Bayshore Boulevard from westbound Paul Avenue to southbound San Bruno.

The Project Applicant shall fully fund the costs of implementing the transit priority improvements (either the improvements identified above, or alternative improvements of equal or greater effectiveness and comparable cost) as determined by the study and the monitoring program. Other options to be evaluated in the study could include transit priority treatments on San Bruno Avenue, on the portions where the 29-Sunset travels.

Project Mitigation Measure 10.2: Should Project Mitigation Measure 10.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the 29-Sunset. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Implementation of transit-only lanes identified in mitigation measure Project Mitigation Measure 10.1 could reduce AM peak hour transit travel times by 4 minutes and 48 seconds in the westbound direction and 5 minutes and 10 seconds in the eastbound direction. During the PM peak, these measures would reduce transit travel times by 5 minutes and 20 seconds in the westbound direction and by 2 minutes in the eastbound direction. With the combination of mitigation measures, transit travel times in each direction and during each peak period would be no greater than for 2030 No Project conditions. However, because 2030 No Project conditions constitute adverse delays to transit service, cumulative adverse delays to transit service would occur even with these Project transit mitigation measures. Because adverse transit delays affecting this line are generated by adverse traffic congestion to which the Project has a considerable contribution, the Project also has a cumulatively considerable contribution to adverse transit delays.

Implementation of Project Mitigation Measure 10.1, on the other hand, would allow operation of headways as described under Project Mitigation Measure 7. However, given the congestion along the Gilman Avenue corridor, implementation of Project Mitigation Measure 10.2 alone, without Project Mitigation Measure 10.1, might not be sufficient to reduce the impact to less than significant levels.

Implementation of Project Mitigation Measure 10.1 would also exacerbate automobile LOS F conditions at the intersection of Third/Paul and Paul/Bayshore that was identified as having significant and unavoidable impacts. Additional impacts of these mitigation measures would be similar to Project impacts regarding traffic circulation, parking supply, loading supply and operations, and bicycle circulation.

Because a feasibility study of the improvements contemplated in mitigation measure Project Mitigation Measure 10.1 would be required, implementation of Project Mitigation Measure 10.1 is uncertain. Because implementation of Project Mitigation Measure 10.2 alone, without Project Mitigation Measure 10.1, might not be sufficient to reduce the impacts on the 29-Sunset to a less than significant level, the Project impacts on the 29-Sunset would remain *significant and unavoidable.*

48-Quintara-24th Street – Project-related transit delays due to congestion on study area roadways and passenger loading delays associated with increased ridership would result in significant impacts on the operation of the 48-Quintara-24th Street. Within the study area, the 48-Quintara-24th Street would experience substantial delays at key intersections along Evans Avenue, particularly at the key intersections with Third Street, Napoleon/Toland Streets and at Cesar Chavez Street. Overall, the Project-related congestion would add up to 3 minutes of delay per bus during peak hours. The provision of transit-only lanes on Evans Avenue and other transit-priority treatments would reduce travel time delays and impacts on this line.

> **Project Mitigation Measure 11.1:** To address Project impacts to the 48-Quintara-24th Street, prior to issuance of a grading permit for Phase I, the Project Applicant in cooperation with SFMTA shall conduct a study to evaluate the effectiveness and feasibility of the following improvements which could reduce Project impacts on transit operations along the Evans Avenue corridor, generally between Hunters Point Boulevard and Napoleon Street. The study shall create a monitoring program to determine the

implementation extent and schedule (as identified below) to maintain the proposed headways of the 48-Quintara-24th Street.

- On Evans Avenue, between Jennings Street and Napoleon Street (a nine-block segment—about 6,000 feet), convert one of the two travel lanes in each direction to a transit-only lane at all times. Treatment for transit-only lanes can range from striping to physical elevation changes or barriers to protect transit right-of-way from mixed-flow traffic.

The Project Applicant shall fully fund the costs of implementing the transit priority improvements (either the improvements identified above, or alternative improvements of equal or greater effectiveness and comparable cost) as determined by the study and the monitoring program. Other options to be evaluated in the study could include extension of transit only lanes in one or both directions between Napoleon Street and Cesar Chavez Street or onto Hunters Point Boulevard and Innes Avenue.

Project Mitigation Measure 11.2: Should Project Mitigation Measure 11.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the 48-Quintara-24th Street. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Provision of the transit-only lane on Evans Avenue, as identified in mitigation measure Project Mitigation Measure 11.1 would reduce AM peak hour transit travel times by 80 seconds in the westbound direction, and by 2 minutes and 33 seconds in the eastbound direction. During the PM peak hour transit travel times would be reduced by 1 minute and 40 seconds in the westbound direction, and by 2 minutes and 15 seconds in the eastbound direction. With the combination of mitigation measures, transit travel times in each direction and during each peak period would be no greater than for 2030 No Project conditions. However, because 2030 No Project conditions constitute adverse delays to transit service, cumulative adverse delays to transit service would occur even with these Project transit mitigation measures. Because adverse transit delays affecting this line are generated by adverse traffic congestion to which the Project has a considerable contribution, the Project also has a cumulatively considerable contribution to adverse transit delays.

Implementation of Project Mitigation Measure 11.2, on the other hand, would allow operation of headways as described under Project Mitigation Measure 7. However, given the congestion along Evans Avenue, implementation of Project Mitigation Measure 11.2 alone, without Project Mitigation Measure 11.1, might not be sufficient to reduce the impact to less than significant levels.

Implementation of Project Mitigation Measure 11.1 would also exacerbate automobile LOS F conditions at some intersections that were identified as significant and unavoidable impacts. In addition, it would ultimately be at SFMTA's discretion whether the transit-only lane would be implemented in the center lanes or in the lanes adjacent to the curb. Implementation of center-running lanes may have some operational benefit (depending on the results of feasibility study to be conducted if conditions warrant implementation of this measure), center-running lanes may result in loss of some additional on-street parking near stop platforms. Additional impacts of these mitigation measures would be similar to Project impacts regarding traffic circulation, parking supply, loading supply and operations, and bicycle circulation.

Because a feasibility study of the improvements contemplated in Project Mitigation Measure 11.1 would be required, implementation of Project Mitigation Measure 11.1 is uncertain. Because implementation of Project Mitigation Measure 11.2 alone, without Project Mitigation Measure 11.1, might not be sufficient to reduce the impacts on the 48-Quintara-24th Street to a less than significant level, the Project impacts on the 48-Quintara-24th Street would remain *significant and unavoidable.*

54-Felton – Additional traffic congestion associated with Project vehicle trips would result in significant impacts to the operations of the 54-Felton, particularly during the PM peak hour. Overall, the Project-related congestion would add up to 6 minutes of delay per bus during peak hours. However, unlike many of the other transit routes within the study area, the 54-Felton provides a relatively circuitous neighborhood collector service, which typically includes a number of turns and short distances on individual streets. As a result, mitigation measures that provide transit-only lanes are not practical due to the difficulty of accommodating turning movements at intersections. Further, although the 54-Felton would travel along Third Street between Palou Avenue and Hudson Street, relocating the 54-Felton to the dedicated light rail transit right of way in the center of Third Street would not be feasible because the train platforms are high-floor and on the left-hand side and buses load and unload from the right-hand side at low-floor stops. There is not adequate space in the existing right-of-way to provide new platforms to load and unload passengers from a bus in this area.

> **Project Mitigation Measure 12:** SFMTA shall purchase additional transit vehicles and contribute to operating costs and facility improvements to mitigate the Project impacts and Project contribution to cumulative impacts to headways on 54-Felton. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated

ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

While the provision of additional transit vehicles for the 54-Felton would reduce impacts associated with increased travel times, the transit vehicles would still be subject to delays resulting from increased congestion, and therefore Project impacts on the 54-Felton would remain *significant and unavoidable.*

T-Third – Project-related transit delays due to congestion on Third Street and passenger loading delays associated with increased ridership would result in significant impacts on the operation of the T-Third. Within the study area, the T-Third would primarily experience delays related to increased traffic volumes within the segment between Thomas Avenue and Kirkwood Avenue where the light rail operates within a mixed-flow travel lane. Along the remainder of Third Street and Bayshore Boulevard, the T-Third operates within an exclusive right-of-way. Overall, the Project-related congestion would add up to 3 minutes of delay per bus during peak hours. Providing exclusive right-of-way for the T-Third in the segment between Thomas Avenue and Kirkwood Avenue would reduce travel time delays for the T-Third.

Project Mitigation Measure 13.1: To address Project impacts to the T-Third, prior to issuance of a grading permit for Phase I, the Project Applicant in cooperation with SFMTA shall conduct a study to evaluate the effectiveness and feasibility of the following improvement that could reduce Project impacts on transit operations along Third Street between Thomas Avenue and Kirkwood Avenue. The study shall create a monitoring program to determine the implementation extent and schedule (as identified below) to maintain the proposed headways of the T-Third.

- Reconfigure the section of Third Street between Thomas Avenue and Kirkwood Avenue (9 blocks) where the light rail vehicles currently share the travel lane with auto traffic to provide a dedicated transit right-of-way, consistent with the rest of the route. This would require either removal of one travel lane in each direction on Third Street, or removal of on-street parking and some sidewalk bulbouts. In addition, left-turns from Third Street in this segment would be restricted in both directions. Treatment for transit-only lanes can range from striping to physical elevation or barriers to protect transit right-of-way from mixed-flow traffic.

Implementation of the intersection reconfiguration shall be the responsibility of SFMTA, and shall be implemented when the results of the study described above indicate transit improvements are necessary. The Project Applicant shall fully fund the costs of implementing the transit priority improvements prior to approval of subsequent phases of development.

> **Project Mitigation Measure 13.2:** Should Project Mitigation Measure 13.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the T-Third. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Providing an exclusive right-of-way for the T-Third would reduce all delays associated with traffic congestion on Third Street during both AM and PM peak periods, such that transit travel times in year 2030 with the Project would be less than under than existing conditions.

Implementation of Project Mitigation Measure 13.2, on the other hand, would allow operation of headways as described under Project Mitigation Measure 7. However, given the congestion along Third Street, implementation of Project Mitigation Measure 13.2 alone, without Project Mitigation Measure 13.1, might not be sufficient to reduce the impact to less than significant levels.

Implementation of mitigation measure Project Mitigation Measure 13.2 would also exacerbate automobile LOS F conditions at intersections along Third Street that were identified as significant and unavoidable impacts. Additional impacts of these mitigation measures would be similar to Project impacts regarding traffic circulation, parking supply, loading supply and operations, and bicycle circulation.

Because a feasibility study of the improvements contemplated in Project Mitigation Measure 13.1 would be required, implementation of Project Mitigation Measure 13.1 is uncertain. Because implementation of Project Mitigation Measure 13.2 alone, without Project Mitigation Measure 13.1, might not be sufficient to reduce the impacts on the T-Third to a less than significant level, the Project impacts on the T-Third would remain *significant and unavoidable.*

28L-19th Avenue/Geneva Limited – Increased congestion associated with Project vehicle trips would impact the operations of the 28L-19th Avenue/Geneva Limited, which would be a significant impact. In the Project vicinity, the 28L-19th Avenue/Geneva Limited would generally travel in the exclusive BRT lanes, but would be subject to delays at the intersection of Geneva Avenue and Bayshore Boulevard. Overall, the Project-related congestion would add up to 4 minutes of delay per bus during peak hours. The intersection of Bayshore/Geneva would be reconfigured as part of the Geneva Avenue Extension project, and the provision of transit-only lanes on Geneva Avenue on the eastbound and westbound approaches to the intersection would reduce the impact of cumulative congestion.

Project Mitigation Measure 14.1: The City of Brisbane, as part of the Geneva Avenue Extension Project, shall account for existing traffic, background traffic growth, and the most recent forecasts of traffic expected to be associated with each of several adjacent development projects, including the Project. The San Francisco County Transportation Authority (SFCTA) and SFMTA shall coordinate with the City of Brisbane to ensure transit preferential treatment is accounted for in the design of the Geneva Avenue Extension.

Project Mitigation Measure 14.2: Should Project Mitigation Measure 14.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the 28L-19th Avenue/Geneva Limited. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Since implementation of Project Mitigation Measure 14.1 would be under the jurisdiction of the City of Brisbane, the implementation of the mitigation measure is uncertain. Implementation of Project Mitigation Measure 14.2, on the other hand, would allow operation of headways as described under Project Mitigation Measure 7. However, given the congestion along Geneva Avenue, implementation of Project Mitigation Measure 14.2 alone, without Project Mitigation Measure 14.1, might not be sufficient to reduce the impact to less than significant levels.

Because implementation of Project Mitigation Measure 14.2 alone, without Project Mitigation Measure 14.1, might not be sufficient to reduce the impacts on the 28L-19th Avenue/Geneva Limited to a less than significant level, the Project impacts on the 28L-19th Avenue/Geneva Limited would remain *significant and unavoidable.*

9X, 9AX, 9BX-Bayshore Expresses, 14X-Mission Express, CPX-Candlestick Express and HPX-Hunters Point Express – As described in traffic section above, the Project would contribute to cumulative traffic impacts on U.S. 101 northbound and southbound. The projected increases in congestion would affect transit lines operating on U.S. 101, notably the 9X, 9AX, and 9BX-Bayshore Expresses, and the 14X-Mission Express (the 14X-Mission Express operates southbound on U.S. 101, and northbound on I-280). The Project's new CPX-Candlestick Express between Candlestick Point and downtown would also use U.S. 101, and the HPX-Hunters Point Express would use I-280, and both would be subject to increased travel times due to freeway congestion. The Project's contribution to cumulative traffic congestion on U.S. 101 and associated delays to express bus service operating on U.S. 101 would be considered a significant impact on transit operations.

Potential strategies to reduce congestion impacts on transit travel times could include bus-only operation on the shoulders of U.S. 101, re-opening of the U.S. 101 northbound Silver Avenue on-ramp for transit only, and creating transit-only lanes on I-280 along with rerouting of the transit lines to I-280. Additional studies and coordination with Caltrans would be required to determine the feasibility of these strategies. As feasibility of these strategies is uncertain, the impact on the 9X, 9AX, 9BX-Bayshore Expresses, the 14X-Mission Express, and the new CPX-Candlestick Express and the HPX-Hunters Point Express operations would remain *significant and unavoidable*.

Regional Transit - As described above in the traffic intersection and freeway impact analysis, the Project would increase congestion and contribute to cumulative traffic congestion on Bayshore Boulevard and on U.S. 101, which would impact the travel times of SamTrans buses using these facilities. Potential strategies to reduce transit delay could include providing transit-only lanes on Bayshore Boulevard, permitting bus-only use of the shoulders of U.S. 101, and providing transit-only lanes on I-280 (and rerouting SamTrans buses from U.S. 101 to I-280).

Additional studies and coordination with SamTrans, Caltrans, and the City of Brisbane would be required to determine the feasibility of these strategies. Since implementation of these strategies is uncertain the impact on SamTrans bus operations would remain *significant and unavoidable*.

Project Variants

During the AM peak hour Project Variants 1 and 2 would require additional transit vehicles on the same routes as the Project. During the PM peak hour, Project Variants 1 and 2 would require additional vehicles on the same routes as the Project, except that the Variants would also require additional vehicles on the 48-Quintara-24th Street. The number of vehicles required for each peak hour for the Project and the two Project Variants is shown in **Table 75**, above. Impacts associated with Project Variants 1 and 2 would be somewhat more extensive than those for the Project. Project Variant 1 would require 10 additional vehicles in the AM peak hour, and 15 additional vehicles in the PM peak hour. Project Variant 2 would require 8 additional vehicles in the AM peak hour, and 12 additional vehicles in the PM peak hour. As with the Project, these vehicles would be in addition to those required to maintain 2030 No Project headways.

Project Mitigation Measures 7 though 14.2 above would be applicable for Project Variants 1 and 2, and reduce the impacts associated with Project Variants 1 and 2 by similar amounts as described above. However, as with the Project, impacts on transit operations would remain *significant and unavoidable*.

6.2.2 Alternatives to the Project

This section describes the transit impacts associated with Project Alternatives.

Transit Capacity Utilization

For each of the Project Alternatives, **Table 79** summarizes the additional transit trips and overall capacity utilization for each of the three study area Muni cordons during the AM and PM peak hours. **Table 80** presents the Project Alternative additional transit trips and capacity utilization at the Muni downtown screenlines, while **Table 81** presents the Alternative additional transit trips and capacity utilization for the regional screenlines. It should be noted that Alternatives 2, 3, 4 and 5 assumed the same transit improvements as the Project, and therefore capacity during the AM and PM peak hours would be the same. Alternative 1 (the No Project condition) would only include the planned TEP improvements, and, as indicated in **Table 72**, peak hour capacity within the study area and at the cordons would decrease slightly.

Table 79
Muni Ridership and Capacity Utilization at Study Area Cordons
Alternatives to the Project – Weekday AM and PM Peak Hours

Peak Hour/Cordon	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.
AM Peak Hour										
East of Third Cordon										
Inbound	1,353	79%	2,547	64%	2,191	55%	2,381	60%	2,511	63%
Outbound	1,577	92%	1,540	39%	1,284	32%	1,348	32%	1,504	38%
North Cordon										
Inbound	2,065	117%	2,458	69%	2,216	62%	2,349	66%	2,455	69%
Outbound	1,901	107%	2,151	61%	2,069	58%	2,083	59%	2,134	60%
West Cordon										
Inbound	2,053	92%	3,163	79%	2,853	71%	3,063	77%	3,056	76%
Outbound	1,536	69%	1,869	47%	1,732	43%	1,753	44%	1,857	46%
PM Peak Hour										
East of Third Cordon										
Inbound	1,382	81%	2,002	50%	1,529	38%	1,704	43%	2,004	50%
Outbound	848	49%	2,091	52%	1,470	37%	1,871	47%	2,148	54%
North Cordon										
Inbound	2,049	116%	2,675	75%	2,262	64%	2,469	70%	2,630	74%
Outbound	1,628	92%	2,231	63%	1,821	51%	2,065	58%	2,227	63%
West Cordon										
Inbound	1,196	54%	1,937	48%	1,602	40%	1,791	45%	1,915	47%
Outbound	1,249	56%	2,374	59%	2,017	50%	2,250	56%	2,401	60%

Source: Fehr & Peers.

Table 80
Muni Ridership and Capacity Utilization at Downtown Screenlines
Alternatives to the Project – Weekday AM and PM Peak Hours

Peak Hour/Screenline	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.
AM Peak Hour										
Northeast	3,008	78%	3,008	78%	3,008	78%	3,008	78%	3,008	78%
Northwest	8,949	75%	8,949	75%	8,949	75%	8,949	75%	8,949	75%
Southeast	7,248	71%	7,536	74%	7323	72%	7460	73%	7550	74%
Southwest	7,674	76%	7,674	76%	7,674	76%	7,674	76%	7,674	76%
Total All Screenlines	26,879	74%	27,167	75%	27,167	75%	27,167	75%	27,167	75%
PM Peak Hour										
Northeast	3,140	67%	3,140	78%	3,140	78%	3,140	78%	3,140	78%
Northwest	8,155	70%	8,155	75%	8,155	75%	8,155	75%	8,155	75%
Southeast	7,733	78%	8,223	83%	7847	79%	8098	81%	8254	83%
Southwest	8,829	82%	8,829	82%	8,829	82%	8,829	82%	8,829	82%
Total All Screenlines	27,857	75%	28,347	80%	28,347	80%	28,347	80%	28,347	80%

Source: Fehr & Peers.

Table 81
Ridership and Capacity Utilization at Regional Screenlines
Alternatives to the Project – Weekday AM and PM Peak Hours

Peak Hour/Regional Cordon	Alternative 1 No Project		Alternative 2 No Bridge		Alternative 3 49ers at Candlestick		Alternative 4 Lesser Build		Alternative 5 No Park Agreement	
	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.	Total Ridership	% Util.
AM Peak Hour										
East Bay										
BART	36,202	185%	36,202	185%	36,195	185%	36,193	185%	36,198	185%
AC Transit	3,347	61%	3,347	61%	3,347	61%	3,347	61%	3,347	61%
Ferries	1,971	83%	1,971	83%	1,971	83%	1,971	83%	1,971	83%
subtotal	41,520	151%	41,520	151%	41,513	151%	41,511	151%	41,516	151%
North Bay										
Golden Gate Transit	2,621	106%	2,621	106%	2,621	106%	2,621	106%	2,621	106%
Ferries	1,647	97%	1,647	97%	1,647	97%	1,647	97%	1,647	97%
subtotal	4,268	102%	4,268	102%	4,268	102%	4,268	102%	4,268	102%
South Bay										
BART	12,409	89%	12,416	89%	12,396	89%	12,396	89%	12,413	89%
Caltrain	4,454	70%	4,451	70%	4,432	69%	4,443	69%	4,449	70%
SamTrans	794	75%	799	75%	784	74%	794	75%	798	75%
Ferries	152	51%	152	51%	152	51%	152	51%	152	51%
subtotal	17,809	82%	17,818	82%	17,765	82%	17,785	82%	17,812	82%
Total All Screenlines	***63,597***	***119%***	***63,606***	***119%***	***63,546***	***119%***	***63,564***	***119%***	***63,596***	***119%***
PM Peak Hour										
East Bay										
BART	30,241	154%	30,268	154%	30,247	154%	30,258	154%	30,267	154%
AC Transit	4,485	68%	4,485	68%	4,485	68%	4,485	68%	4,485	68%
Ferries	2,147	79%	2,147	79%	2,147	79%	2,147	79%	2,147	79%
subtotal	36,873	128%	36,900	128%	36,879	128%	36,890	128%	36,899	128%
North Bay										
Golden Gate Transit	2,513	114%	2,513	114%	2,513	114%	2,513	114%	2,513	114%
Ferries	1,630	96%	1,630	96%	1,630	96%	1,630	96%	1,630	96%
subtotal	4,143	106%	4,143	106%	4,143	106%	4,143	106%	4,143	106%
South Bay										
BART	10,631	76%	10,707	76%	10,647	76%	10,684	76%	10,708	76%
Caltrain	3,959	62%	4,008	63%	3,964	62%	3,995	62%	4,013	63%
SamTrans	362	39%	404	43%	367	39%	396	42%	408	43%
Ferries	75	25%	75	25%	75	25%	75	25%	75	25%
subtotal	15,027	69%	15,194	70%	15,053	70%	15,150	70%	15,204	70%
Total All Screenlines	***56,043***	***103%***	***56,237***	***103%***	***56,075***	***103%***	***56,183***	***103%***	***56,246***	***103%***

Source: AECOM, Fehr & Peers.

The Alternatives would contribute slightly fewer trips to the South Bay cordon in the off-peak directions (southbound in the AM peak hour and northbound in the PM peak hour) than in the peak directions. Off-peak direction ridership would remain within available capacity in the AM and PM peak hours. Generally, the project cordons would operate at similar or lower capacity utilization under Alternatives 2, 3, 4, and 5 than with the Project. The exception to this is that Alternative 5 would have slightly higher capacity utilization on the East of Third Cordon and the West Cordon in the outbound direction in the PM peak hour only. However, all cordons would operate within Muni's 85 percent capacity utilization under Alternatives 2, 3, 4, and 5. As described in the previous chapter, the study area cordons would exceed the 85 percent capacity utilization standard under Alternative 1 on the North Cordon, in both the inbound and outbound directions during the AM and PM peak hours. During the AM peak hour, the East of Third Cordon in the outbound direction and the West Cordon in the inbound direction would exceed Muni's capacity utilization standard.

The Alternatives to the Project would add trips to the southeast downtown screenline. Under Alternatives 1, 2, 3, 4, and 5, the capacity utilization of the southeast screenline would be the same as or lower than it would be with the Project, and in all cases, would operate below Muni's 85 percent capacity utilization standard.

Regional cordons would operate at the same percentage of capacity utilization with the Project Alternatives as under 2030 No Project conditions, with one exception. The capacity utilization for the South Bay would increase from 69 to 70 percent during the PM peak hour for each of the Alternatives compared to the 2030 No Project condition. Overall, the Alternatives would not increase the capacity utilization by more than one percentage point on any cordon expected to exceed available capacity without the project. Further, the project alternatives would not cause any cordon expected to operate within available capacity without the project to exceed its capacity.

Alternative 1 – No Project: Under Alternative 1 (No Project) transit ridership at the cordons would increase due to projected development within the India Basin area and Hunters Point Shipyard. The North, West and East of Third cordons would operate at more than the capacity utilization standard of 85 percent, and therefore there would be significant cumulative (2030 No Project) transit impacts at these cordons.

The existing Hunters Point Shipyard Mitigation Monitoring and Reporting Program (MMRP) includes adoption of a TDM program (including forming a Transportation Management Association) and a Transportation System Management Plan (including measures such as transit pass sales, transportation option information, employee transit subsidies, expansion of transit service, secure bicycle parking, parking management guidelines, flexible work hours, and shuttle service). The measure shall be implemented per the requirements of the existing MMRP.

Since implementation of the mitigation measures included in the Hunters Point Shipyard MMRP is not certain, Project Alternative 1 impacts on transit capacity at the study area cordons would remain *significant and unavoidable.*

Alternative 1 contributions to the significant transit impacts at the regional screenlines under 2030 No Project conditions would be *less than significant.*

Alternative 2 – No Bridge: The transit operating plan assumed for Alternative 2 would be the same as for the Project. However, since the Yosemite Slough bridge would not be constructed, and the BRT route would travel around Yosemite Slough. The alternate route would extend west on Carroll Avenue, north on Hawes Street, west on Armstrong Avenue to an abandoned railroad right-of-way, previously operated by the United States Navy. The BRT route would then travel along this right-of-way, just east of Ingalls Street, to its intersection with Shafter Street, just east of Hawes Street. The BRT route would travel east on Shafter Street to Arelious Walker Drive, where it would resume its primary proposed route into Hunters Point Shipyard.

Although the alternate route around Yosemite Slough would be technically feasible, it would not be the optimal configuration for a BRT system. A fundamental component of BRT service is direct, fast, and reliable travel in dedicated right-of-way, typically with signal priority given to the BRT vehicles. When these elements are combined, the BRT service takes on a higher-quality character than typical local bus service. The Yosemite Slough bridge would provide such a service in the project study area by providing dedicated right-of-way and providing the most direct route of travel between the Hunters Point Shipyard and points to the west, including Candlestick Point, the Bayshore Caltrain station, and the Balboa Park BART station.

If the Yosemite Slough bridge were not in place, only one transit route (the 28L-19th Avenue/Geneva BRT route) would be affected. BRT travel times, particularly between major development and regional transit connections (e.g., Caltrain and BART) would increase by approximately five minutes. As a result, BRT ridership to and from the Hunters Point Shipyard would decrease by approximately 15 percent to the forecasts presented for the Project. However, because this represents a relatively small portion of the overall project transit ridership, the additional traffic generated by the Project Alternative 2 would be minimal, and thus, a separate analysis was not conducted.

With the Muni transit capacity increases assumed for Alternative 2, compared to the No Project Alternative 1, the total transit travel demand on Muni would be accommodated at each of the three the cordons during the AM and PM peak hours. At the regional screenlines, Alternative 2 would contribute minimally to future ridership and contributions to future cumulative impacts would be less than significant. As with the Project, Alternative 2 impacts on transit capacity would be *less than significant.*

Alternative 3 – 49ers at Candlestick: Under Alternative 3, the 49ers would remain at Candlestick Park and proposed development would occur primarily in the Hunters Point Shipyard. The transit operating plan assumed for Alternative 3 would be the same as for the Project. Under Alternative 3, the Yosemite Slough bridge would only be for pedestrians, bicycles, and the BRT route. Therefore, the bridge would be somewhat narrower than proposed for the Project, but would function the same as under the Project on non-game days.

Transit ridership associated with Alternative 3 would be less than with the Project. With the Muni transit capacity increases assumed for Alternative 3, the total transit travel demand on Muni would be accommodated at each of the three cordons during the AM and PM peak hours. At the regional screenlines, Alternative 3 would contribute minimally (and less than the Project) to future ridership and contributions to future regional cumulative transit impacts would be less than significant. As with the Project, Alternative 3 impacts on transit capacity would be *less than significant.*

Alternative 4 – Lesser Build: Alternative 4 assumes a general reduction in development as compared to the Project, and therefore transit travel demand would be less. The transit operating plan assumed for Alternative 4 would be the same as for the Project. Under Alternative 4, the Yosemite Slough bridge would not be constructed, and, as with Alternative 2, the BRT route would travel around Yosemite Slough using the former railroad right-of-way. Similar to Alternative 2, the increased travel time of approximately five minutes for the BRT route would somewhat reduce ridership on the BRT line for trips to and from the Hunters Point Shipyard, but overall, the increase in project-generated automobile traffic associated with this travel time increase would be negligible.

With the Muni transit capacity increases assumed for Alternative 4, the total transit travel demand on Muni would be accommodated at each of the three cordons during the AM and PM peak hours. At the regional screenlines, Alternative 4 would contribute minimally (and less than the Project) to future ridership and contributions to future regional cumulative transit impacts would be less than significant. As with the Project, Alternative 4 impacts on transit capacity would be *less than significant.*

Alternative 5 – No Park Agreement: Alternative 5 assumes a similar land use program as the Project Variant 2 (1,350 residential units more than the Project within Hunters Point Shipyard), and therefore transit travel demand would be greater than with the Project. The transit operating plan assumed for Alternative 5 would be the same as for the Project. Under Alternative 5, the Yosemite Slough bridge would not be constructed, and the proposed BRT route would be the same as for Alternatives 2 and 4, with similar effects on BRT travel times and ridership.

With the Muni transit capacity increases assumed for Alternative 5, the total transit travel demand on Muni would be accommodated at each of the three cordons during the AM and PM peak hours. At the regional screenlines, Alternative 5 would contribute minimally (and less than the Project) to future ridership and contributions to future regional cumulative transit impacts would be less than significant. As with the Project, Alternative 5 impacts on transit capacity would be *less than significant.*

Alternatives Transit Delay

Table 82 presents the travel time increases associated with the project alternatives for each transit line in the study area. Although neither Alternative 1 nor the existing conditions include extensions of transit routes into the project site, the analysis of increases to transit travel times over existing conditions associated with Alternative 1 was conducted for the same segments as the Project, to provide a meaningful comparison. **Table 83** identifies the number of additional vehicles that would be required to meet the proposed headways.

Alternative 1 – No Project: As shown on **Table 83**, under Alternative 1 - No Project, traffic and ridership demands would increase and result in the need for an additional 16 transit vehicles for seven routes in the AM peak hour, and an additional 16 vehicles for six routes in the PM peak hour. During the AM peak hour, additional vehicles would be required on the 9-San Bruno (5 vehicles), 24-Divisadero (1 vehicle), 28L-19th Avenue Limited (1 vehicle), 29-Sunset (1 vehicle), 44-O'Shaughnessy (2 vehicles), the 48-Quintara-24th Street (1 vehicle), the 54-Felton (1 vehicle) and the T-Third (2 train cars). In the PM peak hour, additional vehicles would be needed on the 9-San Bruno (7 vehicles), 23-Monterey (1 vehicle), 28L-19th Avenue Limited (1 vehicle), 44-O'Shaughnessy (3 vehicles), 48-Quintara-24th Street (1 vehicle), 54-Felton (1 vehicle), and the T-Third (1 train car). These would be significant No Project impacts.

Alternative 2 – No Bridge: Transit impacts associated with Alternative 2 would be the same as for the Project, with the exception of the 28L-19th Avenue/Geneva Limited. Under Alternative 2, the Yosemite Slough bridge would not be constructed, and the BRT travel times would increase by about 5 minutes since the BRT route would need to travel around the slough. During the AM peak hour, an additional 7 vehicles would be required to maintain projected headways, and during the PM peak hour and additional 12 vehicles would be required. As for the Project, these transit vehicles would be in addition to those identified to maintain 2030 No Project conditions (16 vehicles in the AM peak hour, and 16 vehicles in the PM peak hour).

Project Mitigation Measures 7 through 14.2 would also be applicable for Alternative 2. As with the Project, Project Mitigation Measures 7 through 14.2 would reduce, but not eliminate, Alternative 3 impacts on transit operations. Alternative 2 impacts on transit operations would therefore remain *significant and unavoidable.*

Table 82
Project Increases to Transit Travel Time (minutes:seconds)[1, 2]
Alternatives to the Project – Weekday AM and PM Peak Hours [3]

Route	Proposed Headway (min.)	Northbound / Eastbound			Southbound / Westbound		
		Alt. 1 No Project	Alt. 3 49ers at Candlestick	Alt. 4 Lesser Build	Alt. 1 No Project	Alt. 3 49ers at Candlestick	Alt. 4 Lesser Build
AM Peak Hour							
9-San Bruno	10	**39:27**	-1:06	**0:53**	**9:20**	0:25	**7:26**
23-Monterey	15	8:24	0:07	0:35	3:33	0:18	3:50
24-Divisadero	6	**2:58**	**9:19**	**9:11**	**5:52**	**-2:14**	**-1:33**
28L-19th Ave Ltd	5	**1:44**	0:00	1:21	**7:24**	0:00	0:00
29-Sunset	10	**6:19**	0:39	**6:21**	**3:42**	2:35	**8:40**
44-O'Shaughnessy	6	**11:06**	**6:11**	**4:24**	**8:25**	**5:09**	**4:58**
48-Quintara-24th St	15	**5:38**	**3:17**	**2:09**	**2:08**	**6:20**	**5:43**
54-Felton [4]	20	**4:24**	-0:02	-0:54	**4:59**	-2:18	-3:05
T-Third	8	**7:01**	0:54	1:13	**5:13**	1:39	1:39
PM Peak Hour							
9-San Bruno	10	**43:53**	0:52	**3:12**	**23:02**	1:21	**6:15**
23-Monterey	15	**8:14**	0:42	0:54	**10:26**	0:34	1:44
24-Divisadero	6	0:55	**3:35**	**4:35**	0:02	**4:33**	**7:33**
28L-19th Ave Ltd	5	**2:26**	**3:23**	-4:49	**5:33**	**0:03**	-4:57
29-Sunset	10	2:36	3:09	**13:56**	1:58	-1:14	**15:05**
44-O'Shaughnessy	6	**12:57**	**4:48**	**4:01**	**10:21**	**8:07**	**5:53**
48-Quintara-24th St	15	**5:49**	**7:19**	**6:07**	**7:48**	**7:13**	**4:47**
54-Felton [4]	20	**13:31**	**3:28**	**3:28**	**6:56**	**2:43**	**3:15**
T-Third	8	**4:16**	1:54	**2:17**	**5:13**	1:07	**1:58**

Notes:
1. Delays measured for each route between project site and key destination/transfer point away from the project. The study segment for each route is as follows:
- 9-San Bruno: Bayshore Boulevard between Sunnydale Avenue and Jerrold Avenue
- 23-Monterey: between Ingalls Street/Oakdale Avenue and the Glen Park BART Station
- 24-Divisadero: between Hunters Point Shipyard and Mission Street
- 28L-19th Avenue: between Hunters Point Shipyard and Mission Street
- 29-Sunset: between Candlestick Point and Mission Street
- 44-O'Shaughnessy: between Hunters Point Shipyard and the Glen Park BART Station
- 48-Quintara-24th St: between Hunters Point Shipyard and the 24th Street BART Station
- 54-Felton: between Jerrold Avenue/Earl Street and Mission Street
- T-Third: Third Street between Thomas Avenue and Jerrold Avenue (This segment represents the section of the T-Third route that does not provide exclusive right-of-way for transit and would be most affected by increased traffic congestion.)

2. Routes where project would increase travel times such that additional vehicles would be required highlighted in **bold**.
3. Travel times for Alternative 2 same as for Project, and travel times for Alternative 5 same as Project Variant 2, as presented on Table 76. The exception is the 28L-19th Avenue Limited, were travel times in each direction would increase by five minutes per direction as neither Alternative 2 nor Alternative 5 would include the Yosemite Slough bridge.
4. Due to roadway improvements proposed by the Project and differences between the No Project and Project land use assumptions in the Hunters Point Shipyard, there would be less traffic congestion along 54-Felton route in the study area with the Project, than under 2030 No Project conditions.
Source: Fehr & Peers.

Table 83
Additional Muni Transit Vehicle Requirements
Alternatives to the Project – Weekday AM and PM Peak Hours

Route	Alternative 1 No Project	Alternative 2 No Bridge	Alternative 3 49ers at Candlestick	Alternative 4 Lesser Build	Alternative 5 No Park Agreement
AM Peak Hour					
9-San Bruno	5	1	0	1	1
23-Monterey	1	0	0	0	0
24-Divisadero	1	1	1	1	2
28L-19th Ave Ltd	1	1	0	0	1
29-Sunset	1	1	0	2	1
44-O'Shaughnessy	3	2	2	2	2
48-Quintara-24th St	1	1	1	1	1
54-Felton [2]	1	0	0	0	0
T-Third	2	0	0	0	0
Total	*16*	*7*	*4*	*7*	*8*
PM Peak Hour					
9-San Bruno	7	1	0	1	1
23-Monterey	1	0	0	0	0
24-Divisadero	0	3	1	2	2
28L-19th Ave Ltd	1	1	1	0	1
29-Sunset	0	3	0	3	3
44-O'Shaughnessy	4	2	2	2	2
48-Quintara-24th St	1	0	1	1	1
54-Felton	1	1	1	1	1
T-Third	1	1	0	1	1
Total	*16*	*12*	*6*	*11*	*12*

Note:
1. Transit vehicle requirements for Alternatives 2 through 5 are in addition to those required for the 2030 No Project condition (Alternative 1).
Source: Fehr & Peers.

Alternative 3 – 49ers at Candlestick: Alternative 3 would result in the need for additional transit vehicles beyond those required for 2030 No Project conditions on three routes in the AM peak hour and on five routes in the PM peak hour. During the AM peak hour, 4 vehicles would be required to maintain proposed headways on the 24-Divisadero (1 vehicle), 44-O'Shaughnessy (2 vehicles), and the 48-Quintara-24th Street (1 vehicle). During the PM peak hour, 6 additional vehicles would be needed for the 24-Divisadero (1 vehicle), 28L-19th Avenue Limited (1 vehicle), 44-O'Shaughnessy (2 vehicles), 48-Quintara-24th Street (1 vehicle), and 54-Felton (1 vehicle) routes. Impacts associated with Alternative 3 would be somewhat less than those for the Project.

Project Mitigation Measures 7 through 14.2 would also be applicable for Alternative 3. As with the Project, Project Mitigation Measures 7 through 14.2 would reduce, but not eliminate, Alternative 3 impacts on transit operations. Alternative 3 impacts on transit operations would therefore remain *significant and unavoidable.*

Alternative 4 – Lesser Build: Alternative 4 would result in the need for 7 additional transit vehicles beyond those required for 2030 No Project conditions on five routes during the AM peak hour, and an additional 11 vehicles for seven routes during the PM peak hour. During the AM peak hour, additional vehicles would be required on the 9-San Bruno (1 vehicle), 24-Divisadero (1 vehicle), 29-Sunset (2 vehicles), 44-O'Shaughnessy (2 vehicles), and the 48-Quintara-24th Street (1 vehicle). In the PM peak hour, additional vehicles would be required on the 9-San Bruno (1 vehicle), 24-Divisadero (2 vehicles), 29-Sunset (3 vehicles), 44-O'Shaughnessy (1 vehicle), 48-Quintara-24th Street (1 vehicle), 54-Felton (1 vehicle), and the T-Third (1 train car). Impacts associated with Alternative 4 would be somewhat less than those for the Project.

Project Mitigation Measures 7 through 14.2 would also be applicable for Alternative 4. As with the Project, Project Mitigation Measures 7 through 14.2 would reduce, but not eliminate, Alternative 4 impacts on transit operations. Alternative 3 impacts on transit operations would therefore remain *significant and unavoidable.*

Alternative 5 – No Park Agreement: Since the land use program and transit operating plan for Alternative 5 would be the same as for Project Variant 2, transit impacts for Alternative 5 would be the same as Project Variant 2, with the exception of the 28L-19th Avenue/Geneva Limited. Under Alternative 5, the Yosemite Slough bridge would not be constructed, and the BRT travel times would increase by about 5 minutes since the BRT would need to travel around the slough. Project Mitigation Measures 7 through 14.2 would also be applicable for Alternative 5. As with the Project, Project Mitigation Measures 7 through 14.2 would reduce, but not eliminate, Alternative 5 impacts on transit operations. Alternative 3 impacts on transit operations would therefore remain *significant and unavoidable.*

6.3 BICYCLE IMPACTS

6.3.1 Project and Project Variants

The street network proposed for Candlestick Point would be an extension of the existing grid of the adjacent Bayview neighborhood, which would facilitate access between the new uses and the rest of San Francisco, and provide a connection between existing Bayview/South Basin neighborhoods and the existing and proposed waterfront amenities.

A number of existing and proposed study area roadways would include bicycle facilities in the form of bicycle lanes (Class II facilities) or signed routes (Class III facilities – e.g., roadways with sharrow designations) that would facilitate bicycling within and in the vicinity of the Project area. Off-street Class I pathways would be provided around the bayside perimeter of

Candlestick Point, across the proposed Yosemite Slough bridge, and into Hunters Point Boulevard via Crisp Avenue. Within the Project area, the Bay Trail would also be completed. **Figure 8** in Chapter 2 presented the proposed improvements.

Outside of the Project site, street improvements would include striping of bicycle lanes on Innes Avenue, Gilman Avenue, Jamestown Avenue and on Harney Way. As noted in section 4.3.3, the Bicycle Plan includes a near-term project on Innes Avenue (Bicycle Route #68) between Donahue Street and Hunters Point Boulevard, however, a preferred option was not identified in the Final EIR for the Bicycle Plan. The CP-HPS Phase II Development Plan proposes to provide a bicycle lane in both directions on Innes Avenue between Donahue Street and Hunters Point Boulevard, which would require removal of on-street parking on the south side of Innes Avenue between Earl Street and Hunters Point Boulevard. The Project proposal is consistent with Option 1 in the Bicycle Plan, however, it would not preclude implementation of Option 2 (sharrows added to the existing Class III facility), if that option were determined to be preferable by SFMTA.

Overall, bicycle access and the environment for bicycling would improve within and in the vicinity of the Project site. The facilities would be adequate to meet the bicycling demand associated with the Project uses, and Project impacts on bicycle circulation would be *less than significant*.

However, outside of the project site Bicycle Route #70 and Bicycle Route #170 on Palou Avenue are designated as Class III signed routes, and the combination of the proposed transit preferential treatment and the substantial increase in traffic volumes and congestion would result in potentially significant impacts on bicycle travel on this route. When faced with traffic congestion and constrained environment bicyclists may chose to ride on other streets not designated as part of the bicycle route network. Since the proposed development in Candlestick Point and Hunters Point Shipyard had not been anticipated in the needs assessments conducted for the Bicycle Plan, this segment of Palou Avenue is not included in the Bicycle Plan for near-term or long-term improvement projects.

> ***Project Mitigation Measure 15***: Prior to issuance of the grading permit for Phase I, the Project Applicant shall fund a study to determine the feasibility of relocating Bicycle Routes #70 and #170. The study of the bicycle route relocation, necessary environmental clearance documentation, and implementation shall be the responsibility of SFMTA. Since the feasibility of the relocation of the routes is uncertain at this time, the Project impact on bicycle circulation on Palou Avenue would remain significant and unavoidable.

Because a feasibility study of the relocation of Bicycle Routes #70 and #170 on Palou Avenue would be required, the implementation of Project Mitigation Measure 15 is uncertain, and therefore the Project impact on bicycle circulation would remain *significant and unavoidable.*

Project Variants 1 and 2 include additional development within Hunters Point Shipyard (these variants assume that the 49ers would relocate to Santa Clara and that a new stadium would not be constructed within Hunters Point Shipyard) and would result in increased bicycle travel within and adjacent to the Project area. The bicycle trips associated with the increased development would be accommodated within the proposed street network, and impacts on bicycle circulation would *be less than significant*.

As with the Project, potential significant impacts on bicycle travel on Palou Avenue would occur under both Variants 1 and 2. Project Mitigation Measure 15, described above, would be applicable to both Project Variants 1 and 2. Because a feasibility study of the relocation of Bicycle Routes #70 and #170 on Palou Avenue would be required, the implementation of Project Mitigation Measure 15 is uncertain, and therefore the Project Variants 1 and 2 impacts on bicycle circulation would remain *significant and unavoidable.*

6.3.2 Alternatives to the Project

Alternative 1 – No Project: Under the No Project Alternative, the bicycle route network and bicycle lanes would not be changed from existing conditions, with the exception of the near-term improvements proposed as part of the Bicycle Plan on Cargo Way, Illinois Street, Bayshore Boulevard, Cesar Chavez Street, and on Innes Avenue (see section 4.3.3).

Travel demand associated with Hunters Point Shipyard would increase bicycle travel along Innes Avenue. In the Candlestick Point area, bicycle volumes would remain similar to current conditions, however, increased traffic volumes associated with Hunters Point Shipyard development using the south gate at Crisp Avenue would increase the potential for conflicts between motorists and bicyclists. As with the Project, Alternative 1 impacts on bicycle circulation would be *less than significant.*

Alternative 2 – No Bridge: Street network and bicycle facilities and amenities under Alternative 2 would be similar to the Project. However, the Yosemite Slough bridge would not be constructed. Without the Yosemite Slough bridge, bicycle connectivity between Hunters Point Shipyard and Candlestick Point would occur via the network of existing streets, including Palou Avenue, Ingalls Street, Carroll Avenue and Gilman Avenue. Ingalls Street between Carroll Avenue and Palou Avenue would be designated as a Class III bicycle route, signed with sharrows. While an inconvenience, the lack of the connection provided by the proposed Yosemite Slough bridge would not result in significant impacts on bicycling. As with the Project, Alternative 2 impacts on bicycle circulation would be *less than significant.*

As with the Project, potential significant impacts on bicycle travel on Palou Avenue would occur under Alternative 2. These impacts would be exacerbated somewhat from Project conditions, as Alternative 2 would not include the Yosemite Slough bridge and the direct connection to areas to the southwest of Hunters Point Shipyard.

Project Mitigation Measure 15, described above, would be applicable to Alternative 2. Because a feasibility study of the relocation of Bicycle Routes #70 and #170 on Palou Avenue would be required, the implementation of Project Mitigation Measure 15 is uncertain, and therefore the Alternative 2 impacts on bicycle circulation would remain *significant and unavoidable.*

Alternative 3 – 49ers at Candlestick: Under Alternative 3, the 49ers would remain at Candlestick Park and proposed development would occur primarily in Hunters Point Shipyard. However, within Candlestick Point about 1,210 residential units would be constructed. Bicycle facilities within Hunters Point Shipyard would be similar to the Project, and would be adequate to accommodate the bicycle travel associated with the new development. Alternative 3 would include construction of the Yosemite Slough bridge for the BRT service to Hunters Point Shipyard, and as a pedestrian and bicycle connector. As with the Project, Alternative 3 impacts on bicycle circulation would be *less than significant.*

As with the Project, potential significant impacts on bicycle travel on Palou Avenue would occur under Alternative 3. Project Mitigation Measure 15, described above, would be applicable to Alternative 3. Because a feasibility study of the relocation of Bicycle Routes #70 and #170 on Palou Avenue would be required, the implementation of Project Mitigation Measure 15 is uncertain, and therefore the Alternative 3 impacts on bicycle circulation would remain *significant and unavoidable.*

Alternative 4 – Lesser Build: Alternative 4 assumes a general reduction in development as compared to the Project, and therefore pedestrian travel demand would be less. The proposed street network and bicycle facilities would be similar to Project, however this alternative would not include construction of the Yosemite Slough bridge. As noted above for Alternative 2, without provision of the Yosemite Slough bridge, pedestrian connectivity between Hunters Point Shipyard and Candlestick Point would occur via the network of existing streets, including Palou Avenue, Ingalls Street, Carroll Avenue and Gilman Avenue. Ingalls Street between Carroll Avenue and Palou Avenue would be designated as a Class III facility, signed with sharrows. While an inconvenience, the lack of the connection provided by the proposed Yosemite Slough bridge would not result in significant impacts on bicycling. As with the Project, Alternative 4 impacts on bicycle circulation would be *less than significant.*

As with the Project, potential significant impacts on bicycle travel on Palou Avenue would occur under Alternative 4. These impacts would be exacerbated somewhat from Project conditions, as Alternative 4 would not include the Yosemite Slough bridge and the direct connection to areas to the southwest of Hunters Point Shipyard. Project Mitigation Measure 15, described above, would be applicable to Alternative 4. Because a feasibility study of the relocation of Bicycle Routes #70 and #170 on Palou Avenue would be required, the implementation of Project Mitigation Measure 15 is uncertain, and therefore the Alternative 4 impacts on bicycle circulation would remain *significant and unavoidable.*

Alternative 5 – No Park Agreement: Alternative 5 assumes a similar land use program as the Project Variant 2, and therefore bicycle travel demand would be greater than the Project. The proposed street network and bicycle facilities would be similar to the Project, however, Yosemite Slough bridge would not be constructed. Without the Yosemite Slough bridge, bicycle connectivity between Hunters Point Shipyard and Candlestick Point would occur via the network of existing streets, including Palou Avenue, Ingalls Street, Carroll Avenue and Gilman Avenue. Ingalls Street between Carroll Avenue and Palou Avenue would be designated as a Class III bicycle route, signed with sharrows. While an inconvenience, the lack of the connection provided by the proposed Yosemite Slough bridge would not result in significant impacts on bicycling. As with the Project, Alternative 5 impacts on bicycle circulation would be *less than significant.*

As with the Project, potential significant impacts on bicycle travel on Palou Avenue would occur under Alternative 5. These impacts would be exacerbated somewhat from Project conditions, as Alternative 4 would not include the Yosemite Slough bridge and the direct connection to areas to the southwest of Hunters Point Shipyard. Project Mitigation Measure 15, described above, would be applicable to Alternative 4. Because a feasibility study of the relocation of Bicycle Routes #70 and #170 on Palou Avenue would be required, the implementation of Project Mitigation Measure 15 is uncertain, and therefore the Alternative 4 impacts on bicycle circulation would remain *significant and unavoidable.*

6.4 PEDESTRIAN IMPACTS

6.4.1 Project and Project Variants

The street network proposed for Candlestick Point would be an extension of the existing grid of the adjacent Bayview neighborhood, which would facilitate access between the new uses and the rest of San Francisco, and provide a connection between existing Bayview/South Basin neighborhoods and the existing and proposed waterfront amenities.

Other pedestrian amenities would include: crosswalks at unsignalized intersection, pedestrian crosswalks and signals at all new signalized intersections, corner bulbouts, and completion of sidewalk network where currently incomplete (e.g., Arelious Walker Drive, Palou Avenue). Along Gilman Avenue between Earl Street and Hunters Point Boulevard, and on Palou Avenue and Gilman Avenue between Arelious Walker Drive and Third Street, sidewalks would be reconstructed and landscaping improvements would be implemented.

Sidewalk widths on new or improved streets within the Project site would range from 10-feet to 15-feet in width, with the majority of streets having sidewalks 12 feet or greater in width. The Project would also include new sidewalks, and minor sidewalk narrowing on a number of existing streets, including:

- Griffith Street – narrow east and west sidewalks between Palou Avenue and Thomas Avenue from 12 to 11 feet.
- Thomas Avenue – narrow north and south sidewalks between Griffith Street and Ingalls Street from 15 to 12 feet.
- Ingalls Street – narrow east and west sidewalks between Yosemite Ave and Carroll Ave narrow from 15 to 11 feet.
- Carroll Avenue – new 12 foot wide sidewalks between Ingalls Street and Arelious Walker Drive
- Harney Way – new 15 foot wide sidewalk on north side from Thomas Mellon Drive to Jamestown Avenue

Overall, with the Project, pedestrian access would improve over the No Project conditions, except where sidewalks would be narrowed. The proposed narrowing of sidewalks would still allow for maintenance of sufficient clear space for people using walking aids or wheelchairs, as needed to meet *American with Disabilities* (ADA) requirements. Development of the Project would increase pedestrian presence in the area. Since pedestrian volumes within the Project site are very low, the addition of pedestrian trips associated with the Project would be accommodated within the existing and proposed sidewalk network.

A qualitative assessment was also conducted of potential pedestrian impacts resulting from increased travel demand outside of the Project site. As noted in previous sections, the Project would increase vehicle and bicycle volumes in the Bayview Hunters Point area, which would increase the potential for pedestrian-vehicle and pedestrian-bicycle conflicts particularly in locations where the sidewalk network is incomplete or where vehicles park on sidewalks, causing pedestrians to walk in the roadway and mix with vehicular traffic. The Project-proposed sidewalk network improvements on Innes Avenue, Palou Avenue, Gilman Avenue, and Jamestown Avenue would improve and define the pedestrian network on these roadways. Along Third Street sidewalks have been improved and pedestrian signals and crosswalks were installed as part of the Third Street light rail project. As cumulative development occurs within the area, individual development projects would be required to address any sidewalk deficiencies adjacent to their site.

With the Project, the number of pedestrians on streets outside of the Project site would increase as a result of the expanded recreational uses, extension of transit lines, and overall increase in commercial activity in the area. While the presence of an increased number of pedestrians may partially offset risks associated with increased pedestrian-vehicle and pedestrian-bicycle conflicts, the enhanced pedestrian network and "safety in numbers" conditions due to increased pedestrian presence would cause drivers to expect and adapt to increased interactions with pedestrians.

SFMTA and SFCTA have recognized the existing inadequacies in the Bayview Hunters Point area to the pedestrian network. SFMTA has begun implementing the Bayview Traffic Calming Project, which was developed through a community-based process that identified problem locations with a study area roughly bounded by Jamestown Avenue, Third Street and Evans Avenue, and traffic calming measures. Community concerns included high traffic volumes, numerous trucks, speeding cars, and reckless driving. The study resulted in a list of traffic calming measures (such as gateway islands, speed humps, speed cushions, and traffic circles) along specific roadways. Implementation of improvements is being phased in, and most cost-efficient solutions are being implemented first. The Project improvements would not preclude implementation of the traffic calming measures and would complement the goals of the community to enhance pedestrian safety. SFCTA has recently initiated the Bayview Hunters Point Neighborhood Transportation Plan (NTP) study that is focusing on the existing needs and concerns of the community, to develop smaller-scale solutions that could be implemented in the near-term. Measures such as better bus stops, brighter lighting, and landscaping, as well as parking management and mobility strategies such as shuttle service will be explored with the community.

The San Francisco Department of Public Health (DPH) analyzes pedestrian injuries in traffic accidents from a public health perspective. DPH notes that traffic accidents in general are a leading cause of death and injury in the United States. 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.

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. The Project would result in a substantial change in the street network in the Project site, and includes street improvements that would enhance pedestrian safety in the Project site and beyond. The increased potential for pedestrian-vehicle conflicts and pedestrian injury would be tempered by the "safety in numbers" factor in an area currently characterized by low pedestrian volumes and mix of industrial and residential land uses. Overall, the existing and proposed pedestrian facilities would be adequate to meet the pedestrian demand associated with the Project land uses, and the Project impacts on pedestrian circulation within and in the vicinity of the Project would be *less than significant.*

Project Variants 1 and 2 include additional development within Hunters Point Shipyard (these variants assume that the 49ers would relocate to Santa Clara and that a new stadium would not be constructed within Hunters Point Shipyard) and would result in increased pedestrian travel within and adjacent to the Project area. The pedestrian trips associated with the increased development would be accommodated within the proposed sidewalk network, and impacts on pedestrian circulation would *be less than significant*.

6.4.2 Alternatives to the Project

Alternative 1 – No Project: Under the No Project Alternative, sidewalks in the study area would not be changed, with the exception of any street network improvements within Hunters Point Shipyard. Travel demand associated with Hunters Point Shipyard would increase pedestrian travel between Innes Avenue and Third Street, which would be accommodated on the 7-foot to 10-foot wide sidewalks on Innes Avenue, Hunters Point Boulevard, and Evans Avenue.

In the Candlestick Point area, pedestrian volumes would remain similar to current conditions, however, increased traffic volumes associated with Hunters Point Shipyard development using the south gate at Crisp Avenue would increase the potential for conflicts between motorists and pedestrians, particularly on streets in the South Basin where vehicles frequently park on sidewalks, and where there are no sidewalks. As with the Project, Alternative 1 impacts on pedestrian circulation would be *less than significant.*

Alternative 2 – No Bridge: Street network and pedestrian facilities and amenities under Alternative 2 would be similar to the Project, with the exception of the Yosemite Slough bridge, which would not be constructed. Pedestrian connectivity between Hunters Point Shipyard and Candlestick Point would occur via the network of existing streets, including Palou Avenue, Ingalls Street, Griffith Street, Carroll Avenue and Gilman Avenue. In addition, some pedestrians may walk along the Bay Trail. While an inconvenience, the lack of the connection provided by the proposed Yosemite Slough bridge would not result in significant impacts on pedestrian operations. As with the Project, Alternative 2 impacts on pedestrian circulation would be *less than significant.*

Alternative 3 – 49ers at Candlestick: Under Alternative 3, the 49ers would remain at Candlestick Park and proposed development would occur primarily in Hunters Point Shipyard. However, within Candlestick Point about 1,210 residential units would be constructed. Pedestrian facilities within Hunters Point Shipyard would be similar to the Project, and would be adequate to accommodate the pedestrian travel associated with the new development. Alternative 3 would include construction of the Yosemite Slough bridge for the BRT service to Hunters Point Shipyard, and as a pedestrian and bicycle connector. As with the Project, Alternative 3 impacts on pedestrian circulation would be *less than significant.*

Alternative 4 – Lesser Build: Alternative 4 assumes a general reduction in development as compared to the Project, and therefore pedestrian travel demand would be less. The proposed street network and pedestrian facilities would be similar to Project, however this alternative would not include construction of the Yosemite Slough bridge. As noted above for Alternative 2, without provision of the Yosemite Slough bridge, pedestrian connectivity between Hunters Point Shipyard and Candlestick Point would occur via the network of existing streets, including Palou Avenue, Ingalls Street, Griffith Street, Carroll Avenue and Gilman Avenue. In addition, some pedestrians may walk along the Bay Trail. While an inconvenience, the lack of the connection provided by the proposed Yosemite Slough bridge would not result in significant impacts on pedestrian operations. As with the Project, Alternative 4 impacts on pedestrian circulation would be *less than significant.*

Alternative 5 – No Park Agreement: Alternative 5 assumes a similar land use program as the Project Variant 2 (1,350 residential units more than the Project within Hunters Point Shipyard), and therefore pedestrian travel demand would be greater. The proposed street network and pedestrian facilities would be similar to Project, however this alternative would not include construction of the Yosemite Slough bridge. As noted above for Alternative 2, without provision of the Yosemite Slough bridge, pedestrian connectivity between Hunters Point Shipyard and Candlestick Point would occur via the network of existing streets, including Palou Avenue, Ingalls Street, Griffith Street, Carroll Avenue and Gilman Avenue. In addition, some pedestrians may walk along the Bay Trail. While an inconvenience, the lack of the connection provided by the proposed Yosemite Slough bridge would not result in significant impacts on pedestrian operations. As with the Project, Alternative 5 impacts on pedestrian circulation would be *less than significant.*

6.5 PARKING IMPACTS

Parking impacts assessment associated with the Project, Variants, and Alternatives include the comparison of the parking demand to the maximum off-street parking permitted per the parking standards detailed in the draft D4D standards for CP-HPS Phase II Development Plan. Since maximum permitted parking controls are proposed for the project site (not minimum requirements), a discussion is also presented for conditions if no off-street parking is provided. In addition, the impact of the Project relative to on-street parking supply on existing and proposed roadways is discussed.

The parking demand calculations represent the number of spaces that would be required in order to accommodate all the vehicles anticipated to result from the Project if the proposed parking supply was unconstrained. Since the parking supply would be constrained, the actual parking demand would be expected to be less. Transportation Study Appendix J includes the parking demand calculations, and provides a summary by residential and non-residential/commercial uses.

As part of its "transit first" policy, the City and County of San Francisco does not require that the supply of parking spaces equal the demand. Consequently, even though it is anticipated that the maximum number of parking spaces permitted per the D4D standards would be provided, they may not be sufficient to accommodate the actual demand. If fewer spaces than the maximum permitted were to be constructed, the projected shortfall would increase. Therefore, individuals who would prefer to drive may use transit because the perceived convenience of driving is lessened by a shortage of parking. This shortage in proposed off-street parking is not considered a significant environmental effect because it implements a policy intended to reduce citywide traffic congestion and air quality effects. Even with a shortage of off-street parking, measures often are implemented that result in more efficient use of the parking spaces provided. By promoting carpooling, allowing for the shared use of parking, and implementing pricing strategies designed to encourage short-term parking, the spaces provided for non-residential use would likely be used by more individuals, be vacant for shorter periods of time, and attract drivers needing short-term parking.

6.5.1 Project and Project Variants

Table 84 summarizes the aggregate of the parking demand calculated for Project land uses, and also presents the maximum permitted parking supply per the parking standards detailed in the draft D4D standards as well as the proposed number of new on-street parking spaces that would be provided on new and reconfigured streets.[20] **Table 85** summarizes the parking demand, and

[20] The Project would include some on-street parking in the project site for both commercial and general/residential uses. About 683 on-street spaces would be provided within Hunters Point Shipyard and 1,360 spaces within Candlestick Point for a total of 2,043 spaces.

the resultant parking shortfalls assuming Project parking supply for two scenarios: based on the maximum permitted draft D4D standards; and, assuming provision of no off-street spaces but that only the on-street parking spaces would be available. Since the D4D standards do not include minimum requirements (instead specify the maximum parking supply that would be permitted to be provided) it is possible that the Project could be constructed without any off-street parking. However, most development projects in San Francisco develop the maximum permitted supply, and therefore the comparison of the parking demand to the maximum permitted off-street supply and to no off-street supply presents the range of potential parking impacts.

Table 84
Summary of Parking Demand and Maximum Permitted Supply
Project and Project Variants

Scenario/Project Component	Demand [1]				Supply [1]		
	Residential	Non-Residential		Total Demand	Maximum Permitted Off-Street [2]	New On-Street	Total Supply
	Long Term	Long Term	Short Term				
Project							
Hunters Point Shipyard	3,110	3,818	996	7,924	6,678	683	7,361
Candlestick Point	9,212	1,475	2,622	13,309	10,196	1,360	11,556
Total	*12,322*	*5,293*	*3,618*	*21,233*	*16,874*	*2,043*	*18,917*
Variant 1 (R&D)							
Hunters Point Shipyard	3,110	7,299	1,447	11,856	9,678	1,678	11,356
Candlestick Point	9,212	1,475	2,622	13,309	10,196	1,360	11,556
Total	*12,322*	*8,774*	*4,069*	*25,165*	*19,874*	*3,038*	*22,912*
Variant 2 (Housing)							
Hunters Point Shipyard	4,694	3,811	911	9,416	7,778	1,298	9,076
Candlestick Point	7,627	1,480	2,787	11,894	8,846	1,360	10,206
Total	*13,321*	*5,291*	*3,698*	*21,310*	*16,624*	*2,658*	*19,282*

Notes:
1. Does not include stadium parking supply or game day demand.
2. Maximum number of spaces permitted per draft Design for Development standard for Candlestick Point Hunters Point Shipyard Phase II Development Plan.
Source: CHS Consulting, LCW Consulting.

Table 85
Summary of Parking Shortfalls for No Minimum and Maximum Permitted Supply [1, 2]
Project and Project Variants

Scenario/Project Component	Total Demand	Minimum Supply		Maximum Supply	
		Supply	Shortfall	Supply	Shortfall
Project					
Hunters Point Shipyard	7,924	683	- 7,241	7,361	- 563
Candlestick Point	13,309	1,360	- 11,949	11,556	- 1,753
Total	*21,233*	*2,043*	*- 19,190*	*18,917*	*- 2,316*
Variant 1 (R&D)					
Hunters Point Shipyard	11,856	1,678	- 10,178	11,356	- 500
Candlestick Point	13,309	1,360	- 11,949	11,556	- 1,753
Total	*25,165*	*3,038*	*- 22,127*	*22,912*	*- 2,253*
Variant 2 (Housing)					
Hunters Point Shipyard	9,416	1,298	- 8,118	9,076	- 340
Candlestick Point	11,894	1,360	- 10 534	10,206	- 1,688
Total	*21,310*	*2,658*	*- 18,652*	*19,282*	*- 2,028*

Notes:
1. Includes off-street and new on-street supply.
2. Does not include stadium parking supply or demand.
Source: CHS Consulting, LCW Consulting.

As shown in **Table 84**, the demand analysis indicates a Project need for about 21,233 spaces, compared with a maximum permitted supply of about 18,917 spaces; therefore the maximum off-street parking supply would be approximately 2,316 spaces less than the estimated peak demand. Residential spaces would comprise approximately 79 percent of the total shortfall spaces, and non-residential commercial spaces the remaining 21 percent of the shortfall:

- The residential parking demand of 12,322 spaces, compared to a maximum permitted of 10,500 spaces (one space per unit), would result in a deficit of 1,822 spaces demand).
- The non-residential demand would be 8,911 spaces, of which 41 percent would be needed for short-term use, while the remaining 59 percent would be needed for long-term use. The non-residential commercial parking demand, compared with a maximum permitted number of about 8,417 spaces, would result in a deficit of 494 spaces.

If no off-street parking is provided, the parking shortfall associated with the Project would increase substantially, and there would be a deficit of about 19,190 spaces. As indicated above, this represents the maximum shortfall, as it is anticipated that most, if not all, maximum permitted parking would likely be constructed.

Due to parking supply constraints and accessibility to transit, future Project parking demand may be somewhat lower than estimated, and therefore the parking space shortfall would also be less than presented above in **Table 85.** Specifically:

- The parking demand estimates included in **Table 84** and **Table 85** represent the number of spaces that would be required in order to accommodate all the vehicles anticipated to result from the Project if the proposed parking supply was unconstrained. Since the parking supply would be constrained, the actual parking demand would be expected to be less.
- The parking demand estimates represent the peak parking demand calculated separately for each land use. Since all land uses do not experience the peak parking demands simultaneously, the peak parking demand may be less than presented. The Project-proposed parking ratios are generally less than the existing Planning Code requirement for similar uses to discourage auto use and to reflect the potential for shared parking opportunities among the various uses. For example, a restaurant can share parking with an office complex, since restaurant parking demand peaks in the evening, while office parking demand peaks during the middle of the day. Public parking facilities, such as the one proposed in Candlestick Point, and on-street parking spaces can usually be shared efficiently among many destinations. Accounting for the shared parking would reduce the non-residential parking demand, and the excess demand that would not be accommodated within the proposed parking supply would also be less.
- The Project includes a Travel Demand Management program that includes a number of parking strategies to make auto use and ownership less attractive, as well as strategies to encourage alternative modes. While the TDM program was assumed in developing Project travel demand, the residential parking demand was based on standard *SF Guidelines* parking demand rates that are based on Citywide averages.
- Residents within Hunters Point Shipyard and Candlestick Point would have new and improved existing transit routes connecting the Project site with downtown and with Caltrain and BART. Under Project conditions, capacity on local and regional lines would be available to accommodate additional Project transit trips.

As part of its "transit first" policy, the City and County of San Francisco does not require that the supply of parking spaces equals the demand. Consequently, even though it is anticipated that the Project would provide the maximum number of parking spaces permitted, they may not be sufficient to accommodate the actual demand. If fewer spaces than the maximum permitted were to be constructed, the projected shortfall would increase. Therefore, individuals who would prefer to drive may use transit because the perceived convenience of driving is lessened by a shortage of parking. This shortage is not considered a significant environmental effect because it implements a policy intended to reduce citywide traffic congestion and air quality effects. Even with a shortage of off-street parking, measures often are implemented that result in more efficient use of the parking spaces provided. By promoting carpooling, allowing for the shared use of parking, and implementing pricing strategies designed to encourage short-term parking, the spaces provided for non-residential use would likely be used by more individuals, be vacant for shorter periods of time, and attract drivers needing short-term parking.

Since the proposed parking supply in the Project site would not meet demand, it is possible that some drivers may seek available parking in adjacent Bayview residential areas to the west. The potential increase in parking demand in adjacent neighborhoods would likely spill over to streets with existing industrial uses in the Project vicinity, which could, in turn, increase demand for parking in nearby Bayview residential areas. Residential streets near the Project site do not currently have parking restrictions and are about 70 percent occupied during the weekday midday and evening periods. Commercial and industrial spillover into residential areas is not expected to be a substantial problem because parking demand in residential areas in Bayview would be highest at night, when the commercial and industrial parking demand is lowest. If parking demand is found to exceed supply in the Bayview residential area, the City's residential parking permit program could be introduced to the area to help ensure availability of parking for local residents. The extent of spillover into the nearby industrial and residential neighborhoods to the west would be limited by the existing topography (e.g., steep grades due to the Bayview Hill), the distance between the Project site and available parking supply, and concerns related to safety in the industrial area. Transit service with available capacity and on-site carsharing services would provide an alternative to seeking parking supply further afield.

On days when events were scheduled at the stadium, parking spaces in the Bayview and Candlestick Point area would be in great demand. Those arriving to the Project vicinity on weekends after drivers have started arriving for the stadium event would have difficulty parking on event days unless they have already-reserve parking, such as spaces allocated to residential units.

Additionally, no cumulative parking impacts are expected. Other cumulative projects in the area, such as most of the surrounding existing development, Executive Park, and India Basin, are located too far from the Project site to expect that drivers going to other projects would seek parking on the Project site, or that drivers going to the Project site would park far outside the Project boundaries. Additionally, in some areas, the topography is not conducive to parking beyond the Project site boundaries. Consequently, there is no potential for significant cumulative parking impacts.

As noted above, in San Francisco, parking supply is not considered a permanent physical condition, and changes in the parking supply would not be a significant environmental impact under CEQA, but rather a social effect. The loss of parking may cause potential social effects, which would include cars circling and looking for a parking space in neighboring streets. The secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to some drivers, who are aware of constrained parking conditions in a given area, shifting to other modes. Hence, any secondary environmental impacts that may result from a shortfall in parking would be minor. Therefore, the parking shortfall would not result in significant parking impacts, and Project impacts on parking would be *less than significant.*

Loss of On-Street Parking - Some existing parking spaces would also be lost because of Project changes to the existing roadway configuration. The bus transit preferential treatments and streetscape improvements on Palou Avenue between Third Street and Griffith Street would result in a net loss of approximately 60 parking spaces (about 40 spaces due to bus stop improvements and corner bulbouts, and 20 spaces on the north side of the street between Ingalls and Griffith Streets where vehicles park perpendicular off-street within the sidewalk right-of-way. In addition, on the following streets a total of about 77 on-street parking spaces would be displaced:

- Carroll Avenue between Hawes and Ingalls Streets – 26-spaces.
- Innes Avenue between Earl Street and Hunters Point Boulevard – 51-spaces.

Project intersection improvements and mitigation measures would require removal of some on-street parking at the approaches to intersections. These on-street losses include:

- Evans/Jenning/Middlepoint – 8 to 10 spaces on the west side of Jennings Street at the southbound approach to Evans.
- Palou/Griffith/Crisp – 8 to 10 spaces on the east side of Griffith Street at the northbound approach.
- Carroll/Ingalls – 8 to 10 spaces on the west side of Ingalls Street at the southbound approach.
- Blanken/Tunnel – 13 spaces on the east side of Tunnel Avenue at the northbound and southbound approaches.

Project mitigation measures related to transit improvements would also result in peak period parking prohibitions. At some locations, such as on Third Street and Paul Avenue, parking spaces would be eliminated.

- San Bruno Avenue – 5 spaces on the east side of San Bruno Avenue south of Silver Avenue, and 20 spaces on the west side of San Bruno Avenue between Woolsey Street and Olmstead Street.
- Palou Avenue – about 140 spaces on the north side and 130 spaces on the south side of Palou Avenue between Newhall Street and Crisp Avenue.
- Gilman Avenue – about 90 spaces on the north side and 80 spaces on the south side of Gilman Avenue between Arelious Walker Drive and Third Street.
- Paul Avenue – about 40 parking spaces on the north side of Paul Avenue between Third Street and Bayshore Boulevard.
- Third Street – about 110 spaces on the east and west curbs of Third Street between Thomas Avenue and Kirkwood Avenue.

The parking demand that would be displaced due to the temporary and permanent parking losses would be accommodated on other streets in the study area. At some locations, residents and visitors to commercial establishments would have to walk further between their parking space and destination, or switch to transit or other modes. The impact related to parking supply would be *less than significant.*

Project Variant 1 (R&D) and Variant 2 (Housing)

Under Project Variants 1 and 2, it is assumed that the 49ers relocate to Santa Clara and that a new stadium would not be constructed within Hunters Point Shipyard. Under Project Variant 1 the amount of research and development space within Hunters Point Shipyard would increase by 2,500,000 square feet from the Project. As indicated in **Table 81**, Project Variant 1 would result in a need for about 25,165 spaces, compared with a maximum supply of about 22,912 spaces; therefore the maximum off-street parking supply would be approximately 2,253 spaces less than the estimated peak demand. More on-street parking spaces would be provided under Variant 1 than the Project, and thus the overall parking shortfall for Variant 1 would be slightly less than for the Project. As with the Project, Project Variant 1 would not significantly impact parking conditions.

The development program for Variant 2 would be similar to the Project, however, about 1,350 residential units would be shifted from Candlestick Point to Hunters Point Shipyard. Parking impacts would be similar to the Project. Compared with a maximum supply of about 19,282 spaces, the parking demand of 21,310 spaces would result in an excess demand of 2,028 spaces. As with the Project, Variant 2 would not significantly impact parking conditions.

As indicated in **Table 82,** if no off-street parking is developed, the parking shortfall would be substantially greater than if the maximum permitted supply is provided. The parking shortfall would be 22,127 spaces for Variant 1, and 18,652 spaces for Variant 2. As noted above, if no parking is provided, drivers may park outside of the project area, or may switch to transit, carpool, bicycle or other modes of travel. Due to parking shortfalls, there may be impacts to pedestrians, bicycles and transit caused by parking on the sidewalks, double-parking, and parking at intersections or other illegal parking activities. However, parking impacts for Project Variant 1 and Project Variant 2 would be *less than significant*.

6.5.2 Alternatives to the Project

Table 86 summarizes the aggregate of the parking demand calculated for the land uses assumed for the project Alternatives and presents the parking supply for the maximum allowable per the parking standards detailed in the draft D4D standards for the Candlestick Point HPS II Development Program and the anticipated number of new on-street spaces that would be provided. **Table 87** summarizes the parking demand, and the resultant parking shortfalls assuming two scenarios: Alternative parking supply based on the maximum permitted draft D4D standards, and assuming provision of no off-street spaces.

Table 86
Summary of Parking Demand and Maximum Permitted Supply [1, 2]
Alternatives to the Project

Alternative/Project Area	Demand				Supply		
	Residential	Non-Residential		Total Demand	Maximum Permitted Off-Street [1]	New On-Street	Total Supply
	Long Term	Long Term	Short Term				
Alt. 1 - No Project							
Hunters Point Shipyard	2,122	3,929	3,107	9,148	6,727	683	7,410
Candlestick Point	--	--	--	--	--	--	0
Total	*2,122*	*3,929*	*3,107*	*9,148*	*6,727*	*683*	*7,410*
Alt. 2 - No Bridge							
Hunters Point Shipyard	3,110	3,818	996	7,924	6,678	683	7,361
Candlestick Point	9,212	1,475	2,622	13,309	10,196	1,360	11,556
Total	*12,322*	*5,293*	*3,618*	*21,233*	*16,874*	*2 043*	*18,917*
Alt. 3 - 49ers at Candlestick							
Hunters Point Shipyard	4,694	3,810	911	9,415	7,778	1,298	9,076
Candlestick Point	1,420	--	--	1,420	1,210	280	1,490
Total	*6,114*	*3,810*	*911*	*10,835*	*8,988*	*1,578*	*10,566*
Alt. 4 - Lesser Build							
Hunters Point Shipyard	2,177	2,717	808	5,702	5,770	683	6,453
Candlestick Point	7,627	1,062	2,355	11,044	7,272	1,460	8,732
Total	*9,804*	*3,779*	*3,163*	*16,746*	*13,042*	*2,043*	*15,185*
Alt. 5 - No Park Agreement							
Hunters Point Shipyard	4,694	3,811	911	9,416	7,778	1,298	9,076
Candlestick Point	7,627	1,480	2,787	11,894	8,846	1,265	10,111
Total	*12,321*	*5,291*	*3,698*	*21,310*	*16,624*	*2,563*	*19,187*

Notes:
1. Maximum number of spaces permitted per draft Design for Development standard for Candlestick Point Hunters Point Shipyard II Development Plan.
2. Does not include stadium parking demand or supply.
Source: CHS Consulting, LCW Consulting.

Table 87
Summary of Parking Shortfalls for No Minimum and Maximum Permitted Supply [1] Alternatives to the Project

Scenario/Project Area	Total Demand	Minimum Supply		Maximum Supply	
		Supply	Shortfall	Supply	Shortfall [1]
Alt. 1 - No Project					
Hunters Point Shipyard	9,148	683	- 8,465	7,410	- 1,738
Candlestick Point	--	0	--	--	0
Total	*9,148*	*683*	*- 8,465*	*7,410*	*- 1,738*
Alt. 2 – No Bridge [2]					
Hunters Point Shipyard	7,924	683	- 7,941	7,361	- 563
Candlestick Point	13,309	1,360	- 11,949	11,556	- 1,753
Total	*21,233*	*2,043*	*- 19,190*	*18,917*	*- 2,316*
Alt. 3 – 49ers at Candlestick					
Hunters Point Shipyard	9,415	1,298	- 8,117	9,076	- 339
Candlestick Point	1,420	280	- 1,140	1,490	70
Total	*10,835*	*1,578*	*- 9,257*	*10,566*	- 269
Alt. 4 – Lesser Build					
Hunters Point Shipyard	5,702	683	- 5,019	6,453	751
Candlestick Point	11,044	1,360	- 9,684	8,732	- 2,412
Total	*16,746*	*2,043*	*- 14,703*	*15,185*	- 1,661
Alt. 5 – Park Agreement					
Hunters Point Shipyard	9,416	1,298	- 8,118	9,076	- 340
Candlestick Point	11,894	1,265	- 10,629	10,111	- 1,783
Total	*21,310*	*2,563*	*- 18,747*	*19,187*	- 2,123

Notes:
1. Includes off-street and new on-street supply.
2. Does not include stadium parking demand or supply.
Source: CHS Consulting, LCW Consulting.

Alternative 1 – No Project: Alternative 1 assumes buildout of Hunters Point Shipyard Phase II per the Hunters Point Shipyard Redevelopment Plan and EIR (February 2000) and subsequent addendums dated November 19, 2003 and July 13, 2006. As indicated in **Table 86,** the demand analysis indicates for the Project a need for about 9,148 spaces, compared with a permitted supply of about 7,410 off-street and on-street spaces; therefore the maximum supply would be approximately 1,738 spaces less than the estimated peak demand. As for the Project, Alternative 1 impacts on parking conditions would be *less than significant*.

Alternative 2 – No Bridge: The Alternative 2 development program is the same as the Project; however, Alternative 2 would not include construction of the Yosemite Slough bridge. Therefore, the parking demand and supply analysis would be the same as for the Project, yielding an overall deficit of about 2,316 spaces. As indicated on **Table 87**, if no off-street parking is developed, the parking shortfall would be substantially greater (19,190-space shortfall) than if the maximum permitted supply is provided. As for the Project, Alternative 2 impacts on parking conditions would be *less than significant*.

Alternative 3 – 49ers at Candlestick: Construction activities associated with Alternative 3 would be less than for the Project. Within Candlestick Point the existing stadium would remain, and only 1,210 residential units would be constructed. Alternative 3 would result in a demand of about 10,835 spaces, and compared with a maximum supply of 10,566 spaces, would result in an excess demand of about 269 spaces. As indicated on **Table 87**, if no off-street parking is developed, the parking shortfall would be substantially greater (9,257-space shortfall) than if the maximum permitted supply is provided. Therefore, overall parking impacts would be less than identified for the Project. As for the Project, Alternative 3 impacts on parking conditions would be *less than significant*.

Alternative 4 – Lesser Build: Alternative 4 assumes a general reduction in development as compared to the Project (approximately a 30 percent reduction), and therefore associated parking demand and supply would be less than the Project. The demand analysis for Alternative 4 indicates a need for about 16,746 spaces, compared with a maximum supply of about 15,185 spaces; therefore the maximum parking supply would be approximately 1,661 spaces less than the estimated peak demand. As indicated on **Table 87,** if no off-street parking is developed, the parking shortfall would be substantially greater (14,703-space shortfall) than if the maximum permitted supply is provided. As for the Project, Alternative 4 impacts on parking conditions would be *less than significant*.

Alternative 5 – No Park Agreement: The Alternative 5 development program is similar to Project Variant 2. As shown in **Table 86**, Alternative 5 would result in a need for about 21,310 spaces, and compared with a maximum supply of about 19,187 spaces would result in an excess demand of 2,123 spaces. As indicated on **Table 87**, if no off-street parking is developed, the parking shortfall would be substantially greater (18,747-space shortfall) than if the maximum permitted supply is provided. As for the Project, Alternative 5 impacts on parking conditions would be *less than significant*.

6.6 LOADING IMPACTS

Loading impacts assessment associated with the Project, Variants, and Alternatives include the comparison of the demand for loading spaces to the number of loading spaces permitted per the loading standards detailed in the draft D4D standards for the Candlestick Point HPS II Development Program. The loading standards incorporated into the Candlestick Point Hunters Point II draft D4D standards would be the same as the San Francisco Planning Code standards. As indicated in section 4.2.6, the demand for loading spaces was estimated based on the development program and the daily truck trip generation rates for 1,000 gross square feet of use, then converted to hourly demand.

In general, if loading demand is not met on site and could not be accommodated within on-street loading zones, trucks could temporarily double-park and partially block local streets while loading and unloading goods which could result in disruptions and impacts to traffic and transit operations, as well as to bicyclists and pedestrians. Because any effects of unmet loading demand would be temporary inconveniences, any excess demand would not be a significant impact. The Project Design for Development standards establish a minimum number of loading spaces; more could be provided as part of individual development projects.

As noted in section 2.8, approximately 300 feet of curb space on the Stadium Outer Ring Road would be designated for truck parking. The parking areas would have 17-foot wide parking lanes which would fully accommodate wider trucks without impeding on adjacent bicycle or travel lanes. This designated truck parking area would meet the needs of truck drivers to take a ten-hour rest period that is governed by federal and state safety rules, and to stage when off-street loading facilities are not ready to accommodate deliveries. The designation of this on-street parking area would reduce the potential for truck drivers to seek long-term parking on residential streets in the project site and within the Bayview/South Basin area.

Stadium loading supply and demand is discussed in section 6.8.

6.6.1 Project and Project Variants

Table 88 summarizes the estimate of daily truck trips generated by the proposed land uses and the associated demand for loading dock spaces during the peak hour of loading activities (which generally occurs between 10:00 a.m. and 1:00 p.m.), and the estimated supply that would be provided per draft Design for Development. For the Project and Project Variant 2, the estimated loading supply would be greater than the loading demand during the peak hour of loading operations. Within the Hunters Point Shipyard the loading demand and estimated supply would be similar, while within Candlestick Point the supply would substantially exceed the demand. This is due primarily to the calculation for retail uses, which has the most intensive loading demand. For the regional retail uses within Candlestick Point, loading facilities would be located to meet multiple tenants within the retail development. For Project Variant 2, the loading demand within Hunters Point Shipyard would not be met within the on-site supply, and therefore, as noted above, would need to be accommodated on-street, which may result in temporary disruptions to traffic and transit operations, as well as to pedestrians and bicyclists. Overall, Project and Project Variants 1 and 2 impacts related to loading operations would be *less than significant.*

Table 88
Summary of Loading Demand and Supply
Project and Project Variants

Scenario/Project Area	Daily Truck Generation	Peak Hour Loading Dock Space Demand	Supply [1, 2,]
Project			
Hunters Point Shipyard	713	41	42
Candlestick Point	507	29	59
Total	*1,220*	*70*	*101*
Project – Variant 1 (R&D)			
Hunters Point Shipyard	1,238	72	67
Candlestick Point	507	29	59
Total	*1,745*	*101*	*126*
Project – Variant 2 (Housing)			
Hunters Point Shipyard	766	44	47
Candlestick Point	458	27	55
Total	*1,224*	*71*	*102*

Notes:
1. Minimum number of loading spaces permitted per draft Design for Development standard for the CP-HPS Phase II Development Plan.
2. Does not include stadium loading facilities.
Source: LCW Consulting.

6.6.2 Alternatives to the Project

Table 89 summarizes the estimate of daily truck trips, demand for loading dock spaces during the peak hour of loading activities, and the estimated supply for the Alternatives to the Project that would be provided per draft D4D standards.

Alternative 1 – No Project: Alternative 1 assumes buildout of Hunters Point Shipyard Phase II per the Hunters Point Shipyard Redevelopment Plan. As indicated in **Table 89,** the loading demand analysis indicates a demand for Hunters Point Shipyard of about 52 spaces, compared with a supply of about 36 spaces; therefore the off-street loading supply would be approximately 16 spaces less than the estimated peak demand. The excess loading demand could be met within on-street loading zones, or if not provided, trucks could temporarily double-park and partially block local streets while loading and unloading goods which could result in disruptions and impacts to traffic and transit operations, as well as to bicyclists and pedestrians. Because any effects of unmet loading demand would be temporary inconveniences, any excess demand would not result in a significant impact. The Redevelopment Plan design document used to calculate expected loading supply establishes a minimum number of loading spaces; more could be provided as part of individual development proposals. As for the Project, Alternative 1 impacts on loading conditions would be *less than significant*.

Table 89
Summary of Loading Demand and Supply
Alternatives to the Project

Alternative/Project Area	Daily Truck Generation	Peak Hour Loading Dock Space Demand	Supply [1, 2, 3]
Alt. 1 - No Project			
Hunters Point Shipyard	891	52	36
Candlestick Point	0	0	0
Total	*891*	*52*	*36*
Alt. 2 – Project - No Bridge			
Hunters Point Shipyard	713	41	42
Candlestick Point	507	29	59
Total	*1,220*	*70*	*101*
Alt. 3 – 49ers at Candlestick			
Hunters Point Shipyard	766	44	47
Candlestick Point	53	3	6
Total	*819*	*47*	*53*
Alt. 4 – Lesser Build			
Hunters Point Shipyard	518	30	31
Candlestick Point	358	21	42
Total	*876*	*51*	*73*
Alt. 5 – No Park Agreement			
Hunters Point Shipyard	766	44	47
Candlestick Point	458	27	55
Total	*1,224*	*71*	*102*

Notes:
1. Minimum number of loading spaces permitted per draft Design for Development standard for CP-HPS Phase II Development Plan.
2. Does not include stadium loading facilities.
3. Loading spaces for No Project conditions based on existing Design for Development standards for Hunters Point Shipyard Redevelopment Project.
Source: LCW Consulting .

Alternatives 2 through 5: For Alternative 2 (No Bridge), Alternative 3 (49ers at Candlestick), Alternative 4 (Lesser Build) and Alternative 5 (No Park Agreement) the estimated loading supply calculated per D4D standards would be greater than the loading demand during the peak hour of loading operations. Similar to the Project, the estimated supply within the Candlestick Point area would substantially exceed the demand. Alternative 2 through Alternative 5 impacts related to loading operations would be *less than significant.*

6.7 EMERGENCY VEHICLE ACCESS IMPACTS

The Project includes the construction of new roadways to facilitate emergency access. Existing emergency response routes would either be maintained in their existing locations or rerouted as necessary. Further, all development would be designed in accordance with City standards, which include provisions that address emergency access (e.g., minimum street widths, minimum turning radii). In addition, emergency vehicles would be able to utilize transit lanes when streets are congested. Therefore, Project impacts on emergency access would be less than significant.

Emergency vehicle access impacts under Project Variants 1 and 2, and Alternatives 1 through 5 would be similar to the Project; impacts on emergency access would be *less than significant.*

6.8 AIR TRAFFIC IMPACTS

The Project site is not near an airfield; San Francisco International Airport is about seven miles to the south. This distance is outside of the limit for objects near airports in the guidance published by the Federal Aviation Administration (FAA) (within 20,000 feet or less than 4 miles from an airport). The FAA requires notice of construction for any structures within 20,000 feet what would extend 200 feet above ground level.[21] The proposed height of the tallest buildings (420 feet) would be approximately 30 feet higher than the crest of the adjacent Bayview Hill (which reaches an elevation of about 390 feet). The Project applicant will notify FAA prior to construction of buildings exceeding 200 feet to ensure compliance with FAA requirements. For those reasons, the heights of the Project buildings would not interfere with or result in any changes to air traffic. Therefore, Project impacts on air traffic safety would be *less than significant*.

Air traffic impacts under Project Variants 1 and 2, and Alternatives 1 through 5 would be similar to the Project; impacts on air traffic safety would be *less than significant.*

6.9 HAZARDS DUE TO DESIGN FEATURES

The Project includes construction of new roadways within the Project site, the construction of the Yosemite Slough bridge, and streetscape and intersection improvements outside of the Project site. New and reconfigured roadways would be designed in accordance with City standards, and would need to be reviewed and approved by the City prior to construction. Therefore, Project impacts related to hazards would be *less than significant*.

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[21] Federal Aviation Administration, Advisory Circular AC 70/7460-2K, Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace, March 1, 2000, available at http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/22990146db0931f186256c2a00721867/$FILE/ac70-7460-2K.pdf, accessed October 28, 2008.

Impacts related to hazards under Project Variants 1 and 2, and Alternatives 1 through 5 would be similar to the Project; *less than significant.*

6.10 CONSTRUCTION IMPACTS

6.10.1 Project and Project Variants

Buildout of the Project would occur over a 20-year period between 2010 and 2029. Initial construction activities would include demolition of existing structures, utility relocation and site clearance and grading at Hunters Point Shipyard to make the land available for the new stadium. The new stadium and the Yosemite Slough bridge are anticipated to be completed by 2017 in time for the 2017 football season.

Buildout of the project would occur over about a 20-year period as part of four overlapping phases (see **Table 2** for development phasing). The duration of each phase would vary, depending on the type of development (e.g., residential, retail, office) and the amount of building space included in each phase. The majority of development would occur and be occupied by the end of the second phase, which has a scheduled completion date of 2021. The majority of the roadway network improvements would occur by 2017 (Phase I), and most transit improvements would be phased in by 2021 (within Phase I and Phase II). Construction impacts within the Project site would affect new residents, employees, and visitors to the area. Overall, throughout the construction period the addition of worker-related vehicles and transit trips would be less than those associated with Project conditions at full buildout.

During construction of the Project phases, building activities would generate traffic volumes from construction workers, truck deliveries of supplies and construction equipment, and the hauling of soils during Project grading and excavation. **Table 90** presents the phases for the Hunters Point Shipyard and Candlestick Point development, the number of construction workers that would be on-site on a daily basis, as well as the maximum number of construction truck trips that would travel to and from the sites on a daily basis. These truck trip estimates assume that approximately 40 percent of the required import fill materials would be brought onto the site via barge, with the remaining arriving by truck. **Table 91** presents the number of daily construction truck trips and construction workers, as well as the annual number of barge trips associated with improvements to the shoreline at both Hunters Point Shipyard and Candlestick Point.

The peak phases of construction activities would occur between 2012 and 2016, when grading and infrastructure improvements would be ongoing at both Candlestick Point and Hunters Point Shipyard. During this phase, there would be between 50 and 180 construction workers that would be on-site on a daily basis, and between 140 and 570 construction truck trips that would travel to and from the site on a daily basis. These truck trip estimates assume that about 40 percent of the required import fill materials would be brought onto the site via barge, with the remaining arriving by truck.

Table 90
Construction Workers and Trucks by Phase
Hunters Point Shipyard and Candlestick Point

Project Area/Construction Phase	Construction Duration	Daily Construction Workers	Daily Construction Truck Trips
Hunters Point Shipyard			
Phase 1 – Site Preparation [1]			
Abatement & Demolition	2010 – 2015	10-50	8-48
Grading and Infrastructure	2012 - 2016	30-145	128-424
Phase 1 – Building Construction [1]			
Structure/Rough In	2012 - 2017	10-60	8-32
Interior and Exterior Finishes	2012 - 2017	8-10	8-16
Phase 2 – Site Preparation			
Abatement & Demolition	2014 – 2017	16-20	8-16
Grading and Infrastructure	2016 - 2019	26-85	224-256
Phase 2 – Building Construction			
Structure/Rough In	2016 - 2021	26-68	16-64
Interior and Exterior Finishes	2016 - 2021	30-60	16-64
Candlestick Point			
Phase 1 – Site Preparation			
Abatement & Demolition	2010 - 2015	10-20	8-24
Grading and Infrastructure	2012 – 2016	16-33	8-144
Phase 1 – Building Construction			
Structure/Rough In	2023 - 2017	14-18	8-16
Interior and Exterior Finishes	2023 - 2017	8-10	8-16
Phase 2 – Site Preparation			
Abatement & Demolition	2014 – 2017	10-40	8-48
Grading and Infrastructure	2016 - 2019	24-63	8-40
Phase 2 – Building Construction			
Structure/Rough In	2016 - 2021	14-18	8-16
Interior and Exterior Finishes	2016 - 2021	8-10	8-16
Phase 3 – Site Preparation			
Abatement & Demolition	2018 – 2021	16-20	16-24
Grading and Infrastructure	2020 - 2023	24-60	8-40
Phase 3 – Building Construction			
Structure/Rough In	2019 – 2025	14-40	8-32
Interior and Exterior Finishes	2019 – 2025	8-20	8-32
Phase 4 – Site Preparation			
Abatement & Demolition	2022 – 2024	16-20	16-24
Grading and Infrastructure	2024 - 2026	24-35	8-16
Phase 4 – Building Construction			
Structure/Rough In	2024 - 2028	10-20	8-16
Interior and Exterior Finishes	2024 – 2028	8-20	8-32
Yosemite Slough Bridge	2015 – 2016	62-78	24-32
HPS Off-site Improvements	2011 – 2016	24-30	8-16
CP Off-site Improvements	2011 – 2015	24-30	8-16

Note:
1. Includes stadium construction.
Source: MACTEC, 2009.

Table 91
Daily Construction Workers and Trucks by Phase and Yearly Barge Trips
Shoreline Improvements

Project Area/Construction Year	Construction Duration (months)	Daily Construction Workers	Daily Construction Truck Trips	Yearly Barge Trips
Hunters Point Shipyard				
2013 Shoreline	9	12-14	--	0
2014 Shoreline	9	12-14	2-4	6
2015 Shoreline	10	33-38	2-4	35
2016 Shoreline	10	35-40	2-4	70
2017 Shoreline	10	35-40	2-4	70
2018 Shoreline	10	35-40	2-4	60
Candlestick Point				
2019 Shoreline	2	5-7	--	2
2022 Shoreline	2	5-7	--	2
2023 Shoreline	3	5-7	--	4
2024 Shoreline	1	5-7	--	3
2026 Shoreline	3	5-7	--	4
2027 Shoreline	4	5-7	--	6

Note:
1. Includes stadium construction.
Source: MACTEC, 2009.

Shoreline improvements at both Hunters Point Shipyard and Candlestick Point would peak in 2016 and 2017, and would require an additional 40 to 50 construction workers on-site.

Construction related activities would generally occur Monday through Saturday, between 7:00 A.M. and 8:00 P.M., and the typical work shift for most construction workers would be from 7:00 A.M. to about 3:30 P.M. Construction is not anticipated to occur on Sundays or major legal holidays, but may occur on an as-needed basis. The hours of construction would be stipulated by the Department of Building Inspection, and the contractor would be required to comply with the San Francisco Noise Ordinance.[22] Delivery and removal of extra long or wide bridge construction components, equipment, or materials may occur outside theses hours on an as-needed basis.

Construction staging would mostly occur within the individual sites under construction or along existing street right-of-way. Construction staging would involve staging of construction vehicles, storage of construction materials, construction worker vehicles, delivery, and hauling trucks. Due to the large amount of vacant land in the Project site, construction staging would occur on-site,

[22] The San Francisco Noise Ordinance permits construction activities seven days a week, between 7:00 A.M. and 8:00 P.M.

and construction-worker vehicles would likely park near construction sites in the Project site during most phases, and would not occupy spaces on neighborhood streets.

While the exact routes that construction trucks would be using would depend on the location of individual construction sites, it is expected that Harney Way, Hunters Point Expressway, Innes Avenue, Evans Avenue, Cesar Chavez Street, and Third Street would be the primary haul routes between U.S. 101 and the various components of the Project.

In general, construction related transportation impacts would include impacts in the immediate vicinity of the development project under construction, on roadways within the Project site, and cumulative construction traffic impacts along the roadways in the Bayview Hunters Point neighborhood. Since the Project includes building construction as well as construction of a new street system and transit route extensions into the Project site, all Project construction operations would include plans for the closure of traffic/parking lanes and sidewalks adjacent to construction sites. The closure of sidewalks and parking lanes could last throughout the entire construction phase for each building or group of buildings. It is possible that more than one location within the Project site could be under construction at any one time and that multiple travel lane closures may be required.

During the construction period, temporary and intermittent disruption to existing and proposed transit routes and bus stops may occur, and some bus routes may need to be temporarily rerouted (for example, the 29-Sunset on Gilman Avenue and Giants Drive, the 54-Felton on Ingalls, the 23-Monterey and 44-O'Shaughnessey on Palou Avenue, and the 19-Polk on Innes Avenue. In addition, temporary and intermittent interference to transit operations caused by increased truck movements to and from the construction sites may occur. Any change in transit routes and stops would have to be coordinated and approved by the SFMTA.

Due to the reduction in travel lanes, the remaining travel lanes would become more congested with automobiles, trucks and buses, which would pose a greater challenge for bicycle travel in the area. Since bicycle traffic in the Project vicinity is relatively low, this impact is not anticipated to be significant. Existing pedestrian volumes along the key access routes and at the proposed construction sites are low and, therefore, any sidewalk closures or rerouting of the walkway would not significantly affect pedestrian circulation. In general, temporary pedestrian walkways must be maintained in order to facilitate pedestrian movements.

The construction activities associated with the Project would overlap with construction activities of other development projects in the area, notably the HPS Phase I, Executive Park site, Brisbane Baylands, Visitacion Valley, India Basin Shoreline, and the Hunters View site. In addition, the Project construction activities would also overlap with nearby proposed transportation improvement projects, such as the U.S. 101/Harney interchange improvements, and the Geneva Avenue Extension. These overlapping construction activities would increase the number of construction worker vehicles and trucks traveling to and from the project sites along Harney Way and Jamestown Avenue for the Executive Park project and for development within Candlestick Point, and on Cesar Chavez Street and Evans Avenue for the India Basin Shoreline, Hunters View project, and development within Hunters Point Shipyard. For example, construction activities of one or more projects that adversely affect roadway capacity (e.g., Harney Way widening), combined with construction vehicle traffic traveling to and from the roadway project and nearby development projects under construction (e.g., Executive Park and Candlestick Point), could result in increased delays due to traffic diversions and substantial increases in truck traffic.

Given the magnitude of development proposed for the area, the Project's prolonged construction period, and the lack of certainty about the timing of the projects in the area, significant Project-related and significant Project contributions to cumulative traffic and circulation impacts could occur on some roadways, such as U.S. 101, Cesar Chavez Street, Evans Avenue, Harney Way, and Bayshore Boulevard. Cumulative impacts would include construction detours and increased travel times, although the extent and duration of delay would vary depending on individual driver's origin and destination, time of travel and use of alternate routes. Implementation of individual traffic control plans would minimize impacts associated with each project and reduce each project's contribution to cumulative impacts in overlapping areas. However, some disruption and increased delays could still occur even with implementation of traffic control plans, and it is possible that significant construction-related traffic impacts on local and regional roadways could still occur.

> ***Project Mitigation Measure 16***: The Project Applicant shall develop and implement a Candlestick Point–Hunters Point Shipyard Phase II Construction Traffic Management Program to minimize impacts of the Project and its contribution to cumulative impacts related to construction activities and construction traffic. The program shall provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. The program shall supplement and expand, rather than modify or supersede any manual, regulations, or provisions set forth by SFMTA, DPW or other City departments and agencies.
>
> Preparation of the Construction Management Program shall be the responsibility of the Project Applicant, and shall be reviewed and approved by SFMTA and DPW prior to initiation of construction. The Project Applicant shall update the program prior to approval of development plans for Phase 2, Phase 3 and Phase 4 of construction to reflect any change to Project development schedule, reflect transportation network changes, to update status of other development construction activities, and to reflect any changes to City requirements.

The program shall:

- Identify construction traffic management practices in San Francisco, as well as other jurisdictions that although not being implemented in the City could provide useful guidance for a project of this size and characteristics.
- Describe procedures required by different departments and/or agencies in the City for implementation of a construction management plan, such as reviewing agencies, approval process, and estimated timelines.
- Describe coordination efforts associated with the Navy remediation efforts and scheduling regarding construction vehicle routing via the Crisp gate.
- Identify construction traffic management strategies and other elements for the Project, and present a cohesive program of operational and demand management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities in the Bayview Hunters Point area. These could include construction strategies, demand management strategies, alternate route strategies, and public information strategies.
- Coordinate with other projects in construction in the immediate vicinity, so that they can take an integrated approach to construction-related traffic impacts.
- Present guidelines for selection of construction traffic management strategies.

Implementation of Project Mitigation Measure 16 would help minimize the Project construction-related transportation impacts, and the Project's contribution to cumulative-construction related transportation impacts. However, some disruption and increased delays could still occur even with implementation of Mitigation Measure 16, and it is possible that significant construction-related transportation impacts on local and regional roadways could still occur. Localized construction-related transportation impacts would therefore remain *significant and unavoidable*.

Project Variants: Construction activities associated with the Variant 1 and Variant 2 would be similar to the Project. These variants do not include construction of a new stadium at Hunters Point Shipyard, instead assume an additional 2,500,000 square feet of research and development uses under Variant 1, and reallocation of 1,350 residential units from Candlestick Point to Hunters Point Shipyard under Variant 2. Depending on the phasing of the additional development, the Variants 1 and 2 may result in fewer construction traffic impacts between future years 2012 and 2017 when the new stadium is proposed to be constructed, and somewhat greater impacts in the years the additional R&D space or housing units would be constructed. Implementation of a traffic control plan would reduce the project's contribution to significant cumulative impacts of overlapping construction traffic. However, as with the Project, cumulative transportation impacts associated with construction activities would be considered *significant and unavoidable.*

Implementation of Project Mitigation Measure 16 would be applicable to Project Variants 1 and 2. A Hunters Point Shipyard – Candlestick Point Construction Traffic Management Program would help minimize the Project Variants' construction-related transportation impacts and contribution to cumulative-construction related transportation impacts. However, since some disruption and increased delays could still occur even with implementation of the mitigation measure, and it is possible that significant construction-related transportation impacts on local and regional roadways could still occur. Localized construction-related transportation impacts would therefore remain *significant and unavoidable.*

6.10.2 Alternatives to the Project

Alternative 1 – No Project: Construction activities associated with Alternative 1 would be less than the Project. Alternative 1 assumes buildout of Hunters Point Shipyard Phase II per the Hunters Point Shipyard Redevelopment Plan and EIR (February 2000) and subsequent addendums dated November 19, 2003 and July 13, 2006. Under Alternative 1, the existing stadium would remain and no construction activities would occur within Candlestick Point. Due to the reduced level of development anticipated for Hunters Point Shipyard construction impacts associated with Alternative 1 would be *less than significant*.

Alternative 2 – No Bridge: The Alternative 2 development program is the same as the Project; however, Alternative 2 would not include construction of the Yosemite Slough bridge. Therefore, Alternative 2 would not include the construction impacts associated with the bridge and access roads (proposed to occur between 2015 and 2016). All other construction activities and impacts would be the same as described for the Project above. As with the Project, cumulative traffic impacts during construction would be considered *significant.*

Project Mitigation Measure 16 would be applicable to Alternative 2. Implementation of this measure would help minimize Alternative 2's construction-related transportation impacts, and contribution to cumulative-construction related transportation impacts. However, since some disruption and increased delays could still occur even with implementation of traffic control plans, and it is possible that significant construction-related transportation impacts on local and regional roadways could still occur. Localized construction-related transportation impacts would therefore remain *significant and unavoidable.*

Alternative 3 – 49ers stay at Candlestick: Construction activities associated with Alternative 3 would be less than for the Project within the Candlestick Point area. Construction within Hunters Point Shipyard would be similar to the Project; however, 1,350 residential units would be developed within Hunters Point Shipyard. Within Candlestick Point the existing stadium would remain, and only 1,210 residential units would be constructed. Overall construction activities and impacts would be somewhat less than identified for the Project, however, as with the Project cumulative traffic impacts during construction would be *significant*.

Project Mitigation Measure 16 would be applicable to Alternative 3. Implementation of this measure would help minimize Alternative 3's construction-related transportation impacts, and contribution to cumulative-construction related transportation impacts. However, since some disruption and increased delays could still occur even with implementation of traffic control plans, and it is possible that significant construction-related transportation impacts on local and regional roadways could still occur. Localized construction-related transportation impacts would therefore remain *significant and unavoidable.*

Alternative 4 – Lesser Build: Alternative 4 assumes a general reduction in development as compared to the Project (approximately a 30 percent reduction), and therefore construction activities and impacts would be similar to the Project, however, the extent and duration would likely be somewhat less than identified for the Project. As with the Project, cumulative traffic impacts during construction would be *significant*.

Project Mitigation Measure 16 would be applicable to Alternative 4. Implementation of this measure would help minimize Alternative 4's construction-related transportation impacts, and contribution to cumulative-construction related transportation impacts. However, since some disruption and increased delays could still occur even with implementation of traffic control plans, and it is possible that significant construction-related transportation impacts on local and regional roadways could still occur. Localized construction-related transportation impacts would therefore remain *significant and unavoidable.*

Alternative 5 – Park Agreement: The Alternative 5 development program is similar to Project Variant 2, which assumes 1,350 more residential units in Hunters Point Shipyard rather than in Candlestick Point. Alternative 5 does not include construction of a new stadium or a Yosemite Slough bridge, and therefore construction activities associated with these elements would not occur. As with the Project, cumulative traffic impacts during construction would be *significant.* As with the Project, cumulative traffic impacts during construction would be considered *significant.*

Project Mitigation Measure 16 would be applicable to Alternative 5. Implementation of this measure would help minimize Alternative 5's construction-related transportation impacts, and contribution to cumulative-construction related transportation impacts. However, since some disruption and increased delays could still occur even with implementation of traffic control plans, and it is possible that significant construction-related transportation impacts on local and regional roadways could still occur. Localized construction-related transportation impacts would therefore remain *significant and unavoidable.*

6.11 STADIUM AND ARENA IMPACTS

This section describes the impacts associated with replacing Candlestick Park stadium with a new 49ers stadium that would be located in the Hunters Point Shipyard. In addition, this section analyzes impacts associated with the proposed arena in Candlestick Point. A Sunday 49ers game and a weekday secondary event are analyzed for the stadium, and a weekday event was analyzed for the arena.

6.11.1 Stadium 49ers Game Impacts

No Project

<u>*Auto Congestion*</u>

Due to projected increases in background traffic on the study area freeways and traffic associated with buildout of land uses already approved for HPS, congestion following a football game would worsen somewhat over existing conditions on area roadways and freeways. On freeway facilities, substantial congestion and delays could be anticipated on U.S. 101 northbound and southbound at Hospital Curve, and at U.S. 101 near the new Geneva/Harney interchange, mainly near on- and off-ramp merge and diverge points. The existing post-game congestion that extends upstream from the Bay Bridge to the U.S. 101/I-280 merge would worsen in terms of extent of queue from existing conditions. **Table 92** presents freeway mainline segment and ramp merge and diverge section operating conditions under No Project alternative for conditions immediately following a football game.

On local streets, the primary locations of congestion following a football game are along the existing stadium's main exit routes. The main exit routes of the existing stadium (No Project conditions) are as follows:

- Harney Way, between Candlestick Park and U.S. 101
- Jamestown, Ingerson, Gilman, and Carroll Avenues, between Candlestick Park and Third Street
- Paul Avenue, between Third Street and Bayshore Boulevard
- Third Street, between Jamestown and Cesar Chavez Street

The analysis of No Project impacts assumes the proposed extension of Geneva Avenue from its current terminus at Bayshore Boulevard to connect across U.S. 101 to Harney Way would be in place. As part of the interchange project, additional capacity onto U.S. 101 would be provided. As a result, although queuing and congestion may worsen compared to existing conditions, due to background growth in traffic, actual stadium clearance times may improve somewhat over existing conditions due to the increased capacity at the new Geneva Avenue/Harney Way/U.S. 101 interchange. The improved capacity associated with this new interchange may be limited in terms of game day operations, though, depending on the operation of ramp meters.

Table 92
Freeway LOS Analysis – 2030 No Project Conditions
Sunday Peak Hour Following Football Game at Candlestick Park

Freeway	Direction	Location	2030 No Project Conditions	
			Density[1]	LOS
Basic Sections				
U.S. 101	NB	Cesar Chavez to I-80 Merge	**>45**	**F**
U.S. 101	NB	Harney Way to Third/Bayshore	**>45**	**F**
U.S. 101	SB	Third/Bayshore to Harney Way	**>45**	**F**
U.S. 101	SB	Harney Way to Sierra Point	**>45**	**F**
I-280	SB	Alemany off-ramp to Alemany on-ramp	35.4	**E**
Weaving Sections [2]				
I-280	NB	25th on-ramp to Mariposa off-ramp	1,310[2]	C
Merge Sections				
U.S. 101	NB	Harney Way (future)	**>45**	**F**
U.S. 101	NB	NB Bayshore Boulevard	**>45**	**F**
U.S. 101	NB	Alemany/Industrial	**>45**	**F**
U.S. 101	NB	NB Bayshore/Cesar Chavez	**>45**	**F**
U.S. 101	SB	EB Cesar Chavez/Potrero	**>45**	**F**
U.S. 101	SB	Alemany/San Bruno	21.2	C
U.S. 101	SB	SB Third Street/Bayshore	**>45**	**F**
U.S. 101	SB	Harney Way (future)	**>45**	**F**
U.S. 101	SB	Sierra Point Pkwy/Lagoon	**>45**	**F**
I-280	NB	NB Indiana/25th	**>45**	**F**

Notes:
1. Density measured in passenger cars per lane per mile. Density is undefined for LOS F conditions.
2. For weaving section, weaving volume is reported.
Source: Fehr & Peers.

Queuing

Queuing impacts associated with the post-game period at the stadium under the No Project conditions would be similar to those occurring under existing conditions. Following a football game at the existing stadium, the existing egress system effectively meters the traffic that can merge onto U.S. 101 and other routes so as to minimize mainline congestion. Virtually all egress routes from the stadium suffer congestion. Post-game field observations indicate that spectators begin leaving the stadium approximately one hour prior to the end of the game (between 3:00 and 4:00 p.m.) to avoid the peak congestion period. The percentage of spectators leaving prior to the end of the game depends on factors such as game score, weather, and/or traffic conditions. Typically, depending on the nature of the game and the weather, approximately 20 percent to 30 percent of the spectators leave during the one-half hour prior to the end of the game. These vehicles are able to exit the project vicinity (e.g., get onto the freeway or Third Street) under unconstrained conditions as the capacity of the egress system can accommodate these vehicles.

However, immediately following the end of the game is the time when the vast majority of the spectators begin to leave the stadium and enter the roadway egress system, thus resulting in queues along the roadways leading to the freeway and Third Street. For example, vehicles directed to use Harney Way for egress develop queues that extend from the U.S. 101/Harney Way interchange along Harney Way to Hunters Point Expressway. Under existing conditions, all queues in the study area begin to dissipate sometime between approximately 1.5 to 2 hours following the end of the game.

Parking

Under the No Project conditions, the off-street parking supply provided as part of stadium operations would not substantially change from the 18,880 spaces described in section 3.7.2. Approximately 9,110 spaces would continue to be located in the stadium lots, 5,470 on undeveloped state park land, and 4,300 in satellite parking lots. An additional 3,000 spaces are currently estimated to be provided on private lots. However, some of the satellite and private lots may not be available in the future due to development of other uses on that land (e.g., Executive Park development project). Development of the satellite and private lots would likely occur gradually so that the parking deficit would increase incrementally over time. Without the use of satellite lots, and without the provision of additional parking on-site (such as in a garage) or off-site (on adjacent properties such as Brisbane Baylands), stadium spectators would park on-street further from the stadium (such as in the Bayview or Little Hollywood neighborhoods), or switch to alternative modes of transportation such as transit or charter buses.

Project

Traffic Impacts

With the Project, the existing traffic management of pre-game and post-game traffic would be adjusted to reflect the new stadium location and access routes. The Project calls for a new Traffic Management Center, to be staffed by City employees, to dynamically monitor and operate traffic signals along primary ingress and egress routes to efficiently move traffic into and out of the area prior to and after games. In addition, similar to existing conditions, traffic control officers would be stationed at key locations to ensure efficient traffic movements. The overall game day traffic control plan is shown in **Figure 35.**

Similar to existing conditions, the majority of stadium bound traffic would use a portion of U.S. 101 to access the project site on game days. Traffic from the south would predominantly use northbound U.S. 101 and access the site via Harney Way, while traffic from the north would predominantly use southbound U.S. 101 and I-280 and access the site via Cesar Chavez Street, Cargo Way, Evans Avenue, and Innes Street. Some trips to the site would use Bayshore Boulevard or Third Street to access the area via Carroll Avenue, Gilman Avenue and Ingalls Street.

SOURCE: Fehr & Peers; AECOM

FIGURE 35: GAME DAY TRAFFIC CONTROL PLAN

Prior to and after games in the proposed stadium, special measures (similar to those in place for existing football games) would be taken to allow the site's circulation system to accommodate unique game day traffic flows. **Figure 36** presents the site's pre-game circulation plan and **Figure 37** presents the site's post-game circulation plan. Prior to games, the site's roadways would be geared towards inbound flow and after games the roadways would be geared towards outbound flow.

Vehicles accessing the new stadium from the south would use Harney Way. Harney Way would be configured to provide four inbound lanes (to the stadium) and one outbound lane between U.S. 101 and Arelious Walker Drive. Arelious Walker Drive, between Harney Way and Crisp Avenue would provide four inbound lanes. Crisp Avenue would provide seven inbound lanes between Arelious Walker Drive and the new stadium. The lane configurations would be reversed for post-game conditions.

Vehicles accessing the new stadium from the south, would be routed via the routes described above to Crisp Avenue, where it would be channeled to a Ring Road on the southern portion of the stadium. Access to the internal parking aisles would be from the Ring Road.

Vehicles accessing the new stadium from the north would use Evans Avenue and Cargo Way. These inbound routes would merge at Hunters Point Boulevard/Jennings/Evans. From there, the inbound route along Hunters Point Boulevard and Innes Avenue would provide four inbound lanes and one outbound lane. The lane configurations along Hunters Point Boulevard and Innes Avenue would be reversed for post-game conditions.

Under typical traffic conditions, traffic impacts are measured in terms of intersection levels of service. However, due to the unique circumstances following a football game, including manual and dynamic control of intersections by traffic control officers and complex travel patterns, traditional methods of calculating intersection levels of service may not be appropriate. Instead, for post-game conditions, traffic impacts associated with the new stadium are described in terms of the magnitude, duration, and expected locations of congestion.

The one hour period immediately following the conclusion of a football game is generally the most congested period. The amount of vehicular traffic associated with the new stadium is expected to be similar to, or even slightly less than, the amount of traffic associated with the existing stadium because of the improved transit service proposed to serve the new stadium. However, because under the project conditions, there would be additional development around the stadium compared to the No Project alternative, the additional vehicle trips associated with the new stadium and increased surrounding development would somewhat increase congestion and delays following a football game from 2030 No Project conditions.

SOURCE: Fehr & Peers; AECOM

FIGURE 36: PROPOSED STADIUM GAME DAY INGRESS ROUTES

SOURCE: Fehr & Peers; AECOM

FIGURE 37: PROPOSED STADIUM GAME DAY EGRESS ROUTES

As shown on **Table 93**, the proposed location of the new stadium would create additional exit routes such that more streets would be congested following a game than under the No Project conditions. Providing additional egress routes would spread the post-game congestion, and provide a quicker parking lot clearance time. However, it would result in game day traffic congestion along Innes Avenue, Evans Avenue, and Cargo Way, which would not experience substantial congestion following a game under the 2030 No Project condition.

Table 93
Locations of Congestion Following San Francisco 49ers Football Game

Exit Route	No Project (Existing Stadium)	Project (HPS Stadium)
Harney Way, between Candlestick Park and U.S. 101	X	X
Jamestown, Ingerson, Gilman, and Carroll Avenues, between Candlestick Park and Third Street	X	X
Paul Avenue, between Third Street and Bayshore Boulevard	X	X
Third Street, between Jamestown and Cesar Chavez Street	X	X
Innes Avenue/Hunters Point Boulevard, between Earl Street and Jennings Street		X
Jennings Street/Cargo Way/Illinois Street, between Evans Avenue and 25th Street		X
Evans Avenue, between Jennings Street and Cesar Chavez Street		X
Cesar Chavez Street, between U.S. 101 and I-280		X

Note:
Analysis based on expected stadium exit routes. Other exit routes identified in **Figure 37**, but not shown on this table are downstream of major bottlenecks and, although expected to carry additional post-game traffic, are not expected to function at capacity.
Source: Fehr & Peers.

One result of providing additional egress routes from the proposed new stadium is that traffic congestion is expected to clear the area quicker. **Table 94** presents the expected parking lot clearance time under No Project conditions (based on the current stadium exit capacity) and Project conditions, based on the existing and proposed stadium travel demand scenarios described in the travel demand discussion. The total travel demand assumed in the calculations for the proposed stadium is based on the number of vehicles parked in the stadium parking lot. Although there may be some additional vehicles parked off-site (i.e., outside of the Project study area), they would be parked beyond the expected area bottlenecks, and therefore, would not likely increase the amount of time to clear post-game congestion.

Table 94
Post-Game Exit Demand and Clearance Times

Scenario	Assumptions	Exit Demand (vehicles)		Clearance Time (hours:minutes)	
		Existing Stadium	HPS Stadium	Existing Stadium[1]	HPS Stadium: With U.S. 101 Interchange[2]
Most Conservative	Sold-out event, everyone leaves at end of event	21,875	17,075	2:50	1:28
	Sold-out event, 10% leave early, 5% stay late	18,590	14,510	2:25	1:14
	90% attendance, 10% leave early, 5% stay late	16,730	13,060	2:10	1:11
Average	90% attendance, 15% leave early, 5% stay late	15,750	12,290	2:03	1:07
	80% attendance, 15% leave early, 5% stay late	14,000	10,930	1:49	1:00
	80% attendance, 20% leave early, 5% stay late	13,130	10,250	1:42	0:56
Least Conservative	70% attendance, 20% leave early, 5% stay late	11,480	8,960	1:29	0:49

Notes:
1. Based on existing stadium clearance capacity of 7,700 vehicles per hour.
2. Ultimate HPS Stadium clearance capacity is projected to be 11,000 vehicles per hour, which is constrained by the exit gates at the stadium parking lot. Under this condition, the 1,000 spaces in the Candlestick Point retail structure are unconstrained and would be able to clear faster than the stadium parking lot. Therefore, demand from these spaces is not included in the calculation of parking clearance times. However, to be conservative, the analysis assumes that for non-sellout games, all parking occurs in the stadium lots and that the parking adjacent to the Candlestick Point retail structure is unused.
Source: Fehr & Peers.

As shown in **Table 95,** although the number of roadways expected to experience post-game traffic congestion is expected to increase with the Project, the total duration of expected post-game congestion is expected to be considerably less than under the 2030 No Project condition.

Similar to the roadway analysis, because the post-game traffic is expected to be spread out over a greater number of exit routes. As a result more freeway interchanges are expected to handle larger numbers of game day traffic. As shown in **Table 95,** two freeway facilities, I-280 southbound between the Alemany Street off- and on-ramps and U.S. 101 northbound at the on-ramp from Bayshore Boulevard would actually see improvements, compared to the 2030 No

Project conditions. This is because traffic from the proposed stadium location would use different routes to reach the freeway. The Project would impact the segment of I-280 northbound between 25th Street/Indiana Street and Mariposa Street.

Table 95
Freeway LOS Analysis – 2030 No Project and Project Conditions
Sunday Peak Hour Following Football Game at Candlestick Park

Freeway	Direction	Location	2030 No Project Conditions		2030 Project Conditions	
			Density[1]	LOS	Density[1]	LOS
Basic Sections						
U.S. 101	NB	Cesar Chavez to I-80 Merge	**>45**	**F**	**>45**	**F**
U.S. 101	NB	Harney Way to Third/Bayshore	**>45**	**F**	**>45**	**F**
U.S. 101	SB	Third/Bayshore to Harney Way	**>45**	**F**	**>45**	**F**
U.S. 101	SB	Harney Way to Sierra Point on-ramp	**>45**	**F**	**>45**	**F**
I-280	SB	Alemany off- to Alemany on-ramp	**35.4**	**E**	30.8	D
Weaving Section[2]						
I-280	NB	25th on-ramp to Mariposa off-ramp	1,220	C	>1,900	**F**
Merge Sections						
U.S. 101	NB	Harney Way (future)	**>45**	**F**	**>45**	**F**
U.S. 101	NB	NB Bayshore Boulevard	**>45**	**F**	34.6	D
U.S. 101	NB	Alemany/Industrial	**>45**	**F**	**>45**	**F**
U.S. 101	NB	NB Bayshore/Cesar Chavez	**>45**	**F**	**>45**	**F**
U.S. 101	SB	EB Cesar Chavez/Potrero	**>45**	**F**	**>45**	**F**
U.S. 101	SB	Alemany/San Bruno	21.2	C	22.4	C
U.S. 101	SB	SB Third Street/Bayshore	**>45**	**F**	**>45**	**F**
U.S. 101	SB	Harney Way (future)	**>45**	**F**	**>45**	**F**
U.S. 101	SB	Sierra Point Pkwy/Lagoon	**>45**	**F**	**>45**	**F**
I-280	NB	NB Indiana/25th	**>45**	**F**	**>45**	**F**

Note:
1. Density measured in passenger cars per lane per mile. Density undefined for LOS F conditions.
2. For weave section, weaving volume is reported.
3. Although analysis is conducted for peak hour, depending on game conditions (attendance, weather, game score, etc.), duration of peak post-game conditions may be longer than one hour (see Table 91).
Source: Fehr & Peers.

The Project would result in new freeway facilities operating unacceptably. However, the duration of expected congestion would likely be less due to the higher level of transit use, the Transportation Management Center housed within the stadium to increase efficiency of exiting traffic, and the greater amount of identified post-game exit routes and freeway access points. Overall, since new facilities, including local streets and freeway facilities, would experience congested traffic following a football game, traffic impacts associated with the new stadium during game days would be considered *significant.*

The Project includes measures to reduce the magnitude of the traffic impacts associated with the new stadium, including limiting the parking supply, providing a more robust transit system, and locating the stadium so as to better disperse traffic following a game. As a result, the exit capacity of the new stadium would be greater than that of the existing stadium. Mitigation measures associated with additional roadway widening would degrade pedestrian and bicycle conditions during non-game days, which represent the vast majority of the time, and were therefore not considered further. However, Project Mitigation Measure 17 is required to ensure that a management plan for accommodating the increased vehicle, transit, pedestrian and bicycle demands during game days is prepared and implemented.

Project Mitigation Measure 17: The stadium operators shall develop and maintain a Transportation Management Plan (TMP) for the stadium. The stadium operator shall work with representatives from the SFMTA, the State Highway Patrol, the Police Department, private charter operators, Caltrain and others on a continuing basis to develop and refine the TMP, as determined appropriate by SFMTA. The final stadium TMP shall be approved by SFMTA. Preparation of the TMP shall be fully funded by the stadium operator, and shall be completed in time for implementation on opening day of the stadium.

The following actions shall be included in the TMP:

- Information on transportation options to the stadium, including game day service by the various regional service providers shall be distributed to season ticket holders, employees, and other patrons if possible.
- A brochure, information packet, and/or web page providing full information on transit access to the stadium, similar to that currently offered at the 49ers website, shall be updated and maintained.
- The use of charter buses to the stadium shall be encouraged and expanded. A number of measures shall be considered that could be implemented at low-cost to expand the use of group charters, including reduced parking costs, publicize the groups in 49ers publications and mailings, provide priority parking, provide lounges for bus drivers and provide support services for rooter clubs.
- Residential Permit Parking Program and/or additional parking restrictions, such as time limits, during game days, particularly in the Bayview Hunters Point areas, shall be explored with residents to reduce potential for intrusion of stadium vehicles into the adjacent neighborhood during a football game or secondary event.
- The stadium operator shall implement measures to encourage carpools of 4-plus persons per vehicle.
- The stadium operator shall charge a higher parking cost for low occupancy vehicles.
- The stadium operator shall develop a separate TDM plan for employees of the stadium and concessionaires. The plan shall consider measures such as providing

employees and concessionaires with free or subsidized transit passes to encourage transit use and reduce vehicular travel to the stadium. Employees shall not receive preferential parking.

- The stadium operator shall develop measures with CPSRA to ensure that game day spectators do not park in CPSRA day use parking lots. Strategies to be explored include limiting parking in CPSRA lots to a limited duration during game days (e.g., to a two-hour period), or an increase in parking fees equivalent to game day parking, and ticketing and enforcement.
- The TMP shall ensure that regular transit routes operate acceptably near the stadium. The plan should consider providing alternate routes for those transit lines that do not have exclusive right of way on game days (48-Quintara-24th Street, 44-O'Shaughnessy, 29-Sunset) onto transit-only facilities such as the BRT right of way to the south and Palou Avenue to the north (which would be a transit-only facility on game days).

Implementing this mitigation measure would likely reduce automobile travel to the stadium and encourage transit usage. However, even with implementation of Project Mitigation Measure 17, the Project's impacts on Sunday pre-game and post-game period traffic conditions would remain *significant and unavoidable.*

Transit Impacts

During game days, the regularly scheduled bus service adjacent to the stadium would continue to operate on normal routes, providing direct service to the stadium and into the Hunters Point Shipyard Transit Center. **Figure 38** presents the game day transit service. Special game day transit, including charter buses and public transit express service would access the stadium via Palou Avenue, which would be converted to transit-only on game days. These buses would conduct passenger loading and unloading on Crisp Avenue, in front of the stadium. The stadium parking program calls for 340 bus parking spaces to store empty buses during the game.

During sellout games, about 16,388 spectators and 652 game day employees are expected to use transit to access the stadium, a total of 17,040 transit riders. Assuming similar transit ridership from regional providers (including charter service expected to replace service previously provided by Golden Gate Transit, the Santa Clara Valley Transportation Authority, and SamTrans) and other private charters, the expected Muni ridership to the stadium would be 12,040 (an increase of about 5,500 patrons from existing conditions). This ridership includes transit patrons who use regional transit, such as Caltrain and BART, and transfer to Muni to access the stadium.

SOURCE: Fehr & Peers; AECOM

FIGURE 38: PROPOSED STADIUM GAME DAY TRANSIT

As presented in **Table 96,** the combination of regularly scheduled transit service and game day express routes, similar to what is provided to the existing stadium, is expected to be approximately 8,400 passengers per hour. Therefore, with a projected Muni ridership of 12,040 patrons and capacity of 8,400 passengers per hour, there would be a capacity shortfall of approximately 3,640 passengers per hour. This shortfall in transit capacity would be considered significant.

Table 96
Game Day Muni Capacity by Line

Route	One-Way Hourly Capacity (passengers per hour)
24-Divisadero	400 [1]
28L-19th Avenue/Geneva Avenue	800 [1]
44-O'Shaughnessy	450 [1]
48-Quintara-24th Street	250 [1]
Game Day Express Service (75X, 77X, 78X, 79X, 86, and 87)	6,500 [2]
Total	**8,400**

Notes:
1. Assumes Sunday peak hour capacity is 75 percent of typical weekday peak hour capacity, per SFMTA TEP assumptions.
2. Based on existing ridership on these express routes
Source: SFMTA, Fehr & Peers.

Project Mitigation Measure 18: SFMTA shall increase frequency on regularly scheduled Muni routes serving the stadium area on game days. In addition, the stadium operator shall fund additional Muni shuttle service between the stadium and regional transit service, including BART (Balboa Park and/or Glen Park Station) and Caltrain (Bayshore Station). Although the specific frequencies of individual routes should be determined based on patron characteristics that may evolve over time, the increased transit service, taken as an aggregate, should generally compensate for the projected shortfall of 3,600 passengers per hour on the existing and proposed transit lines.

Prior to opening day at the new stadium, the City and stadium operator shall determine costs associated with the increased service and determine funding sources. Examples of funding sources that shall be considered include a surcharge on game tickets or other such revenue mechanism. Implementation of increased transit service would be the responsibility of SFMTA and the stadium operator, and would be implemented when projected attendance warrants additional service.

With implementation of Project Mitigation Measure 18, the Project's impacts to transit service on Sundays during a football game could be reduced to less-than-significant levels. However, area roadways would experience congestion during post-game conditions that could be lessened but not eliminated with mitigation, and the transit lines serving the Project vicinity would be subject to traffic congestion. Therefore, the effectiveness of providing additional capacity may be limited due to the traffic impacts on transit operations, and therefore, the impact on transit operations would remain *significant and unavoidable.*

<u>*Bicycle Impacts*</u>

The Project would improve bicycle access to the area in terms of new bicycle lanes on existing and reconfigured roadways, and bicycle access within and in the vicinity of the Project site would be maintained on game days. However, bicycle access would be constrained due to the heavy traffic volumes at locations further away from the Project site where bicycle lanes are not provided. At these locations, bicyclists would likely divert to roadways not designated as stadium access routes (e.g., bicyclists may use Revere Avenue instead of Gilman Avenue for access to and from the stadium).

For those patrons arriving by bicycle, the proposed stadium would provide improved amenities compared to the existing stadium. Bicycle racks and lockers would be provided at the stadium entrances. In addition, a bicycle valet, similar to the service operated at AT&T Park for San Francisco Giants baseball games would be provided.

Bicycle access to the stadium on football game days would be difficult, as at present, due to heavy traffic volumes. However, bicycle access to the new stadium would be provided, and impacts on bicycle operations would therefore be *less than significant.*

<u>*Pedestrian Impacts*</u>

Pedestrian access to the stadium from external locations would be provided via 15-foot sidewalks on either side of Crisp Avenue. All other streets leading into the stadium site would provide 12 to 15-foot-wide sidewalks. Near the stadium, game day pedestrians would be allowed to cross the Crisp Avenue at two locations where the Ring Road intersects Crisp Avenue. In addition, pedestrians traveling between the stadium and the 3,000 parking spaces in the Hunters Point Shipyard R&D campus would cross the Ring Road on the south side of Crisp Avenue. Because of the need to balance pedestrian flows with efficient auto egress, temporary pedestrian overcrossings, similar to the one recently installed across Hunters Point Expressway, would be provided. Traffic control officers would also be stationed at the overcrossings, as well as at other at-grade crossings.

Pedestrian travel throughout the Project site may be disrupted by game day traffic, and pedestrian travel near the new stadium, would experience crowding. However, this is expected and understandable for large events, and would be similar to conditions at the existing stadium.

Pedestrian access to the stadium during game days would be difficult, as at present, due to heavy traffic volumes. However, since pedestrian access would be maintained, stadium game day impacts on pedestrian circulation would be *less than significant.*

<u>*State Park Access Impacts*</u>

With the Project, the Bay Trail around Yosemite Slough would be completed, and all existing connections to the Bay Trail would be maintained. Pedestrian and bicycle access to the developed state park lands would be maintained, and the Project's extensive improvements to the area bicycle and pedestrian network would facilitate access to the state parks lands. Pedestrian and bicycle access to state park lands on game days would be similar to existing condition; that is, heavy traffic congestion in the pre- and post-game periods could discourage bicycle use to and from CPSRA during these periods, generally during two hours before and after each game.

Because there would be at least one lane open to traffic in each direction during pre- and post-game operations on roadways providing access to CPSRA facilities, vehicle access to state parks would still be accommodated on game days. However, as with bicycle access, heavy traffic congestion during game days could discourage vehicular access to and from the state parks during these periods.

Overall, since vehicle, bicycle and pedestrian access to state park facilities would be maintained during game days, impacts related to access would be *less than significant.*

<u>*Parking Impacts*</u>

The 49ers stadium area would have a total supply of 17,415 game day parking spaces, as presented on **Figure 11.** A total of 12,665 of the 17,415 parking spaces would be adjacent to the stadium, and accessible via a new loop road on the southern portion of the stadium. Of the 12,665 spaces, 340 spaces adjacent to the stadium would be reserved for buses, and the remaining 12,325 would be for private autos, RVs, limos, etc. Parking structures on the north side of Crisp Avenue, immediately across from the stadium, would accommodate an additional 750 vehicles, and would be accessible from Crisp Avenue. The R&D campus in Hunters Point Shipyard would provide an additional 3,000 spaces, of which 2,747 would be in structures and 253 would be on street.[23] These spaces would be accessible from internal roadways, which, in turn, would be accessible from Crisp Avenue. An additional 1,000 spaces would be provided in Candlestick Point retail parking structure that on game days would be reserved for stadium spectators.

A sell-out event at the stadium would result in a total game day travel demand of 20,134 vehicles (excluding buses) that would need to be accommodated. The Project would have a total game day parking supply of 17,415 spaces, of which 17,075 would be available for vehicle parking

[23] The on-street parking spaces in Area C would be made available for fixed-rate, longer-term parking by football patrons and controlled by City parking control officers on game days.

(340 spaces would be designated for buses). The 20,134-space parking demand would not be met within the 17,075-space parking supply, thus resulting in a shortfall of 3,059 spaces.

It is anticipated that the shortfall would be met similar to existing conditions, where spectators park in satellite parking lots, on street, or within private lots in the area. Currently about 4,300 parking spaces are available within satellite lots, and about 3,000 spaces on private lots that are generally restricted for use by residents, customers, and employees of private businesses. The likely result is that many patrons may elect to park in other off-site parking lots and either walk or take transit to the stadium. Some patrons may park within the CPSRA day use parking lots. Additionally, some patrons may also elect to take transit instead. Through effective parking management, including real-time information, public relations campaigns, and parking pricing strategies, the additional parking demand can be effectively managed.

The satellite parking lots identified in the parking supply are privately owned and operated and are not under the control of the stadium operator. Some of the satellite and private lots may not be available in the future due to development of other uses on that land (e.g., Executive Park development project). Development of the satellite and private lots would likely occur gradually so that the parking deficit would increase incrementally over time. Without the use of satellite lots, and without the provision of additional parking on-site (such as in a garage) or off-site (on adjacent properties such as Brisbane Baylands), stadium spectators would park on street further from the stadium (such as in the Bayview), or switch to alternative modes of transportation such as transit or charter buses.

As noted above, during game days, 1,000 parking spaces in the Candlestick Point retail parking structure would be reserved for stadium spectators, and as a result fewer spaces would be available for Candlestick Point retail patrons. In general, peak parking demand for shopping centers is lower on Sundays than on Saturdays or weekdays, and it is expected that during game days retail patrons would adjust their shopping trip to outside of the game day period, find short-term parking on-street, or access the shopping center via transit. During December when parking demand at shopping centers increases due to holiday shopping, the number of retail patrons that would be affected would increase. However, these patrons could be accommodated within the transit service provided pre- and post-game days.

Since stadium game day parking demand would be accommodated within the proposed parking facilities, privately owned satellite parking lots, and on street, and since alternative modes of transportation such as transit and charter buses would be available for spectators, stadium game day impacts on parking would be *less than significant.*

<u>Loading Impacts</u>

The preliminary design for the new stadium includes loading dock accommodating four semi-trailer trucks and an adjacent TV staging and loading area. The TV staging and loading area would be used for loading/unloading on the days leading up to a game. Separate trash and recycling areas would be provided. The loading facilities for the stadium would be designed based on experience at the existing stadium, and for the needs for large special events such as Monday Night Football games or the Super Bowl.

A total of 100 delivery trucks are expected to serve the stadium in the week prior to a game. The majority of these trucks would serve the concession and food service functions. Stadium-bound delivery trucks would make their deliveries in advance of events to avoid peak travel periods that occur in the hours leading up to a game. Vendors would be notified by the stadium of appropriate delivery times.

Based on information obtained from the 49ers for the existing stadium, for a Sunday afternoon game, truck deliveries would occur in the middle of the week, with about 10 percent occurring on Wednesday, 40 percent on Thursday, and 50 percent on Friday. This truck traffic would be spread over the entire day. The peak stadium delivery day would be Friday, when approximately 50 trucks would make deliveries to the stadium. As is currently done, television trucks would arrive in advance of events to allow for appropriate set-up time and to avoid peak travel periods.

The proposed stadium loading facilities would be sufficient to accommodate projected demand, and therefore the impacts related to loading would be *less than significant.*

<u>*Emergency Vehicle Access*</u>

During game days, two-way inbound and outbound vehicular circulation would be provided at all times, via three primary routes. On the Harney Way/Arelious Walker Drive route, emergency vehicles would be allowed to use the BRT-only lanes (the BRT-only lanes break off from the primary auto route and continue on Harney Way, east of Arelious Walker Drive, and on Egbert Street before reconnecting with Arelious Walker Drive immediately south of the Yosemite Slough bridge). Emergency vehicles would also be allowed to use Palou Avenue, which would be transit-only on game days. Both of these routes would be free of congestion, and would offer emergency vehicle access between regional facilities and Crisp Avenue. Emergency vehicles would be able to enter the stadium parking lot via Crisp Avenue. Emergency vehicles would also be able to use Innes Avenue, as there would be at least one lane in each direction on this route open to traffic. However, since immediately following games the outbound direction may be congested, this may not be a desirable route as the Harney Way BRT lanes or Palou Avenue.

Since multiple emergency access routes would be provided, stadium game day impacts on emergency access would be *less than significant.*

Project Variants

Project Variant 1 and Variant 2 would be similar to the Project, but would not involve construction of a new stadium. Furthermore, the existing stadium at Candlestick Point would be demolished, and the 49er games would be played elsewhere. Game day impacts for Project Variant 1 and Variant 2 are *not applicable*.

Project Variant 3 would be similar to the Project and would include the proposed new football stadium. However, instead of being the exclusive home to the San Francisco 49ers, the stadium would be shared with another National Football League team, the Oakland Raiders. Game day operations and impacts under this scenario would be the same as the Project. The primary difference would be twice as many regular season games would be played at the stadium, and the chances of hosting post-season playoff games would be increased. Project Mitigation Measure 17 and Project Mitigation Measure 18 would be applicable to Project Variant 3. Similar to the Project, traffic and transit impacts related to the new stadium would be *significant and unavoidable*, and *b*icycle, pedestrian, State Park access, parking, loading and emergency access impacts related to the new stadium would be *less than significant*.

Alternatives to the Project

Alternative 1 – No Project: Game day conditions for Alternative 1 would be the same as for No Project conditions. Due to a projected increase in development in the area, traffic congestion on the local street network would increase compared to existing conditions, and traffic and transit impacts would be *significant and unavoidable.*

Alternative 2 – No Bridge*:* Alternative 2 would be the same as the Project, except that the Yosemite Slough bridge would not be constructed. Because the Yosemite Slough bridge is expected to accommodate four lanes of auto traffic into and out of the stadium before and after games, respectively, this would substantially reduce the ingress and egress capacity of the stadium. During the peak egress time, the egress capacity would be reduced by nearly 40 percent, as the stadium would lose 4 out of the proposed 11 total auto lanes exiting the stadium. This would serve to meter the amount of traffic leaving the stadium, which would mean similar or less congestion on area roadways, particularly those leading toward the U.S. 101/Harney Way interchange. However, the lower exit capacity would likely render the proposed new stadium site infeasible as a desirable option for an NFL football team. Project Mitigation Measure 17 and Project Mitigation Measure 18 would be applicable to Alternative 2. Similar to the Project, even with mitigation, traffic and transit impacts associated with the new stadium under Alternative 2 would be *significant and unavoidable*.

Similar to the Project, bicycle, pedestrian, State Park access, parking, loading and emergency access impacts related to the new stadium would be *less than significant.*

Alternative 3 – 49ers stay at Candlestick: Alternative 3 would involve less development overall, with slightly more development at the Hunters Point Shipyard site and virtually no change to the Candlestick Point area. Candlestick Park stadium would remain at its existing site. Assuming the 49ers would remain at that location, the game day operations under Alternative 3 would be similar to the Alternative 1, the No Project condition. Traffic and transit impacts associated with the existing stadium under Alternative 3 would be *significant and unavoidable.*

Alternative 4 – Lesser Build: Alternative 4 would be similar to the Project, however, the amount of development in the project site would be reduced compared to the Project. Under Alternative 4, the Candlestick Park stadium would be demolished, and no new stadium would be constructed. The 49er football games would be played elsewhere, and therefore there would not be any impacts related to game day operations. Game day impacts for this alternative are *not applicable*.

Alternative 5 – No Park Agreement*:* Alternative 5 would be similar to Project Variant 2, in which the Project is constructed, the Candlestick Park stadium would be demolished, and no new stadium would be constructed. The 49er football games would be played elsewhere, and therefore there would not be any impacts related to game day operations. Game day impacts for this alternative *are not applicable*.

6.11.2 Stadium Secondary Event Impacts

No Project Conditions

Under the No Project scenario, the existing Candlestick Park would remain and development would occur in the Hunters Point Shipyard site. Due to its age and the availability of other nearby newer facilities, the existing Candlestick Park does not host a great deal of special events. Although the background traffic would be higher than existing conditions under the 2030 No Project scenario and the combination of background traffic and special event traffic at Candlestick Park would be somewhat more severe than today's situation, special events at Candlestick Park would continue to be rare events.

Project

As indicated in section 4.2.4, other types of events, such as soccer games or concerts, may also be scheduled at the new stadium during the year. A typical secondary event could occur at any time of day and on any day of the week. The analysis of a secondary event at the stadium considers an expected crowd of about 37,500 spectators, with a weekday evening start time of about 7:00 p.m. The weekday PM peak hour was analyzed for pre-event conditions, for future year 2030 conditions with the Project.

Similar to football game day events, the majority of stadium bound traffic would use a portion of U.S. 101 to access the stadium site prior to secondary events. Traffic from the south would predominantly use northbound U.S. 101 and access the site via Harney Way, while traffic from the north would predominantly use southbound U.S. 101 and I-280 and access the site via Cesar Chavez Street, Cargo Way, Evans Avenue, and Innes Street. Some trips to the site would use Bayshore Boulevard or Third Street to access the area via Carroll Avenue, Gilman Avenue and

Ingalls Street. The Yosemite Slough bridge would not be used for secondary event vehicle traffic.

Traffic Impacts

The impact analysis of a secondary event at the new stadium assumed a weekday evening event with an attendance of 37,500 spectators. Secondary events could occur at any time of the day, and on any day of the week. Secondary events at the stadium would be limited to 20 total occurrences per year. The weekday PM peak hour was analyzed for pre-event conditions.

After exiting regional freeways, traffic generated by a secondary event would access the site via Cesar Chavez Street, Cargo Way, Evans Avenue, Innes Avenue, Bayshore Boulevard, Third Street, Carroll Avenue, Gilman Avenue, and Ingalls Street. The Yosemite Slough bridge would not be used for secondary event vehicle traffic. The number of vehicles on the roadways accessing the stadium would vary by route and the size of the event.

During a weekday evening secondary event, it is projected that approximately one half of vehicle trips generated by a secondary event, or 4,688 vehicles would arrive approximately one hour prior to an event start time, likely between 5:00 and 6:00 p.m., coinciding with the weekday evening peak hour. Project vehicle trips would be added to the following freeway facilities that would operate at LOS E or LOS F during the weekday PM peak hour:

- U.S. 101 northbound from Harney Way to Third/Bayshore
- U.S. 101 northbound from Sierra Point Parkway to Harney Way
- U.S. 101 southbound from Mariposa Street to Cesar Chavez
- U.S. 101 southbound off-ramp to Harney Way
- I-280 southbound off-ramp to Pennsylvania/25th

In addition, the secondary event would cause an additional off-ramp to operate at LOS F conditions:

- U.S. 101 southbound off-ramp to Bayshore/Cesar

Table 97 compares the intersection LOS operating conditions for the Project weekday PM peak hour conditions without a secondary event to conditions with a secondary event. The table includes only the intersections along the access routes that would be primarily affected by secondary event traffic. Although other study intersections may experience traffic increases immediately preceding and following an event, the increase is not expected to be substantial since those locations would not be on primary routes between regional transportation facilities and the stadium.

Table 97
Intersection Level of Service
Project and Secondary Event – Weekday PM Peak Hour – 2030 Conditions

Intersection		Project No Event		Project with Secondary Event	
		Delay [1]	LOS [2]	Delay	LOS
1	Third St/25th St	**>80**	**F**	**>80**	**F**
2	Third St/Cesar Chavez	**>80**	**F**	**>80**	**F**
4	Third St/Evans Ave	**>80**	**F**	**>80**	**F**
8	Third St/Carroll Ave	**75**	**E**	**74**	**E**
9	Third St/Paul Ave	**>80**	**F**	**>80**	**F**
10	Third St/Ingerson Ave	43	D	39	D
11	Third St/Jamestown Ave	**>80**	**F**	**>80**	**F**
12	Third/Le Conte/US 101 nb off	23	C	28	C
14	25th St/Pennsylvania Ave	40	D	45	D
16	Cesar Chavez St/Evans Ave	**>80**	**F**	**>80**	**F**
17	Cesar Chavez St/Illinois St	23	C	40	D
27	Alana Way/Beatty Ave [3]	**>80**	**F**	**>80**	**F**
28	Alana Way/Harney Way/Mellon [3]	**>80**	**F**	**>80**	**F**
29	Harney Way/Jamestown Ave [4]	41	D	**>80**	**F**
30	Crisp Ave/Palou Ave [4]	54	D	**>80**	**F**
31	Ingalls St/Thomas Ave [4]	33	C	**>80**	**F**
32	Ingalls St/Carroll Ave [4]	38	D	**>80**	**F**
34	A.Walker/Gilman Ave [4]	36	D	**>80**	**F**
35	Amador St/Cargo Way	**59**	**E**	**>80**	**F**
46	Innes Ave/A.Walker Drive [4]	6	A	**67**	**E**
47	Innes Ave/Earl St	19.4(sb)	C	22.4(sb)	C
48	Evans Ave/Jennings St	31	C	**>80**	**F**
58	Evans/Napoleon/Toland	**>80**	**F**	**>80**	**F**
59	Harney Way/Executive Park East	26	C	**>80**	**F**
60	Harney Way/Thomas Mellon	26	C	**>80**	**F**

Notes:
1. Delay in seconds per vehicle.
2. Intersections operating at LOS E or LOS F conditions highlighted in **bold.**
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.

Source: Fehr & Peers.

With a secondary event, an additional 9 intersections would operate at LOS E or LOS F conditions, beyond those identified for the PM peak hour under Project conditions, including:

- Harney/Jamestown
- Crisp/Palou
- Ingalls/Thomas
- Ingalls/Carroll
- Arelious Walker/Gilman

- Amador/Cargo
- Innes/Arelious Walker
- Evans/Jennings
- Harney/Executive Park East
- Harney/Thomas Mellon

Additionally, traffic associated with a secondary event would exacerbate traffic operations at 11 intersections that would operate at LOS E or LOS F conditions without a secondary event in the PM peak hour, including:

- Third/25th
- Third/Evans
- Third/Carroll
- Third/Paul
- Third/Jamestown
- Cesar Chavez/Evans
- Alana Way/Beatty
- Alana Way/Harney/Mellon
- Amador/Cargo Way
- Innes/Arelious Walker
- Evans/Napoleon/Toland

Overall, since new facilities, including local streets and freeway facilities, would experience congested traffic following prior to a secondary event, traffic impacts associated with the new stadium during secondary events would be *significant.*

> ***Project Mitigation Measure 19:*** The stadium operator shall develop as part of a stadium Transportation Management Plan (TMP), a strategy for coordinating with representatives of SFMTA and the SF Police Department for deploying traffic control officers in the Project vicinity to increase efficiency of pre- and post- event traffic, similar to what would be in place for football game days. The secondary event component of the stadium TMP shall be approved by SFMTA. The stadium operator shall fully fund implementation of the secondary event (i.e., non-49ers football events) measures.

Implementation of this mitigation measure would likely improve vehicle entrance and exit flows to the stadium site, maintain orderly traffic operations, and reduce intrusion onto neighborhood streets near the stadium. However, even with the implementation of Project Mitigation Measure 19 on days when special events are held at the stadium, the Project's impacts to the study roadway network would be *significant and unavoidable.*

<u>*Transit Impacts*</u>

During secondary events, regularly scheduled bus service adjacent to the stadium would continue to operate, providing direct service to the stadium and into the Hunters Point Shipyard Transit

Center. Additional secondary event-related transit service is not proposed. As shown in **Table 98**, the total one-way transit capacity serving the stadium site during a typical weekday PM peak hour would be 3,100 passengers per hour.

Table 98
PM Peak Hour One-Way Muni Capacity to Stadium by Line

Route	Peak Hour Frequency (minutes)	One-Way Hourly Capacity (passengers per hour)
24-Divisadero	6	635
28L-19th Avenue/Geneva Avenue	5	1,130
44-O'Shaughnessy	6	635
48-Quintara-24th Street	10	380
HPX – Hunters Point Express	12	320
Total		**3,100**

Notes:
Source: SFMTA, Fehr & Peers.

During the weekday evening period, up to 4,688 additional transit riders would be generated by a secondary event during the peak hour prior to the event. These would be in addition to the 1,037 transit trips inbound to the study area in the PM peak hour on routes serving the stadium area (e.g., 24-Divisadero, 28L-19th Avenue Limited, 44-O'Shaughnessey, 48-Quintara-24th Street, and HPX as extended to serve the event). Therefore, the overall one-way transit demand in the PM peak hour on days when a special event is being held at the stadium could be up to 5,725 riders. As shown in **Table 92,** the total one-way transit capacity serving the stadium site during a typical weekday PM peak hour would be 3,100 passengers per hour, which would result 2,625 riders that would not be accommodated. This would be considered a *significant impact*.

Project Mitigation Measure 20: SFMTA shall increase frequency on regularly scheduled Muni routes serving the stadium area prior to large special events. In addition, the stadium operator shall fund additional Muni shuttle service between the stadium and regional transit service, including BART (Balboa Park and/or Glen Park stations) and Caltrain (Bayshore station).

- Routes 24-Divisadero, 28L-19th Avenue Limited, and 44-O'Shaughnessey would already be operating near their maximum frequency. Therefore, this mitigation measure primarily applies to the 48-Quintara-24th Street route and the new HPX service. If each of these routes were increased to have five-minute frequencies (typically considered the maximum frequency that can be regularly maintained), the transit capacity toward the stadium would increase by 828 passengers per hour, for a total of 3,928 passengers. Even with the additional service on these two lines, there would be a shortfall of 1,797 passengers per hour in transit capacity.

- Additional express service to key regional transit destinations and regional charter express service, similar to what is offered on football game days, would offset a portion of the shortfall in transit capacity. The amount and nature of special service to special stadium events would depend on the type and size of the special event. Generally, the capacity of the express service should compensate for the shortfall of 1,797 passengers per hour for a 37,500-person event (transit supply, would of course, be designed on a case-by-case basis depending on the expected size of the secondary event).
- SFMTA and the stadium operator shall implement a stadium transportation systems plan similar to that developed for game-day operations (except that the Yosemite Slough bridge shall not be available for private automobiles), on a case-by-case basis depending on the expected size of the secondary event.

Prior to opening day at the new stadium, the City and the stadium operator shall determine costs associated with the increased service and determine funding requirements. Examples of funding sources that shall be considered include a surcharge on game tickets, parking or admission surcharge, or other such revenue mechanism. Implementation of increased transit service would be the responsibility of SFMTA and the stadium operator, and would be implemented when projected attendance warrants additional service.

With implementation of Project Mitigation Measure 20, the Project's impacts to transit service on special event days would be reduced, but not to less-than-significant levels. In addition, traffic impacts during secondary events would not be mitigated, and would impact transit operations. Therefore, the impact on transit operations would remain *significant and unavoidable.*

Bicycle Impacts

During secondary events, bicyclists would have access to the proposed bicycle facilities on existing and reconfigured roadways, as it is not anticipated that any special roadway network restrictions would be required to accommodate secondary event traffic. Bicycle access would be maintained on all study area roadways.

For those patrons arriving to the stadium by bicycle, the stadium would include bicycle racks and lockers would be provided at the stadium entrances. In addition, a bicycle valet, similar to the service operated at AT&T Park for the San Francisco Giants would also be provided. Overall, while traffic volumes on area roadways would increase during secondary events, the increase would not be sufficient to substantially affect bicycle circulation, and impacts on bicycle operations would therefore be *less than significant.*

<u>*Pedestrian Impacts*</u>

The proposed street and sidewalk network in the vicinity of the stadium is designed to accommodate sell-out football game day crowds accessing and leaving the stadium site. Pedestrian access to the stadium during secondary events would be accommodated within the existing and proposed sidewalk network, although due to large number of pedestrians and vehicles accessing the stadium, pedestrians may experience crowding. However, this is expected and would be managed during large events as part of the stadium operations. Therefore, secondary event impacts on pedestrian circulation would be *less than significant.*

<u>*Parking Impacts*</u>

The parking supply associated with secondary events would vary, depending on the size of the event. For a secondary event with 37,500 spectators, it is anticipated that the stadium parking supply of 12,665 spaces would be made available. These include the dual-use fields, paved lot, structured parking facilities, and on-street parking.

A stadium secondary event with 37,500 spectators is expected to generate up to 10,100 vehicles, or about one half that of a sell-out football game day. These vehicles would be accommodated within the stadium parking supply. Impacts of stadium secondary events on parking would be *less than significant.*

Variants

Project Variants 1 and 2 would be similar to the Project but would not involve construction of a new stadium. Furthermore, the existing stadium at Candlestick Point would be demolished. No stadium facilities would be present in the study area under Project Variants 1 and 2 and therefore there would be no secondary event venues capable of accommodating large crowds (i.e., more than 10,000 spectators). Secondary event impacts for Project Variants 1 and 2 would be *not applicable.*

Project Variant 3 would be similar to the Project and would include the proposed stadium at Hunters Point Shipyard. However, instead of being the exclusive home to the San Francisco 49ers, the stadium would be shared with the Oakland Raiders. In this case, the stadium would still likely host secondary events and would have the same impacts as the Project. Project Mitigation Measure 20 and Project Mitigation Measure 21 would be applicable to Project Variant 3. Traffic and transit impacts related to the stadium secondary events would be *significant and unavoidable*, and bicycle, pedestrian, and parking impacts would be *less than significant.*

Alternatives to the Project

Alternative 1 – No Project: Under Alternative 1, the existing Candlestick Park would remain and development would occur in the Hunters Point Shipyard site. Due to its age and the availability of other nearby newer facilities, the existing Candlestick Park does not host a great deal of special events. Although the background traffic would be higher than existing conditions under the 2030 No Project scenario and the combination of background traffic and special event traffic at Candlestick Park would be somewhat more severe than today's situation, special events at Candlestick Park would continue to be rare. Due to the rarity of special events at Candlestick Park, impacts would be *less than significant.*

Alternative 2 – No Bridge: Since special event traffic would not be able to use the Yosemite Slough bridge, special event conditions under Alternative 2 would be the same as described above for the Project. Project Mitigation Measure 20 and Project Mitigation Measure 21 would be applicable to Alternative 2. As with the Project, traffic and transit impacts would remain *significant and unavoidable,* and bicycle, pedestrian, and parking impacts would be *less than significant*

Alternative 3 – 49ers stay at Candlestick: As described in the No Project scenario, due to its age and the proximity of other newer stadiums, Candlestick Park would rarely hold large special events. Although background traffic volumes would be higher than under existing conditions or No Project conditions, the rarity of special events at Candlestick Park result in *less than significant* impacts.

Alternative 4 – Lesser Build: Alternative 4 would include less overall development, and would not include construction of a new stadium. Secondary event impacts for Alternative 4 are *not applicable*.

Alternative 5 – No Park Agreement: Alternative 5 would be similar to Variant 2, however, the existing stadium would be demolished, and a new stadium would not be constructed. Secondary event impacts for Alternative 5 are *not applicable*.

6.11.3 Arena Event Impacts

As described earlier, the Project includes a 10,000-seat arena in the Candlestick Point area. Although most events would have less than 10,000 attendees, preliminary economic analysis has indicated that the arena could hold up to 250 events annually with an average attendance of 5,000. The transportation analysis examines the worst-case scenario, in which a 10,000-person event is held on a weekday evening.

No Project Conditions

Under the No Project scenario, no arena would be constructed at the project site. Arena impacts for No Project conditions are *not applicable*.

Project

Traffic Impacts

The impact analysis of arena events assumed a weekday evening sell-out event at the 10,000-seat arena. Although no specific program has been developed for events at the arena, sell-out events with 10,000 attendees occurring during weekday evenings would likely be infrequent. Smaller-sized events during the weekday evening, and events occurring during the day and on weekends would have fewer impacts due to the lower traffic volumes demands on the study area roadways.

Access to the arena would be via the existing roadway network: U.S.101, Harney Way, Gilman Avenue, and Third Street—as well as local streets within Candlestick Point. The number of vehicles would vary by route and the size of the event.

During a weekday evening event, it is projected that approximately one half of vehicle trips generated by an arena event, or 1,333 vehicles would arrive approximately one hour prior to an event beginning, likely between 5:00 and 6:00 p.m., coinciding with the weekday evening peak hour. These vehicles would add project vehicle trips to regional facilities that would operate at LOS E or LOS F during the weekday PM peak hour for 2030 Project conditions:

- U.S. 101 northbound from Harney Way to Third/Bayshore
- U.S. 101 northbound from Sierra Point to Harney Way
- U.S. 101 southbound from Mariposa Street to Cesar Chavez
- U.S. 101 southbound off-ramp to Harney Way

Table 99 presents a comparison of intersection LOS operating conditions for the Project weekday PM peak hour conditions without a sell-out event to conditions with a sell-out event at the arena. The table includes only the intersections along the access routes that would be primarily affected by arena traffic.

Table 99
Intersection Level of Service
Project No Event and Arena Event – Weekday PM Peak Hour – 2030 Conditions

	Intersection	Project No Event		Project with Arena Event	
		Delay [1]	LOS [2]	Delay	LOS
1	Third St/25th St	**>80**	**F**	**>80**	**F**
2	Third St/Cesar Chavez	**>80**	**F**	**>80**	**F**
3	Third St/Cargo Way	**>80**	**F**	**>80**	**F**
4	Third St/Evans Ave	**>80**	**F**	**>80**	**F**
5	Third St/Oakdale Ave	**60**	**E**	**60**	**E**
6	Third St/Palou Ave	**>80**	**F**	**>80**	**F**
7	Third St/Revere Ave	**>80**	**F**	**>80**	**F**
8	Third St/Carroll Ave	**75**	**E**	**74**	**E**
9	Third St/Paul Ave	**>80**	**F**	**>80**	**F**
10	Third St/Ingerson Ave	43	D	41	D
11	Third St/Jamestown Ave	**>80**	**F**	**>80**	**F**
12	Third/Le Conte/US 101 nb off	23	C	24	C
19	Bayshore Blvd/Paul Ave	**>80**	**F**	**>80**	**F**
27	Alana Way/Beatty Ave [3]	**>80**	**F**	**>80**	**F**
28	Alana Way/Harney Way/Mellon [3]	**>80**	**F**	**>80**	**F**
29	Harney Way/Jamestown Ave [4]	41	D	**>80**	**F**
34	A.Walker/Gilman Ave [4]	36	D	37	D
56	Third/Williams/Van Dyke	**>80**	**F**	**>80**	**F**
57	Third St/Jerrold Ave	**>80**	**F**	**>80**	**F**
59	Harney Way/Executive Park East	26	C	30	C
60	Harney Way/Thomas Mellon	26	C	42	D

Notes:
1. Delay in seconds per vehicle.
2. Intersections operating at LOS E or LOS F conditions highlighted in **bold.**
3. Year 2030 analysis includes signalization as part of Executive Park Development or new Harney Interchange.
4. Year 2030 analysis includes signalization as part of Project.

Source: Fehr & Peers.

During the weekday PM peak hour, the LOS at the intersection of Harney/Jamestown would change from LOS D under Project conditions without an event to LOS F conditions for Project conditions with an event. This would be a significant impact.

Additionally, traffic associated with a sell-out arena event would exacerbate traffic operations at 11 intersections that would operate at LOS E or LOS F conditions under Project conditions without an event, including:

- Third/25th
- Third/Cesar Chavez
- Third/Evans

- Third/Oakdale
- Third/Revere
- Third/Carroll
- Third/Jamestown
- Alana Way/Beatty
- Alana Way/Harney/Mellon
- Third/Williams/Van Dyke
- Third/Jerrold

Overall, since local streets and freeway facilities would experience increased congested prior to an arena event, traffic impacts associated with the new arena would be *significant.*

> ***Project Mitigation Measure 21***: The arena operator shall develop a Transportation Management Plan (TMP) for coordinating with representatives of SFMTA and the SF Police Department for deploying traffic control officers in the Project vicinity to increase efficiency of pre- and post- event traffic, and for developing incentives to increase transit ridership to the arena. Implementation of this mitigation measure would likely speed vehicle entrance and exit to the arena site as well as maintain orderly traffic operations and reduce intrusion onto minor routes to and from the arena. Traffic control officers would facilitate traffic flow at the intersection of Harney/Jamestown that would operate at LOS F conditions with a sell-out arena event. The final arena TMP shall be approved by SFMTA. Preparation of the TMP Plan shall be fully funded by the arena operator, and shall be completed in time for implementation on opening day of the arena.

However, even with the implementation of Project Mitigation Measure 21, the Project's impacts to the study roadway network during a sell-out event at the arena would be *significant and unavoidable*.

Transit Impacts

Arena events would be served by the existing and proposed transit routes serving Candlestick Point. Additional transit service is not planned as part of special events at the arena. As shown in **Table 100,** the total one-way transit capacity serving the stadium site during a typical weekday PM peak hour would be 2,278 passengers per hour.

Table 100
PM Peak Hour One-Way Muni Capacity to Arena by Line

Route	Peak Hour Frequency (minutes)	One-Way Hourly Capacity (passengers per hour)
29-Sunset	5	768
28L-19th Avenue/Geneva Avenue	5	1,130
CPX – Candlestick Point Express	10	380
Total		**2,278**

Notes:
Source: SFMTA, Fehr & Peers.

As presented in the travel demand section, up to 1,000 transit riders would be generated in the peak hour prior to an event. These would be added to the 1,023 transit trips inbound to the project study area in the PM peak hour (i.e., inbound trips to Candlestick Point and Hunters Point Shipyard) on routes serving the arena (Routes 29-Sunset, 28L-19th Avenue Limited, and the proposed CPX service). Therefore, the overall one-way transit demand in the PM peak hour on days when an event is being held at the arena could be up to 2,023.

During the weekday evening period, up to 1,000 transit riders would be generated in the peak hour prior to an event. These would be added to the 1,023 transit trips inbound to the study area during the PM peak hour on routes serving the arena (e.g., 29-Sunset, 28L-19th Avenue Limited, and the proposed CPX service). Therefore, the overall one-way transit demand in the PM peak hour on days when an event is being held at the arena could be up to 2,023. As shown in Table 97, the total one-way transit capacity serving the arena during a typical weekday PM peak hour would be 2,278 passengers per hour, which would be adequate to serve the arena event and background demand generated by the Project land uses.

As described above, traffic associated with a sell-out event at the arena would add to already congested conditions on the study area roadway network, and these conditions could not be mitigated to less-than-significant levels. Therefore, traffic impacts would impact transit service accessing the Project site. Providing transit-priority treatments on Gilman Avenue, as described in Mitigation Measure 10.1 would reduce travel time impacts on the 29-Sunset (the 28L-19th Avenue/Geneva Avenue and the CPX would be traveling with the proposed transit-only lanes and would not be subject to increased traffic congestion).

The impact of traffic congestion on transit service could be avoided with implementation of Project Mitigation Measure 10.1 (Gilman transit lanes). Implementation of this mitigation measure would reduce impacts on transit operations to less-than-significant. However, due to the uncertainty of this mitigation, the impact would remain *significant and unavoidable*.

Bicycle Impacts

During arena events, bicyclists would have access to the proposed bicycle facilities on existing and reconfigured roadways, as it is not anticipated that any special roadway network restrictions would be required to accommodate arena event traffic. Bicycle impacts would be similar to those described for the Project.

For those patrons arriving to the arena by bicycle, the arena would include bicycle racks and lockers would be provided at the stadium entrances. Overall, while traffic volumes on area roadways would increase during arena events, the increase would not be sufficient to affect bicycle circulation, and impacts on bicycle operations would therefore be less than significant.

Pedestrian Impacts

In the vicinity of the arena, 12- to 15-foot-wide sidewalks would be provided. In addition, the arena would be set back from the street to provide a pedestrian plaza area for gathering pedestrians. Pedestrian access to the arena events would be accommodated within the proposed sidewalk network, although due to large number of pedestrians and vehicles accessing the arena during a sell-out event, pedestrians may experience crowding. However, this is expected and would be managed during large events by the arena operator. Therefore, arena event impacts on pedestrian circulation would be *less than significant.*

Parking Impacts

No separate parking facilities would be provided for arena patrons. Visitors would utilize proposed public off-street and on-street parking spaces in the vicinity of the proposed arena. A sell-out arena event would generate a demand for 2,860 vehicles (including patrons and employees), which would be accommodated within the approximately 2,300 parking spaces within structured parking in Candlestick Point, and within the approximately 1,000 on-street parking spaces in the Candlestick Point North, South and Central areas. See **Figure 10.**

During the weekday evenings, parking demand associated with the commercial uses in Candlestick Point that would utilize the public parking garage would be less than during the day, and spaces would be available for arena events. There would generally be a shortfall in parking supply, compared to Project parking demand, and therefore depending on the time of day of the arena event, surplus capacity may not be available to accommodate the arena parking demand. Arena events during peak periods of commercial activity would increase the shortfall in parking spaces. It is possible that some drivers may seek available parking in the available Bayview area, or others may shift to transit. As discussed above, the secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to some drivers, who are aware of constrained parking conditions in a given area, shifting to other modes. Hence, any secondary environmental impacts that may result from a shortfall in parking would be minor. Therefore, the parking shortfall would not result in significant parking impacts, and Project impacts on parking would be *less than significant.*

Project Variants

Project Variants 1 and 2 would each include somewhat more development in the Hunters Point area and development in the Candlestick Point area would be the same as the Project, including construction of a 10,000-seat arena. Overall, since new facilities, including local streets and freeway facilities, would experience congested traffic prior to an arena event, traffic impacts associated with the new Arena during arena events would be *significant*. Implementation of Project Mitigation Measure 21 would be applicable to Project Variants 1 and 2. However, even with the implementation of Project Mitigation Measure 21, the Project Variants 1 and 2's impacts to the study roadway network during a sell-out event at the arena would be *significant and unavoidable*.

As described earlier, transit demand with a sold-out arena event under the Project conditions were approaching, but not above, the amount of available transit capacity. However, since the amount of background transit demand under Variants 1 and 2 would be higher, it is possible that the added transit demand associated with a sold-out arena event would create demand for transit service greater than the capacity of the transit supply to the arena.

> ***Project Variant 1 Mitigation Measure 20 and Project Variant 2 Mitigation Measure 18***: SFMTA shall increase frequency on regularly scheduled Muni routes serving the stadium area prior to large events at the arena. Routes 29-Sunset and 28L-19th Avenue Limited would already be operating near their maximum frequency. Therefore, this mitigation measure primarily applies to Route CPX. If headways on this route were increased to five-minute frequencies in the one to two-hours prior to an event at the arena, the hourly transit capacity toward the arena would increase by 380 passengers per hour, for a total of 2,658. This would likely be adequate capacity, but may still leave some routes over-capacity and others below-capacity. Therefore, additional shuttle service to key regional transit destinations, such as BART, Caltrain, and the T-Third light rail route shall also be provided by the arena operator.

With implementation of Project Variant 1 Mitigation Measure 20 and Project Variant 2 Mitigation Measure 18, the Project's impacts to transit service during sell-out events at the arena would be reduced, but not to less-than-significant levels. In addition, traffic impacts during secondary events would not be mitigated, and would impact transit operations. Therefore, the impact on transit operations would remain *significant and unavoidable.*

Alternatives to the Project

Alternative 1 – No Project: Under No Project conditions, an arena would not be constructed. No impacts related to arena events.

Alternative 2 – No Bridge: Since arena traffic would not be able to use the Yosemite Slough bridge, conditions with a special event at the arena under Alternative 2 would be the same to those as for the Project. Implementation of Project Mitigation Measure 21 would be applicable to Alternative 2. However, even with the implementation of Project Mitigation Measure 21, the Alternative 2's impacts to the study roadway network during a sell-out event at the arena would be *significant and unavoidable*.

Alternative 3 – 49ers at Candlestick: Under Alternative 3, no arena would be constructed. There would be no special events at an arena. *No impact.*

Alternative 4 – Lesser Build: Alternative 4 would include the arena, but would have less overall development than the Project. Implementation of Project Mitigation Measure 21 would be applicable to Alternative 4. However, even with the implementation of Project Mitigation Measure 21, the Alternative 4's impacts to the study roadway network during a sell-out event at the arena would be *significant and unavoidable*.

Alternative 5 – No Park Agreement: Alternative 5 would be similar to Project Variant 2. Implementation of Project Mitigation Measure 21 would be applicable to Alternative 5. However, even with the implementation of Project Mitigation Measure 21, the Alternative 5's impacts to the study roadway network during a sell-out event at the arena would be *significant and unavoidable*.

Chapter 7
MITIGATION MEASURES

This chapter presents the transportation mitigation measures to reduce the impacts of the 2030 No Project, Project, Project Variants, and Alternatives to the Project. It also identifies locations where mitigation measures would not be feasible and therefore impacts would remain significant and unavoidable.

7.1 PROJECT

7.1.1 Traffic

Project Mitigation Measure 1: TDM Plan

The Project Applicant shall prepare and implement a final TDM plan, which shall include the following elements:

- Visitor Variable, Market-Rate Parking Pricing
- Maximum Permitted Parking Ratios
- Flexible Parking Management Strategies
- Unbundled Residential Parking
- Transit Strategies and Support Strategies
- Central Transit Hub
- Enhanced Transit Service and Bicycle Facilities
- Bicycle Support Facilities
- Wayfinding Signs
- EcoPass for Residents
- Carshare Services
- Employee TDM Programs
    - Information Boards/Kiosks
    - In-building Real-Time transit monitors with sightlines of transit hubs
    - Commuter Benefits
    - Employee EcoPass
    - Carpool/Vanpools
    - Guaranteed Ride Home Program
    - Compressed Work Weeks, Flex Time, and Telecommuting
- CP-HPS Transportation Management Association
- On-Site Transportation Coordinator and Website
- Targeted Marketing
- Monitoring of Transportation Demand
- Monitoring Effectiveness of Congestion-Reducing and Traffic-Calming Efforts

With implementation of the Project Mitigation Measure 1, alternative modes would be encouraged, the use of single-occupant vehicles would be discouraged, and the impact of additional vehicles generated by the Project would be lessened. However, as described in Impact discussions below, the Project would still result in significant and unavoidable impacts on traffic and transit operations, and would still make considerable contributions to cumulative impacts related to substantial increases in traffic. Thus, the Project and Project's contribution to traffic would remain *significant and unavoidable.*

Project Mitigation Measure 2: Intersection of Tunnel/Blanken

Reconfigure the northbound and southbound approaches to the intersection of Tunnel/Blanken to provide dedicated left-turn lanes adjacent to shared through/right-turn lanes. This reconfiguration would require prohibition of parking for 160 feet in the southbound approach (loss of eight parking spaces) and for 100 feet in the northbound approach (loss of five parking spaces).

Implementation of the intersection reconfiguration shall be the responsibility of SFMTA, and shall be implemented when intersection improvements associated with the Visitacion Valley Redevelopment Plan (i.e., signalization) are no longer sufficient to maintain acceptable intersection level of service conditions. Since these improvements were determined to be required even without the Project under 2030 No Project conditions, the Project Applicant shall contribute its fair-share toward the cost of improvements. Prior to payment of the contribution, the City shall create a mechanism to determine and receive fair share contributions from the Project Applicant. The SFMTA and DPW shall design and implement the measure as necessary.

With implementation of ***Project Mitigation Measure 2***, operations at this intersection would improve, but not to acceptable LOS D or better conditions in the AM and PM peak hours. Therefore, project-related impacts at this intersection would be *significant and unavoidable*.

Project Mitigation Measure 3: Harney Interchange Project

The City of Brisbane and Caltrans, as part of the Harney Interchange Project, shall account for existing traffic, background traffic growth, and the most recent forecasts of traffic expected to be associated with each of several adjacent development projects, including the Project. The San Francisco County Transportation Authority (SFCTA) shall coordinate with the City of Brisbane and Caltrans to ensure Project-generated vehicle trips are accounted for in the Harney Interchange analyses and design.

Mitigations and associated fair-share funding measures for cumulative regional roadway system impacts, including freeway segment impacts, shall be formulated through the current interjurisdictional Bi-County Transportation Study effort being led by the SFCTA. The Project Applicant shall contribute its fair share to the Harney Interchange Project.

Because the environmental review of the interchange project is not yet complete and the interchange would be approved by Caltrans, the implementation of **Project Mitigation Measure 3** is uncertain and is outside of the City/Agency jurisdiction. Therefore, Project-related contributions to cumulative traffic impacts at these two intersections would remain *significant and unavoidable*.

Project Mitigation Measure 4: Intersection of Amador/Cargo/Illinois

SFMTA shall conduct a feasibility study of the intersection of Amador/Cargo/Illinois with the Port of San Francisco to determine the feasibility of reconfiguring the southbound approach on Illinois Street to provide a dedicated southbound left turn lane and a dedicated right-turn lane. Sufficient right-of-way is available to implement this improvement, however, provision of two southbound lanes would require narrowing a portion of the island to the west of the southbound approach to Cargo Way. Implementation of the intersection improvements shall be the responsibility of SFMTA and the Port of San Francisco, and shall be implemented when traffic operating conditions with the existing intersection configuration worsens to unacceptable levels. If determined feasible, the Project Applicant shall contribute its fair share to the intersection improvements.

With implementation of Project Mitigation Measure 4, operations at this intersection would improve to acceptable LOS C conditions during the AM and PM peak hours. However, since a feasibility study would be required, implementation of Mitigation Measure 3 is uncertain, and therefore, Project-related impacts at this intersection would remain *significant and unavoidable.*

Project Mitigation Measure 5: Intersection of Bayshore/Geneva

The City of Brisbane, as part of the Geneva Avenue Extension Project, shall account for existing traffic, background traffic growth, and the most recent forecasts of traffic expected to be associated with each of several adjacent development projects, including the Project. The San Francisco County Transportation Authority (SFCTA) and SFMTA shall coordinate with the City of Brisbane to ensure projected traffic volumes are accounted for in the design of the Geneva Avenue Extension.

Mitigations and associated fair-share funding measures for cumulative regional roadway system impacts, including freeway segment impacts, shall be formulated through the current interjurisdictional Bi-County Transportation Study effort being led by the SFCTA. The Project Applicant shall contribute its fair share to the Geneva Avenue Extension Project.

Since implementation of Project Mitigation Measure 5 would be under the jurisdiction of the City of Brisbane, the implementation of the mitigation measure is uncertain. Therefore, the Project-related impacts at this intersection would remain *significant and unavoidable.*

Project Mitigation Measure 6: Harney Way Widening

Prior to issuance of the grading permit for Phase II of the Project, the Project Applicant shall widen Harney Way as shown in **Figure 5.** Prior to the issuance of grading permits for Phases II, III and IV, the Project Applicant shall fund a study to evaluate traffic conditions on Harney Way and determine whether additional traffic associated with the next phase of development would result in the need to modify Harney Way to its ultimate configuration, as shown in **Figure 6,** unless this ultimate configuration has already been built. This study shall be conducted in collaboration with the SFMTA, which would be responsible for making final determinations regarding the ultimate configuration. The ultimate configuration would be linked to intersection performance, and it would be required when study results indicate intersection LOS at one or more of the three signalized intersection on Harney Way at mid-LOS D (i.e., at an average delay per vehicle of more than 45 seconds per vehicle). If the study and SFMTA conclude that reconfiguration would be necessary to accommodate traffic demands associated with the next phase of development, the Project Applicant shall be responsible to fund and complete construction of the improvements prior to occupancy of the next phase.

With implementation of the Project Mitigation Measure 6, Harney Way would be widened and improved to its final configuration when traffic demand warrants additional capacity. Therefore, potential Project impacts and Project contribution to cumulative impacts on traffic capacity on Harney Way would be reduced to *less than significant*.

7.1.2 Transit

Project Mitigation Measure 7: Transit Operating Plan

The Project Applicant shall work with SFMTA to develop and implement the Project's Transit Operating Plan. Elements of the Project Transit Operating Plan shall include:

- Extension of the 24-Divisadero, the 44-O'Shaughnessy, and the 48-Quintara-24th Street into Hunters Point Shipyard.
- Increased frequency on the 24-Divisadero to 6 minutes in the AM and PM peak periods. Extension of the 29-Sunset from its current terminus near the Alice Griffith housing development, near Gilman Avenue and Giants Drive, into the proposed Candlestick Point retail area. The 29-Sunset would operate a short line between Candlestick Point and the Balboa Park BART station. This would increase frequencies on the 29-Sunset by reducing headways between buses from 10 minutes to 5 minutes during the AM and PM peak periods between Candlestick Point and the Balboa BART station. Every other bus would continue to serve the Sunset District (to the proposed terminus at Lincoln Drive and Pershing Drive in the Presidio) at 10-minute headways.
- Convert T-Third service between Bayview and Chinatown via the Central Subway from one-car to two-car trains or comparable service improvement.
- Extension of the 28L-19th Avenue Limited from its TEP-proposed terminus on Geneva Avenue, just east of Mission Street, into the Hunters Point Shipyard transit center. The

28L-19th Avenue Limited would travel along Geneva Avenue across U.S. 101 via the proposed Geneva Avenue extension and new interchange with U.S. 101, to Harney Way. East of Bayshore Boulevard, the 28L-19th Avenue Limited would operate as BRT, traveling in exclusive bus lanes into the Candlestick Point area. The BRT route would travel through the Candlestick Point retail corridor, and cross over Yosemite Slough into the Hunters Point Shipyard transit center.

- The 28L-19th Avenue Limited would operate a short line to the Balboa Park BART station. This would increase frequencies on the 28L-19th Avenue Limited by reducing headways between buses from 10 minutes to 5 minutes for the segment between Hunters Point Shipyard and the Balboa Park BART station. Every other bus would continue to the Sunset District (to the proposed terminus at North Point Street and Van Ness Avenue) at 10-minute headways. If the TEP-proposed extension of the 28L has not been implemented by the SFMTA by Phase 2 of Project development, the Project Applicant shall fund the extension of that line between its existing terminus and Bayshore Boulevard.
- New CPX-Candlestick Express to downtown serving the Candlestick Point site, traveling along Harney Way (with potential stops at Executive Park), before traveling on U.S. 101 toward downtown, terminating at the Transbay Terminal.
- New HPX-Hunters Point Shipyard Express to downtown serving the Hunters Point Shipyard site, traveling from the Hunters Point Shipyard Transit Center, along Innes Avenue, with stops at the India Basin and Hunters View areas, before continuing along Evans Avenue to Third Street, eventually entering I-280 northbound at 25th/Indiana. The HPX would continue non-stop to the Transbay Terminal in Downtown San Francisco.

Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources. With implementation of the Transit Plan, Project-generated transit trips would be accommodated within the existing and proposed transit capacity, and therefore Project impacts on transit capacity would be *less than significant.*

Project Mitigation Measures 8.1 and 8.2: 9-San Bruno

<u>Project Mitigation Measure 8.1:</u> To address Project impacts to the 9-San Bruno, prior to issuance of a grading permit for Phase 1, the Project Applicant in cooperation with SFMTA shall conduct a study to evaluate the effectiveness and feasibility of the following improvements which could reduce Project impacts on transit operations along the San Bruno Avenue corridor, generally between Campbell Avenue and Silver Avenue. The study shall create a monitoring program to determine the implementation extent and schedule (as identified below) to maintain the proposed headways of the 9-San Bruno.

- Install a transit-only lane on northbound San Bruno Avenue for the one-block section (400 feet) between Silliman Street and Silver Avenue. This would involve removal of five metered spaces on the east side of San Bruno Avenue, just south of Silver Avenue. Treatment for transit-only lanes can range from striping to physical elevation changes or barriers to protect transit right-of-way from mixed-flow traffic.

- Install a transit-only lane on southbound San Bruno Avenue at the approach to Dwight Street/Paul Avenue. This lane would function as a so-called "queue-jump" lane, allowing buses to bypass queues on southbound San Bruno Avenue at the intersection. The lane should begin approximately 200 feet north of Dwight Street and extend one block (about 300 feet) south of Paul Avenue to Olmstead Street. This would involve the removal of up to 20 on-street parking spaces on the west side of San Bruno Avenue. This treatment could be limited to peak hours only, which would minimize the impact of the parking loss. The segment of San Bruno Avenue between Dwight Street and Olmstead Street is designated as Bicycle Routes #705 and 5 (Class III signed routes).
- At the intersection of San Bruno/Silver install signal priority treatments on westbound Silver Avenue, where buses waiting to turn left from Silver Avenue onto southbound San Bruno Avenue must currently wait through almost an entire signal cycle due to the heavy oncoming traffic on eastbound Silver Avenue. Installation of a transit signal pre-emption at this location that provides a "green" signal for westbound vehicles but holds eastbound vehicles when buses are present would allow transit vehicles to turn left onto San Bruno Avenue without having to wait for opposing eastbound through traffic to clear.

The Project Applicant shall fully fund the costs of implementing the transit priority improvements (either the improvements identified above, or alternative improvements of equal or greater effectiveness and comparable cost) as determined by the study and the monitoring program. Other options to be evaluated in the study could include comprehensive replacement of stop-controlled intersections with interconnected traffic signals equipped with transit priority elements.

<u>Project Mitigation Measure 8.2</u> - Should Project Mitigation Measure 8.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the 9-San Bruno. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Because a feasibility study of the improvements contemplated in mitigation measure Project Mitigation Measure 8.1 would be required, implementation of Project Mitigation Measure 8.1 is uncertain. Because implementation of Project Mitigation Measure 8.2 alone, without Project Mitigation Measure 8.1, might not be sufficient to reduce the impacts on the 9-San Bruno to a less than significant level, the Project impacts on the 9-San Bruno would remain *significant and unavoidable.*

Project Mitigation Measures 9.1 and 9.2: 23-Monterey, 24-Divisadero, 4-O'Shaughnessy

Project Mitigation Measure 9.1: To address Project impacts to the 23-Monterey, 24-Divisidero and the 44-O'Shaughnessy, prior to issuance of a grading permit for Phase 1, the Project Applicant in cooperation with SFMTA shall conduct a study to evaluate the effectiveness and feasibility of the following improvements which could reduce Project impacts on transit operations along the Palou Avenue corridor, generally between Griffith Street and Newhall Street. The study shall create a monitoring program to determine the implementation extent and schedule (as identified below) to maintain the proposed headways of the 23-Monterey, 24-Divisidero and the 44-O'Shaughnessy.

- Convert one of the two westbound travel lanes on Palou Avenue between Keith Street and Newhall Street (three blocks) to a transit-only lane at all times. Treatment for transit-only lanes can range from striping to physical elevation changes to protect right-of-way from mixed-flow traffic. Because the westbound lanes between Third Street and Newhall Street are relatively narrow, parking would likely need to be prohibited on the north side of Palou Avenue between Third Street and Newhall Street (approximately 600 feet) during peak periods to maximize the effectiveness of the transit-only lane.
- Convert one of the two eastbound travel lanes on Palou Avenue between Newhall Street and Third Street (one block) to a transit-only lane at all times. Because the eastbound travel lanes between Newhall Street are relatively narrow, parking would likely need to be prohibited on the south side of Palou Avenue between Newhall Street and Third Street (approximately 600 feet) during peak periods to maximize the effectiveness of the transit-only lane. In the eastbound direction, east of Third Street, buses would re-enter the single mixed-flow traffic lane at the bus stop on the far (east) side of Third Street.
- There are currently pedestrian corner bulbs on the northwest and southwest corners of the intersection of Palou Avenue and Third Street. In order to accommodate the transit-only lanes west of Third Street, these bulbouts would be reconfigured or removed. Although removing pedestrian bulb-outs may increase pedestrian crossing distances and is generally inconsistent with the City's desire to prioritize pedestrian activity, in this case, the improvement would offer substantial benefits to transit travel times by allowing a transit-only lane through a congested intersection. This would be consistent with the City's transit-first policy.
- During the PM peak period only, prohibit parking on westbound Palou Avenue for the four-block segment between Griffith Street/Crisp Avenue and Keith Street, to provide for a PM peak period curb transit-only lane along this segment. This would create a continuous westbound transit-only lane on Palou Avenue between Griffith Street/Crisp Avenue and Newhall Street during the PM peak period.

- As an alternative to the bulleted measures above, narrow the existing sidewalks on Palou Avenue from Third Street to Crisp Avenue (seven blocks) from 15 feet to 12 feet in width. The pedestrian bulb-outs on the west side of Third Street would be removed. The resulting 12-foot-wide sidewalks would be consistent with the Better Streets Plan guidelines. The reduction in sidewalk width would allow for the provision of a 7-foot-wide on-street parking lane, an 11-foot-wide transit-only lane, and a 10-foot-wide mixed-flow lane in each direction on Palou Avenue. This would preserve on-street parking along the corridor and provide a seven-block transit-only lane on Palou Avenue between Griffith Street/Crisp Avenue and Newhall Street. Treatment for transit-only lanes can range from striping to physical elevation changes to protect right-of-way from mixed-flow traffic.

The Project Applicant shall fully fund the costs of implementing the transit priority improvements (either the improvements identified above, or alternative improvements of equal or greater effectiveness and comparable cost) as determined by the study and the monitoring program. Other options to be evaluated in the study could include signal priority treatments at other signalized intersections including at Bayshore/Cortland, Bayshore/Industrial, and Bayshore/Oakdale.

<u>Project Mitigation Measure 9.2:</u> Should Project Mitigation Measure 9.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the 23-Monterey, the 24-Divisadero and the 44-O'Shaughnessy. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Because a feasibility study of the improvements contemplated in Project Mitigation Measure 9.1 would be required, implementation of this measure is uncertain. Because implementation of Project Mitigation Measure 9.2 alone, without Project Mitigation Measure 9.1, might not be sufficient to reduce the impacts on the 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy to a less than significant level, the Project impacts on the 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy would remain *significant and unavoidable.*

Project Mitigation Measures 10.1 and 10.2: 29-Sunset

<u>Project Mitigation Measure 10.1:</u> To address Project impacts to the 29-Sunset, prior to issuance of a grading permit for Phase I, the Project Applicant in cooperation with SFMTA shall conduct a study to evaluate the effectiveness and feasibility of the following improvements which could reduce Project impacts on transit operations along the Gilman Avenue and Paul Avenue corridor,

generally between Arelious Walker Drive and Bayshore Boulevard. The study shall create a monitoring program to determine the implementation extent and schedule to maintain the proposed headways of the 29-Sunset.

- For the five-block segment of Gilman Avenue between Arelious Walker Drive and Third Street, prohibit on-street parking on westbound Gilman Avenue during the AM and PM peak periods to provide for three westbound travel lanes. During the peak periods convert one of the three westbound travel lanes to transit-only. During off-peak periods, parking would be allowed, and buses would travel in one of the two mixed-flow lanes. The peak period transit lanes would impact 90 parking spaces.
- For the same five-block segment of Gilman Avenue between Arelious Walker Drive and Third Street, restripe the eastbound direction to provide two travel lanes, one of which would accommodate on-street parking and one of which would be a mixed-flow travel lane. During the AM and PM peak periods, prohibit on-street parking in the eastbound direction, and operate one of the two eastbound lanes as transit-only lanes. The peak period transit lanes would impact 80 parking spaces.
- As an alternative to the two bulleted measures above, narrow the existing sidewalks on Gilman Avenue from Third Street to Griffith Street (four blocks) from 15 feet to 12 feet in width. The resulting 12-foot-wide sidewalks would be consistent with the Better Streets Plan guidelines. The reduction in sidewalk width would allow for the provision of a 7-foot-wide on-street parking lane, an 11-foot-wide transit-only lane, and a 10-foot-wide mixed-flow lane in each direction on Gilman Avenue. This would preserve on-street parking along the corridor and provide four-block transit-only lanes on Gilman Avenue between Griffith Street and Third Street. Treatment for transit-only lanes can range from striping to physical elevation changes to protect right-of-way from mixed-flow traffic.
- Prohibit on-street parking on the north side of Paul Avenue, between Third Street and Bayshore Boulevard to create two westbound through lanes. Convert one westbound through lane to transit-only in the AM and PM peak periods. The peak period transit-only lane would impact 40 parking spaces. At the intersection of Paul Avenue and Bayshore Avenue, provide transit signal priority treatment (i.e., queue jump) to allow transit vehicles to maneuver into the mixed flow left-hand lane, facilitating a left-turn movement immediately west of Bayshore Boulevard from westbound Paul Avenue to southbound San Bruno.

The Project Applicant shall fully fund the costs of implementing the transit priority improvements (either the improvements identified above, or alternative improvements of equal or greater effectiveness and comparable cost) as determined by the study and the monitoring program. Other options to be evaluated in the study could include transit priority treatments on San Bruno Avenue, on the portions where the 29-Sunset travels.

Project Mitigation Measure 10.2: Should Project Mitigation Measure 10.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the 29-Sunset. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Because a feasibility study of the improvements contemplated in mitigation measure Project Mitigation Measure 10.1 would be required, implementation of Project Mitigation Measure 10.1 is uncertain. Because implementation of Project Mitigation Measure 10.2 alone, without Project Mitigation Measure 10.1, might not be sufficient to reduce the impacts on the 29-Sunset to a less than significant level, the Project impacts on the 29-Sunset would remain *significant and unavoidable.*

Project Mitigation Measures 11.1 and 11.2: 48-Quintara-24th Street

Project Mitigation Measure 11.1: To address Project impacts to the 48-Quintara-24th Street, prior to issuance of a grading permit for Phase I, the Project Applicant in cooperation with SFMTA shall conduct a study to evaluate the effectiveness and feasibility of the following improvements which could reduce Project impacts on transit operations along the Evans Avenue corridor, generally between Hunters Point Boulevard and Napoleon Street. The study shall create a monitoring program to determine the implementation extent and schedule (as identified below) to maintain the proposed headways of the 48-Quintara-24th Street.

- On Evans Avenue, between Jennings Street and Napoleon Street (a nine-block segment—about 6,000 feet), convert one of the two travel lanes in each direction to a transit-only lane at all times. Treatment for transit-only lanes can range from striping to physical elevation changes or barriers to protect transit right-of-way from mixed-flow traffic.

The Project Applicant shall fully fund the costs of implementing the transit priority improvements (either the improvements identified above, or alternative improvements of equal or greater effectiveness and comparable cost) as determined by the study and the monitoring program. Other options to be evaluated in the study could include extension of transit only lanes in one or both directions between Napoleon Street and Cesar Chavez Street or onto Hunters Point Boulevard and Innes Avenue.

Project Mitigation Measure 11.2: Should Project Mitigation Measure 11.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the 48-Quintara-24th Street. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Because a feasibility study of the improvements contemplated in Project Mitigation Measure 11.1 would be required, implementation of Project Mitigation Measure 11.1 is uncertain. Because implementation of Project Mitigation Measure 11.2 alone, without Project Mitigation Measure 11.1, might not be sufficient to reduce the impacts on the 48-Quintara-24th Street to a less than significant level, the Project impacts on the 48-Quintara-24th Street would remain *significant and unavoidable.*

Project Mitigation Measure 12: 54-Felton

SFMTA shall purchase additional transit vehicles and contribute to operating costs and facility improvements to mitigate the Project impacts and Project contribution to cumulative impacts to headways on 54-Felton. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

While the provision of additional transit vehicles for the 54-Felton would reduce impacts associated with increased travel times, the transit vehicles would still be subject to delays resulting from increased congestion, and therefore Project impacts on the 54-Felton would remain *significant and unavoidable.*

Project Mitigation Measures 13.1 and 13.2: T-Third

Project Mitigation Measure 13.1: To address Project impacts to the T-Third, prior to issuance of a grading permit for Phase I, the Project Applicant in cooperation with SFMTA shall conduct a study to evaluate the effectiveness and feasibility of the following improvement that could reduce Project impacts on transit operations along Third Street between Thomas Avenue and Kirkwood Avenue. The study shall create a monitoring program to determine the implementation extent and schedule (as identified below) to maintain the proposed headways of the T-Third.

- Reconfigure the section of Third Street between Thomas Avenue and Kirkwood Avenue (9 blocks) where the light rail vehicles currently share the travel lane with auto traffic to provide a dedicated transit right-of-way, consistent with the rest of the route. This would require either removal of one travel lane in each direction on Third Street, or removal of on-street parking and some sidewalk bulbouts. In addition, left-turns from Third Street in this segment would be restricted in both directions. Treatment for transit-only lanes can range from striping to physical elevation or barriers to protect transit right-of-way from mixed-flow traffic.

Implementation of the intersection reconfiguration shall be the responsibility of SFMTA, and shall be implemented when the results of the study described above indicate transit improvements are necessary. The Project Applicant shall fully fund the costs of implementing the transit priority improvements prior to approval of subsequent phases of development.

Project Mitigation Measure 13.2: Should Project Mitigation Measure 13.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the T-Third. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Because a feasibility study of the improvements contemplated in Project Mitigation Measure 13.1 would be required, implementation of Project Mitigation Measure 13.1 is uncertain. Because implementation of Project Mitigation Measure 13.2 alone, without Project Mitigation Measure 13.1, might not be sufficient to reduce the impacts on the T-Third to a less than significant level, the Project impacts on the T-Third would remain *significant and unavoidable.*

Project Mitigation Measures 14.1 and 14.2: 28L-19th Avenue/Geneva Limited

Project Mitigation Measure 14.1: The City of Brisbane, as part of the Geneva Avenue Extension Project, shall account for existing traffic, background traffic growth, and the most recent forecasts of traffic expected to be associated with each of several adjacent development projects, including the Project. The San Francisco County Transportation Authority (SFCTA) and SFMTA shall coordinate with the City of Brisbane to ensure transit preferential treatment is accounted for in the design of the Geneva Avenue Extension.

Project Mitigation Measure 14.2: Should Project Mitigation Measure 14.1 not be feasible or effective, the Project Applicant shall work with SFMTA to purchase additional transit vehicles and contribute to operating costs and facility improvements as necessary to mitigate the Project impacts and Project contribution to cumulative impacts to headways on the 28L-19th Avenue/Geneva Limited. Funds for the implementation of this mitigation measure are expected to be generated from a combination of Project revenues that accrue to the City, and other funding sources not otherwise accessible to Muni, adequate and sufficient to provide for SFMTA's associated ongoing operating costs, transit vehicle capital costs, and facility costs to store and maintain these vehicles.

Since implementation of Project Mitigation Measure 14.1 would be under the jurisdiction of the City of Brisbane, the implementation of the mitigation measure is uncertain. Because implementation of Project Mitigation Measure 14.2 alone, without Project Mitigation Measure

14.1, might not be sufficient to reduce the impacts on the 28L-19th Avenue/Geneva Limited to a less than significant level, the Project impacts on the 28L-19th Avenue/Geneva Limited would remain *significant and unavoidable.*

7.1.3 Bicycle

Project Mitigation Measure 15: Bicycle Routes #70 and #170 on Palou Avenue

Prior to issuance of the grading permit for Phase I, the Project Applicant shall fund a study to determine the feasibility of relocating Bicycle Routes #70 and #170. The study of the bicycle route relocation, necessary environmental clearance documentation, and implementation shall be the responsibility of SFMTA. Since the feasibility of the relocation of the routes is uncertain at this time, the Project impact on bicycle circulation on Palou Avenue would remain significant and unavoidable.

Because a feasibility study of the relocation of Bicycle Routes #70 and #170 on Palou Avenue would be required, the implementation of Project Mitigation Measure 15 is uncertain, and therefore the Project impact on bicycle circulation would remain *significant and unavoidable*.

7.1.4 Pedestrian

No significant environmental impacts have been identified; no mitigation required.

7.1.5 Parking

No significant environmental impacts have been identified; no mitigation required.

7.1.6 Loading

No significant environmental impacts have been identified; no mitigation required.

7.1.7 Construction

Project Mitigation Measure 16: Construction Traffic Management Program

The Project Applicant shall develop and implement a Candlestick Point–Hunters Point Shipyard Phase II Construction Traffic Management Program to minimize impacts of the Project and its contribution to cumulative impacts related to construction activities and construction traffic. The program shall provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementing construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. The program shall supplement and expand, rather than modify or supersede any manual, regulations, or provisions set forth by SFMTA, DPW or other City departments and agencies.

Preparation of the Construction Management Program shall be the responsibility of the Project Applicant, and shall be reviewed and approved by SFMTA and DPW prior to initiation of construction. The Project Applicant shall update the program prior to approval of development plans for Phase 2, Phase 3 and Phase 4 of construction to reflect any change to Project development schedule, reflect transportation network changes, to update status of other development construction activities, and to reflect any changes to City requirements.

The program shall:

- Identify construction traffic management practices in San Francisco, as well as other jurisdictions that although not being implemented in the City could provide useful guidance for a project of this size and characteristics.
- Describe procedures required by different departments and/or agencies in the City for implementation of a construction management plan, such as reviewing agencies, approval process, and estimated timelines.
- Describe coordination efforts associated with the Navy remediation efforts and scheduling regarding construction vehicle routing via the Crisp gate.
- Identify construction traffic management strategies and other elements for the Project, and present a cohesive program of operational and demand management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities in the Bayview Hunters Point area. These could include construction strategies, demand management strategies, alternate route strategies, and public information strategies.
- Coordinate with other projects in construction in the immediate vicinity, so that they can take an integrated approach to construction-related traffic impacts.
- Present guidelines for selection of construction traffic management strategies.

Implementation of Project Mitigation Measure 16 would help minimize the Project construction-related transportation impacts, and the Project's contribution to cumulative-construction related transportation impacts. However, some disruption and increased delays could still occur even with implementation of Project Mitigation Measure 16, and it is possible that significant construction-related transportation impacts on local and regional roadways could still occur. Localized construction-related transportation impacts would therefore remain *significant and unavoidable*.

7.1.8 Stadium

Project Mitigation Measure 17: Stadium 49ers Game Days Transportation Management Plan

The stadium operators shall develop and maintain a Transportation Management Plan (TMP) for the stadium. The stadium operator shall work with representatives from the SFMTA, the State Highway Patrol, the Police Department, private charter operators, Caltrain and others on a continuing basis to develop and refine the TMP, as determined appropriate by SFMTA. The final stadium TMP shall be approved by SFMTA. Preparation of the TMP shall be fully funded by the stadium operator, and shall be completed in time for implementation on opening day of the stadium.

The following actions shall be included in the TMP:

- Information on transportation options to the stadium, including game day service by the various regional service providers shall be distributed to season ticket holders, employees, and other patrons if possible.
- A brochure, information packet, and/or web page providing full information on transit access to the stadium, similar to that currently offered at the 49ers website, shall be updated and maintained.
- The use of charter buses to the stadium shall be encouraged and expanded. A number of measures shall be considered that could be implemented at low-cost to expand the use of group charters, including reduced parking costs, publicize the groups in 49ers publications and mailings, provide priority parking, provide lounges for bus drivers and provide support services for rooter clubs.
- Residential Permit Parking Program and/or additional parking restrictions, such as time limits, during game days, particularly in the Bayview Hunters Point areas, shall be explored with residents to reduce potential for intrusion of stadium vehicles into the adjacent neighborhood during a football game or secondary event.
- The stadium operator shall implement measures to encourage carpools of 4-plus persons per vehicle.
- The stadium operator shall charge a higher parking cost for low occupancy vehicles.
- The stadium operator shall develop a separate TDM plan for employees of the stadium and concessionaires. The plan shall consider measures such as providing employees and concessionaires with free or subsidized transit passes to encourage transit use and reduce vehicular travel to the stadium. Employees shall not receive preferential parking.
- The stadium operator shall develop measures with CPSRA to ensure that game day spectators do not park in CPSRA day use parking lots. Strategies to be explored include limiting parking in CPSRA lots to a limited duration during game days (e.g., to a two-hour period), or an increase in parking fees equivalent to game day parking, and ticketing and enforcement.
- The TMP shall ensure that regular transit routes operate acceptably near the stadium. The plan should consider providing alternate routes for those transit lines that do not have exclusive right of way on game days (48-Quintara-24th Street, 44-O'Shaughnessy, 29-Sunset) onto transit-only facilities such as the BRT right of way to the south and Palou Avenue to the north (which would be a transit-only facility on game days).

Implementing this mitigation measure would likely reduce automobile travel to the stadium and encourage transit usage. However, even with implementation of Project Mitigation Measure 17, the Project's impacts on Sunday pre-game and post-game period traffic conditions would remain *significant and unavoidable.*

Project Mitigation Measure 18: Stadium 49ers Game Days Transit Service

SFMTA shall increase frequency on regularly scheduled Muni routes serving the stadium area on game days. In addition, the stadium operator shall fund additional Muni shuttle service between the stadium and regional transit service, including BART (Balboa Park and/or Glen Park Station) and Caltrain (Bayshore Station). Although the specific frequencies of individual routes should be determined based on patron characteristics that may evolve over time, the increased transit service, taken as an aggregate, should generally compensate for the projected shortfall of 3,600 passengers per hour on the existing and proposed transit lines.

- Prior to opening day at the new stadium, the City and stadium operator shall determine costs associated with the increased service and determine funding sources. Examples of funding sources that shall be considered include a surcharge on game tickets or other such revenue mechanism. Implementation of increased transit service would be the responsibility of SFMTA and the stadium operator, and would be implemented when projected attendance warrants additional service.

With implementation of Project Mitigation Measure 18, the Project's impacts to transit service on Sundays during a football game could be reduced to less-than-significant levels. However, due to the traffic impacts during post-game conditions on transit operations, which could not be mitigated, the impact on transit operations would remain *significant and unavoidable.*

Project Mitigation Measure 19: Stadium Secondary Event Transportation Management Plan

The stadium operator shall develop as part of a stadium Transportation Management Plan (TMP), a strategy for coordinating with representatives of SFMTA and the SF Police Department for deploying traffic control officers in the Project vicinity to increase efficiency of pre- and post- event traffic, similar to what would be in place for football game days. The secondary event component of the stadium TMP shall be approved by SFMTA. The stadium operator shall fully fund implementation of the secondary event (i.e., non-49ers football events) measures.

Implementation of this mitigation measure would likely improve vehicle entrance and exit flows to the stadium site, maintain orderly traffic operations, and reduce intrusion onto neighborhood streets near the stadium. However, even with the implementation of Project Mitigation Measure 19 on days when special events are held at the stadium, the Project's impacts to the study roadway network would be *significant and unavoidable.*

Project Mitigation Measure 20: Stadium Secondary Event Transit Service

SFMTA shall increase frequency on regularly scheduled Muni routes serving the stadium area prior to large special events. In addition, the stadium operator shall fund additional Muni shuttle service between the stadium and regional transit service, including BART (Balboa Park and/or Glen Park stations) and Caltrain (Bayshore station).

- Routes 24-Divisadero, 28L-19th Avenue Limited, and 44-O'Shaughnessey would already be operating near their maximum frequency. Therefore, this mitigation measure primarily applies to the 48-Quintara-24th Street route and the new HPX service. If each of these routes were increased to have five-minute frequencies (typically considered the maximum frequency that can be regularly maintained), the transit capacity toward the stadium would increase by 828 passengers per hour, for a total of 3,928 passengers. Even with the additional service on these two lines, there would be a shortfall of 1,797 passengers per hour in transit capacity.
- Additional express service to key regional transit destinations and regional charter express service, similar to what is offered on football game days, would offset a portion of the shortfall in transit capacity. The amount and nature of special service to special stadium events would depend on the type and size of the special event. Generally, the capacity of the express service should compensate for the shortfall of 1,797 passengers per hour for a 37,500-person event (transit supply, would of course, be designed on a case-by-case basis depending on the expected size of the secondary event).
- SFMTA and the stadium operator shall implement a stadium transportation systems plan similar to that developed for game-day operations (except that the Yosemite Slough bridge shall not be available for private automobiles), on a case-by-case basis depending on the expected size of the secondary event.

Prior to opening day at the new stadium, the City and the stadium operator shall determine costs associated with the increased service and determine funding requirements. Examples of funding sources that shall be considered include a surcharge on game tickets, parking or admission surcharge, or other such revenue mechanism. Implementation of increased transit service would be the responsibility of SFMTA and the stadium operator, and would be implemented when projected attendance warrants additional service.

With implementation of Project Mitigation Measure 20, the Project's impacts to transit service on special event days would be reduced, but not to less-than-significant levels. In addition, traffic impacts during secondary events would not be mitigated, and would impact transit operations. Therefore, the impact on transit operations would remain *significant and unavoidable.*

7.1.9 Arena

Project Mitigation Measure 21: Arena Transportation Management Plan

The arena operator shall develop a Transportation Management Plan (TMP) for coordinating with representatives of SFMTA and the SF Police Department for deploying traffic control officers in the Project vicinity to increase efficiency of pre- and post- event traffic, and for developing incentives to increase transit ridership to the arena. Implementation of this mitigation measure would likely speed vehicle entrance and exit to the arena site as well as maintain orderly traffic operations and reduce intrusion onto minor routes to and from the arena. Traffic control officers would facilitate traffic flow at the intersection of Harney/Jamestown that would operate at LOS F conditions with a sell-out arena event. The final arena TMP shall be approved by SFMTA. Preparation of the TMP Plan shall be fully funded by the arena operator, and shall be completed in time for implementation on opening day of the arena.

However, even with the implementation of Project Mitigation Measure 21, the Project's impacts to the study roadway network during a sell-out event at the arena would be *significant and unavoidable*.

7.2 PROJECT VARIANT 1

7.2.1 Traffic

Project Variant 1 Mitigation Measure 1: Implement Project Mitigation Measure 1 – TDM Plan

Project Variant 1 Mitigation Measure 2: Implement Project Mitigation Measure 6 – Harney Way Widening

Project Variant 1 Mitigation Measure 3: Implement Project Mitigation Measure 2 – Improvements at Tunnel/Blanken

Project Variant 1 Mitigation Measure 4: Implement Project Mitigation Measure 3 – Harney Interchange Project Improvements

Project Variant 1 Mitigation Measure 5: At the intersection of Crisp/Palou/Griffith, restripe the southbound approach to provide a dedicated left-turn lane and a shared through/right-turn lane. On-street parking would be prohibited on Griffith Street between Palou Avenue and Oakdale Avenue. Implementation of this improvement would be the responsibility of SFMTA and DPW, and shall be implemented as part of Hunters Point Shipyard Phase 3 roadway network improvements. The Project Applicant, in collaboration with the City, shall monitor traffic conditions at completion of Phase 2, Phase 3 and Phase 4 to determine whether the intersection operations would warrant reconfiguration and when it should be implemented. Based on the monitoring, if the City determines reconfiguration is warranted, the Project Applicant shall be required to fund the cost of reconfiguration. The SFMTA and DPW shall design and implement the measure as necessary. With implementation of Project Variant 1 Mitigation Measure 5, this intersection would operate at acceptable LOS D or better in the AM and PM peak hours, and therefore with its implementation, project-related impacts at this intersection would be *less than significant*.

Project Variant 1 Mitigation Measure 6: Implement Project Mitigation Measure 4 – Improvements at Amador/Cargo/Illinois

Project Variant 1 Mitigation Measure 7: At the intersection of Innes/Earl, install a traffic signal. Installation of a traffic signal at the intersection of Innes/Earl would improve intersection operations to LOS D or better conditions. Traffic forecasts show that this intersection would be very close to meeting peak hour traffic signal warrants with buildout of the Project Variant 1. The Project Applicant, in collaboration with the City, shall monitor traffic volumes at completion of Phase 2, Phase 3 and Phase 4 to determine whether the intersection volumes would actually warrant a traffic signal and when it should be implemented. Based on the monitoring, if the City determines a traffic signal is warranted, the Project Applicant shall be required to fund installation of a traffic signal as part of later development phases. The SFMTA and DPW shall design and implement the measure as necessary. Implementation of Project Variant 1 Mitigation Measure 7 would reduce the impacts at this intersection to *less than significant* levels.

Project Variant 1 Mitigation Measure 8: Implement Project Mitigation Measure 5 – Improvements at Bayshore/Geneva

7.2.2 Transit

Project Variant 1 Mitigation Measure 9: Implement Project Mitigation Measure 7 – Project Transit Operating Plan

Project Variant 1 Mitigation Measure 10: Implement Project Mitigation Measure 8.1 and 8.2 – 9-San Bruno Improvements

Project Variant 1 Mitigation Measure 11: Implement Project Mitigation Measure 9.1 and 9.2 – 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy Improvements

Project Variant 1 Mitigation Measure 12: Implement Project Mitigation Measure 10.1 and 10.2 – 29-Sunset Improvements

Project Variant 1 Mitigation Measure 13: Implement Project Mitigation Measure 11.a and 11.2 – 48-Quintara-24th Street Improvements

Project Variant 1 Mitigation Measure 14: Implement Project Mitigation Measure 12 – 54-Felton Improvements

Project Variant 1 Mitigation Measure 15: Implement Project Mitigation Measure 13.1 and 13.2 – T-Third Improvements

Project Variant 1 Mitigation Measure 16: Implement Project Mitigation Measure 14.1 and 14.2 – 28L-19th Avenue/Geneva Limited Improvements

7.2.3 Bicycle

Project Variant 1 Mitigation Measure 17: Implement Project Mitigation Measure 15 – Bicycle Route #70 and #170 Improvements

7.2.4 Pedestrian

No significant environmental impacts have been identified; no mitigation required.

7.2.5 Parking

No significant environmental impacts have been identified; no mitigation required.

7.2.6 Loading

No significant environmental impacts have been identified; no mitigation required.

7.2.7 Construction

Project Variant 1 Mitigation Measure 18: Implement Project Mitigation Measure 16 – Construction Traffic Management Program

7.2.8 Stadium

No stadium proposed as part of Project Variant 1; no mitigation measures required.

7.2.9 Arena

Project Variant 1 Mitigation Measure 19: Implement Project Mitigation Measure 21 – Arena Transportation Management Program

Project Variant 1 Mitigation Measure 20: SFMTA shall increase frequency on regularly scheduled Muni routes serving the stadium area prior to large events at the arena. Routes 29-Sunset and 28L-19th Avenue Limited would already be operating near their maximum frequency. Therefore, this mitigation measure primarily applies to Route CPX. If headways on this route were increased to five-minute frequencies in the one to two-hours prior to an event at the arena, the hourly transit capacity toward the arena would increase by 380 passengers per hour, for a total of 2,658. This would likely be adequate capacity, but may still leave some routes over-capacity and others below-capacity. Therefore, additional shuttle service to key regional transit destinations, such as BART, Caltrain, and the T-Third light rail route shall also be provided by the arena operator.

7.3 PROJECT VARIANT 2

7.3.1 Traffic

Project Variant 2 Mitigation Measure 1: Implement Project Mitigation Measure 1 – TDM Plan

Project Variant 2 Mitigation Measure 2: Implement Project Mitigation Measure 6 – Harney Way Widening

Project Variant 2 Mitigation Measure 3: Implement Project Mitigation Measure 2 – Improvements at Tunnel/Blanken

Project Variant 2 Mitigation Measure 4: Implement Project Mitigation Measure 3 – Harney Interchange Project Improvements

Project Variant 2 Mitigation Measure 5: Implement Project Mitigation Measure 4 – Improvements at Amador/Cargo/Illinois

Project Variant 2 Mitigation Measure 6: Implement Project Mitigation Measure 5 – Improvements at Bayshore/Geneva

7.3.2 Transit

Project Variant 2 Mitigation Measure 7: Implement Project Mitigation Measure 7 – Project Transit Operating Plan

Project Variant 2 Mitigation Measure 8: Implement Project Mitigation Measure 8.1 and 8.2 – 9-San Bruno Improvements

Project Variant 2 Mitigation Measure 9: Implement Project Mitigation Measure 9.1 and 9.2 – 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy Improvements

Project Variant 2 Mitigation Measure 10: Implement Project Mitigation Measure 10.1 and 10.2 – 29-Sunset Improvements

Project Variant 2 Mitigation Measure 11: Implement Project Mitigation Measure 11.a and 11.2 – 48-Quintara-24th Street Improvements

Project Variant 2 Mitigation Measure 12: Implement Project Mitigation Measure 12 – 54-Felton Improvements

Project Variant 2 Mitigation Measure 13: Implement Project Mitigation Measure 13.1 and 13.2 – T-Third Improvements

Project Variant 2 Mitigation Measure 14: Implement Project Mitigation Measure 14.1 and 14.2 – 28L-19th Avenue/Geneva Limited Improvements

7.3.3 Bicycle

Project Variant 2 Mitigation Measure 15: Implement Project Mitigation Measure 15 – Bicycle Route #70 and #170 Improvements

7.3.4 Pedestrian

No significant environmental impacts have been identified; no mitigation required.

7.3.5 Parking

No significant environmental impacts have been identified; no mitigation required.

7.3.6 Loading

No significant environmental impacts have been identified; no mitigation required.

7.3.7 Construction

Project Variant 2 Mitigation Measure 16: Implement Project Mitigation Measure 16 – Construction Traffic Management Program

7.3.8 Stadium

No stadium proposed as part of Project Variant 1; no mitigation measures required.

7.3.9 Arena

Project Variant 2 Mitigation Measure 17: Implement Project Mitigation Measure 21 – Arena Transportation Management Program

Project Variant 2 Mitigation Measure 18: SFMTA shall increase frequency on regularly scheduled Muni routes serving the stadium area prior to large events at the arena. Routes 29-Sunset and 28L-19th Avenue Limited would already be operating near their maximum frequency. Therefore, this mitigation measure primarily applies to Route CPX. If headways on this route were increased to five-minute frequencies in the one to two-hours prior to an event at the arena, the hourly transit capacity toward the arena would increase by 380 passengers per hour, for a total of 2,658. This would likely be adequate capacity, but may still leave some routes over-capacity and others below-capacity. Therefore, additional shuttle service to key regional transit destinations, such as BART, Caltrain, and the T-Third light rail route shall also be provided by the arena operator.

7.4 ALTERNATIVE 1 (NO PROJECT)

No mitigation measures presented for No Project conditions. Development within Hunters Point Shipyard would be subject to the existing MMRP.

7.5 ALTERNATIVE 2 (NO BRIDGE)

7.5.1 Traffic

Alternative 2 Mitigation Measure 1: Implement Project Mitigation Measure 1 – TDM Plan

Alternative 2 Mitigation Measure 2: Implement Project Mitigation Measure 2 – Improvements at Tunnel/Blanken

Alternative 2 Mitigation Measure 3: Implement Project Mitigation Measure 3 – Harney Interchange Project Improvements

Alternative 2 Mitigation Measure 4: Implement Project Mitigation Measure 4 – Improvements at Amador/Cargo/Illinois

Alternative 2 Mitigation Measure 5: Implement Project Mitigation Measure 5 – Improvements at Bayshore/Geneva

Alternative 2 Mitigation Measure 6: Implement Project Mitigation Measure 6 – Harney Way Widening

7.5.2 Transit

Alternative 2 Mitigation Measure 7: Implement Project Mitigation Measure 7 – Project Transit Operating Plan

Alternative 2 Mitigation Measure 8: Implement Project Mitigation Measure 8.1 and 8.2 – 9-San Bruno Improvements

Alternative 2 Mitigation Measure 9: Implement Project Mitigation Measure 9.1 and 9.2 – 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy Improvements

Alternative 2 Mitigation Measure 10: Implement Project Mitigation Measure 10.1 and 10.2 – 29-Sunset Improvements

Alternative 2 Mitigation Measure 11: Implement Project Mitigation Measure 11.a and 11.2 – 48-Quintara-24th Street Improvements

Alternative 2 Mitigation Measure 12: Implement Project Mitigation Measure 12 – 54-Felton Improvements

Alternative 2 Mitigation Measure 13: Implement Project Mitigation Measure 13.1 and 13.2 – T-Third Improvements

Alternative 2 Mitigation Measure 14: Implement Project Mitigation Measure 14.1 and 14.2 – 28L-19th Avenue/Geneva Limited Improvements

7.5.3 Bicycle

Alternative 2 Mitigation Measure 15: Implement Project Mitigation Measure 15 – Bicycle Route #70 and #170 Improvements

7.5.4 Pedestrian

No significant environmental impacts have been identified; no mitigation required.

7.5.5 Parking

No significant environmental impacts have been identified; no mitigation required.

7.5.6 Loading

No significant environmental impacts have been identified; no mitigation required.

7.5.7 Construction

Alternative 2 Mitigation Measure 16: Implement Project Mitigation Measure 16 – Construction Traffic Management Program

7.5.8 Stadium

Alternative 2 Mitigation Measure 17: Implement Project Mitigation Measure 17 – Stadium 49ers Game Days Transportation Management Program

Alternative 2 Mitigation Measure 18: Implement Project Mitigation Measure 18 – Stadium 49ers Game Days Transit Service

Alternative 2 Mitigation Measure 19: Implement Project Mitigation Measure 19 – Stadium Secondary Event Transportation Management Program

Alternative 2 Mitigation Measure 20: Implement Project Mitigation Measure 20 – Stadium Secondary Event Transit Service

7.5.9 Arena

Alternative 2 Mitigation Measure 21: Implement Project Mitigation Measure 21 – Arena Transportation Management Program

7.6 ALTERNATIVE 3 (49ERS AT CANDLESTICK)

7.6.1 Traffic

Alternative 2 Mitigation Measure 1: Implement Project Mitigation Measure 1 – TDM Plan

Alternative 2 Mitigation Measure 2: Implement Project Mitigation Measure 3 – Harney Interchange Project Improvements

Alternative 2 Mitigation Measure 3: Implement Project Mitigation Measure 4 – Improvements at Amador/Cargo/Illinois

Alternative 2 Mitigation Measure 4: Implement Project Mitigation Measure 5 – Improvements at Bayshore/Geneva

Alternative 3 Mitigation Measure 5: At the intersection of Harney/Jamestown, install a traffic signal at the intersection of Harney/Jamestown. Implementation of this measure would be the responsibility of SFMTA, and should be implemented when traffic signal warrants are met. Prior to completion of Phase 1 of development, the Project Applicant shall fully fund the cost of signalization improvements. Implementation of this mitigation measure would reduce Alternative 3 traffic impacts at this intersection to *less than significant* levels.

Alternative 3 Mitigation Measure 6: At the intersection of Ingalls/Thomas, install traffic signal at the intersection of Ingalls/Thomas. Implementation of this measure would be the responsibility of SFMTA, and should be implemented when traffic signal warrants are met. Prior to completion of Phase 1 of development, the Project Applicant shall fully fund the cost of signalization improvements. Installation of a traffic signal at the intersection of Ingalls/Thomas intersection would improve intersection operations to LOS D or better conditions. Implementation of Alternative 3 Mitigation Measure 6 would reduce the impacts at this intersection to *less than significant* levels.

Alternative 3 Mitigation Measure 7: At the intersection of Arelious Walker/Gilman, install a traffic signal at the intersection of Arelious Walker/Gilman. Implementation of the new signal would be the responsibility of SFMTA, and should be implemented when traffic signal warrants are met. Since signalization was determined to be required even without the Project under 2030 No Project conditions, the Project Applicant shall contribute its fair-share toward the cost of improvements. Prior to payment of the contribution, the City shall create a mechanism to determine and receive fair share contributions from the Project Applicant. The SFMTA and DPW shall design and implement the measure as necessary. Since implementation of this mitigation measure is uncertain, traffic impacts would remain significant and unavoidable.

7.6.2 Transit

Alternative 3 Mitigation Measure 8: Implement Project Mitigation Measure 7 – Project Transit Operating Plan

Alternative 3 Mitigation Measure 9: Implement Project Mitigation Measure 8.1 and 8.2 – 9-San Bruno Improvements

Alternative 3 Mitigation Measure 10: Implement Project Mitigation Measure 9.1 and 9.2 – 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy Improvements

Alternative 3 Mitigation Measure 11: Implement Project Mitigation Measure 10.1 and 10.2 – 29-Sunset Improvements

Alternative 3 Mitigation Measure 12: Implement Project Mitigation Measure 11.a and 11.2 – 48-Quintara-24th Street Improvements

Alternative 3 Mitigation Measure 13: Implement Project Mitigation Measure 12 – 54-Felton Improvements

Alternative 3 Mitigation Measure 14: Implement Project Mitigation Measure 13.1 and 13.2 – T-Third Improvements

Alternative 3 Mitigation Measure 15: Implement Project Mitigation Measure 14.1 and 14.2 – 28L-19th Avenue/Geneva Limited Improvements

7.6.3 Bicycle

Alternative 3 Mitigation Measure 16: Implement Project Mitigation Measure 15 – Bicycle Route #70 and #170 Improvements

7.6.4 Pedestrian

No significant environmental impacts have been identified; no mitigation required.

7.6.5 Parking

No significant environmental impacts have been identified; no mitigation required.

7.6.6 Loading

No significant environmental impacts have been identified; no mitigation required.

7.6.7 Construction

Alternative 3 Mitigation Measure 17: Implement Project Mitigation Measure 16 – Construction Traffic Management Program

7.6.8 Stadium

49ers would remain at existing stadium. No stadium proposed as part of Alternative 3; no mitigation measures required.

7.6.9 Arena

No arena proposed as part of Alternative 3; no mitigation measures required.

7.7 ALTERNATIVE 4 (LESSER BUILD)

7.7.1 Traffic

Alternative 4 Mitigation Measure 1: Implement Project Mitigation Measure 1 – TDM Plan

Alternative 4 Mitigation Measure 2: Implement Project Mitigation Measure 6 – Harney Way Widening

Alternative 4 Mitigation Measure 3: Implement Project Mitigation Measure 2 – Improvements at Tunnel/Blanken

Alternative 4 Mitigation Measure 4: Implement Project Mitigation Measure 3 – Harney Interchange Project Improvements

Alternative 4 Mitigation Measure 5: Implement Project Mitigation Measure 5 – Improvements at Bayshore/Geneva

7.7.2 Transit

Alternative 4 Mitigation Measure 6: Implement Project Mitigation Measure 7 – Project Transit Operating Plan

Alternative 4 Mitigation Measure 7: Implement Project Mitigation Measure 8.1 and 8.2 – 9-San Bruno Improvements

Alternative 4 Mitigation Measure 8: Implement Project Mitigation Measure 9.1 and 9.2 – 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy Improvements

Alternative 4 Mitigation Measure 9: Implement Project Mitigation Measure 10.1 and 10.2 – 29-Sunset Improvements

Alternative 4 Mitigation Measure 10: Implement Project Mitigation Measure 11.a and 11.2 – 48-Quintara-24th Street Improvements

Alternative 4 Mitigation Measure 11: Implement Project Mitigation Measure 12 – 54-Felton Improvements

Alternative 4 Mitigation Measure 12: Implement Project Mitigation Measure 13.1 and 13.2 – T-Third Improvements

Alternative 4 Mitigation Measure 13: Implement Project Mitigation Measure 14.1 and 14.2 – 28L-19th Avenue/Geneva Limited Improvements

7.7.3 Bicycle

Alternative 4 Mitigation Measure 14: Implement Project Mitigation Measure 15 – Bicycle Route #70 and #170 Improvements

7.7.4 Pedestrian

No significant environmental impacts have been identified; no mitigation required.

7.7.5 Parking

No significant environmental impacts have been identified; no mitigation required.

7.7.6 Loading

No significant environmental impacts have been identified; no mitigation required.

7.7.7 Construction

Alternative 4 Mitigation Measure 15: Implement Project Mitigation Measure 16 – Construction Traffic Management Program

7.7.8 Stadium

No stadium proposed; no mitigation measures required.

7.7.9 Arena

Alternative 4 Mitigation Measure 16: Implement Project Mitigation Measure 21 – Arena Transportation Management Program

7.8 ALTERNATIVE 5 (NO PARK AGREEMENT)

7.8.1 Traffic

Alternative 5 Mitigation Measure 1: Implement Project Mitigation Measure 1 – TDM Plan

Alternative 5 Mitigation Measure 2: Implement Project Mitigation Measure 2 – Improvements at Tunnel/Blanken

Alternative 5 Mitigation Measure 3: Implement Project Mitigation Measure 3 – Harney Interchange Project Improvements

Alternative 5 Mitigation Measure 4: Implement Project Mitigation Measure 4 – Improvements at Amador/Cargo/Illinois

Alternative 5 Mitigation Measure 5: Implement Project Mitigation Measure 5 – Improvements at Bayshore/Geneva

Alternative 5 Mitigation Measure 6: Implement Project Mitigation Measure 6 – Harney Way Widening

7.8.2 Transit

Alternative 5 Mitigation Measure 7: Implement Project Mitigation Measure 7 – Project Transit Operating Plan

Alternative 5 Mitigation Measure 8: Implement Project Mitigation Measure 8.1 and 8.2 – 9-San Bruno Improvements

Alternative 5 Mitigation Measure 9: Implement Project Mitigation Measure 9.1 and 9.2 – 23-Monterey, 24-Divisadero, and 44-O'Shaughnessy Improvements

Alternative 5 Mitigation Measure 10: Implement Project Mitigation Measure 10.1 and 10.2 – 29-Sunset Improvements

Alternative 5 Mitigation Measure 11: Implement Project Mitigation Measure 11.a and 11.2 – 48-Quintara-24th Street Improvements

Alternative 5 Mitigation Measure 12: Implement Project Mitigation Measure 12 – 54-Felton Improvements

Alternative 5 Mitigation Measure 13: Implement Project Mitigation Measure 13.1 and 13.2 – T-Third Improvements

Alternative 5 Mitigation Measure 14: Implement Project Mitigation Measure 14.1 and 14.2 – 28L-19th Avenue/Geneva Limited Improvements

7.8.3 Bicycle

Alternative 5 Mitigation Measure 15: Implement Project Mitigation Measure 15 – Bicycle Route #70 and #170 Improvements

7.8.4 Pedestrian

No significant environmental impacts have been identified; no mitigation required.

7.8.5 Parking

No significant environmental impacts have been identified; no mitigation required.

7.8.6 Loading

No significant environmental impacts have been identified; no mitigation required.

7.8.7 Construction

Alternative 5 Mitigation Measure 16: Implement Project Mitigation Measure 16 – Construction Traffic Management Program

7.8.8 Stadium

No stadium proposed; no mitigation measures required.

7.8.9 Arena

Alternative 5 Mitigation Measure 17: Implement Project Mitigation Measure 21 – Arena Transportation Management Program