Chapter 4

Environmental Consequences

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4 Environmental Consequences

This chapter describes the potential environmental consequences to resources associated with the DoN's disposal and the city's reuse of HPS. Each resource area is addressed in its own section, numbered as follows:

- 4.1 Transportation, Traffic, and Circulation
- 4.2 Air Quality and Green House Gases (GHG)
- 4.3 Noise
- 4.4 Land Use and Recreation
- 4.5 Visual Resources and Aesthetics
- 4.6 Socioeconomics
- 4.7 Hazards and Hazardous Substances
- 4.8 Geology and Soils
- 4.9 Water Resources
- 4.10 Utilities
- 4.11 Public Services
- 4.12 Cultural Resources
- 4.13 Biological Resources

Each of the reuse alternatives is analyzed relative to these 13 environmental resource areas. DoN disposal of HPS is assumed as part of each reuse alternative. Each discussion is organized as follows:

- Methodology: This subsection describes significance factors used to evaluate the degree of significance for each potential impact. It also describes the analytic method(s) used to evaluate project impacts against their significance factors.
- Alternative 1 (Stadium Plan Alternative): This subsection addresses the environmental consequences of the city's development plan provided in the *Candlestick Point – Hunters Point Shipyard Phase II Development Plan Environmental Impact Report* (EIR) (SFRA 2010). Alternative 1 would involve a wide range of uses, including a mixed-use community with residential, retail, office, research and development (R&D), and civic and community uses, as well as parks and recreational open space. A major component of this plan would include a new stadium. It would also include a 300-slip marina, improvements to stabilize the shoreline, and a new bridge over Yosemite Slough. New infrastructure would serve the development as necessary.
- Alternative 1A (Stadium Plan/No-Bridge Alternative): This subsection addresses the environmental consequences of a reuse alternative that would be based on the same land use plan proposed for Alternative 1, with the exception that the Yosemite Slough bridge would not be constructed, and game-day traffic would be routed around the slough.
- Alternative 2 (Non-Stadium Plan/Additional R&D Alternative): This subsection analyzes the environmental consequences of a reuse alternative that would be based on a land use plan characterized by no football stadium but additional R&D-oriented uses. Instead of the stadium, an additional three million ft^2 (278,709 m^2) of R&D space would be developed on the stadium site in addition to the other components noted under Alternative 1 for residential, retail, R&D, parks and recreation, and civic and community use space. This alternative would also reconfigure the design and sizes of the parks and open space areas, resulting in a reduction of 9.4 ac (3.8 ha) compared to Alternative 1. Further, the development of this alternative would be based on a land use plan that provided for the same development scenario, except that it would preserve four structures located within the R&D district (Buildings 211, 224, 231, and 253) that are proposed for demolition under Alternative 1.
- Alternative 2A (Non-Stadium Plan/Housing and R&D Alternative): This subsection analyzes the environmental consequences of a reuse alternative that would be based on a land use plan characterized by no stadium but additional residential and R&D uses. Instead of the football

stadium, an additional 1,625 residential units and 500,000 ft^2 (46,452 m^2) of R&D space would be developed. This alternative would also reconfigure the design and sizes of the parks and open space, resulting in a decrease of 9.8 ac (4.0 ha) compared to Alternative 1. Further, the development of this alternative would be based on a land use plan that provided for the same development scenario except that it would preserve four structures located within the R&D district (Buildings 211, 224, 231, and 253) that are proposed for demolition under Alternative 1.

- Alternative 3 (Non-Stadium Plan/Additional Housing Alternative): This subsection analyzes the environmental consequences of a reuse alternative that would be based on a land use plan characterized by no stadium but additional residential uses. Instead of the football stadium, an additional 1,350 residential units would be developed on the proposed stadium site, and the neighborhood retail land uses would be relocated to the stadium site to serve residential uses. This alternative would also reconfigure the design and sizes of the parks and open space areas, resulting in an increase of 13 ac (5.3 ha) compared to Alternative 1. Further, the development of this alternative could be based on a land use plan that provided for the same development scenario except that it would preserve four structures located within the R&D district (Buildings 211, 224, 231, and 253) that are proposed for demolition under Alternative 1.
- Alternative 4 (Non-Stadium Plan/Reduced Development Alternative): This subsection analyzes the environmental consequences of a reuse alternative that would be based on a land use plan characterized by no stadium and a reduction in the area subject to development of about 30 percent, compared to Alternative 1. It would also preserve several existing structures located within the R&D district (Buildings 211, 224, 231, and 253) that would be proposed for demolition under Alternative 1. Under Alternative 4, the football stadium, marina, shoreline improvements, and Yosemite Slough bridge would not be constructed.
- No Action Alternative: This subsection addresses the environmental consequences of not disposing of, reusing, or redeveloping HPS under Proposition G or the existing HPS Redevelopment Plan. Under this alternative, the property would remain a closed federal property under caretaker status. Environmental cleanup would continue until completion. No new leases would be executed under the No Action Alternative. Existing leases would continue until they expire or are terminated, after which the DoN could decide to renew or extend some or all of the leases. Environmental impacts associated with the renewal or extension of existing leases would be evaluated before making such decisions.

The impact analysis in this chapter compares projected future conditions to the affected environment described in Chapter 3. For each resource area, the factors that were considered in assessing the potential significance of the impact on construction or operation reuse phases are identified, and the methodology and general assumptions used in the impact analysis are presented. Individual factors are included in a construction or operation section only where they apply. For each identified impact, the relevant factor is listed in parentheses following the title of the impact. Each identified impact is characterized according to its significance. Impacts are either significant (with corresponding mitigation, as feasible), not significant, or significant and unavoidable where mitigation is not feasible or would not eliminate or reduce the impact to not significant. Although the focus of this analysis is on identifying potential adverse impacts, some beneficial effects also are identified by the analysis.

Under NEPA, the federal agency proposing an action must evaluate the environmental effects (impacts) that can reasonably be anticipated to be caused by or result from the proposed action and alternatives. In as much as the proposed action will be required to comply with federal, state, interstate, and local laws and regulations, the environmental impacts that the DoN has evaluated are those impacts which can reasonably be expected to result from the lawful implementation of the proposed action. In identifying direct impacts and reasonably foreseeable indirect impacts, the DoN has taken into account all applicable measures and restrictions protective of human health and the environment that are required by existing laws and regulations. In many instances, the existence of such laws and regulations renders impacts that might have occurred in the absence of such laws highly unlikely and not reasonably foreseeable. In other instances, such laws and regulations work to lessen potential impacts to levels that are not significant. Because compliance with applicable laws is mandatory for the action proponent, compliance with the requirements of such laws and regulations is generally not identified separately as mitigation.

Measures or controls that can be taken to reduce impacts to a level that is not significant are suggested for each alternative, as appropriate. Reuse of HPS would be in a manner consistent with the *HPS Redevelopment Plan* amended 3 August 2010. The disposal of the property is the responsibility of the DoN, and the City and County of San Francisco, as successor to the SFRA, is responsible for the implementation of the *HPS Redevelopment Plan*. Mitigation measures and project environmental controls identified for impacts associated with reuse would be the responsibility of the future developer or owner of the property, under the direction of the City and County of San Francisco and federal, state, and local agencies with regulatory authority over and responsibility for such resources, and would be subject to permitting and monitoring requirements. The DoN, USEPA, and State of California regulatory agencies will, independent of the proposed action and this SEIS, require that before any project site development activity occurs at HPS, appropriate and legally enforceable CERCLA Institutional Controls (ICs) in the form of a recorded covenant, deed provision, easement, or lease term are in effect and applicable in order to ensure adequate protection of human health and the environment.

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4.1 Transportation, Traffic, and Circulation

This section analyzes the potential project-level and cumulative impacts on transportation, traffic, and circulation resulting from the project alternatives. Transportation-related issues of concern that are addressed include traffic on local and regional roadways, transit, bicycles, pedestrians, freight loading, and construction-related activities. Transportation impacts are assessed for weekday A.M. and P.M. commute periods, and also for Sunday non-game day conditions. This section is based on information contained in the following documents:

- *Hunters Point Shipyard Reuse Final EIS/EIR*, SFRA and City and County of San Francisco Planning Department (File No. 1994.061E), dated 8 February 2000;
- *Candlestick Point-Hunters Point Shipyard Phase II Development Plan Transportation Study*, prepared by CHS Consulting, Fehr & Peers, and LCW Consulting, dated 9 November 2009;
- *Candlestick Point-Hunters Point Shipyard Phase II Development Plan Draft EIR*, SFRA (File No. ER06.05.07) and City and County of San Francisco Planning Department (File No. 2007.0946E), dated 12 November 2009; and
- *Candlestick Point-Hunters Point Shipyard Phase II Development Plan Project, Comments & Responses, Volume X: Comments & Responses (Appendices)*, SFRA (File No. ER06.05.07), City and County of San Francisco Planning Department (File No. 2007.0946E), and State Clearinghouse (No. 2007082168), dated 13 May 2010.

4.1.1 Methodology

The region of influence (ROI) for the transportation, traffic, and circulation analysis includes regional and local access routes and the street system of HPS. The project vicinity also encompasses public transit modes: rail, light rail, and bus services that would potentially serve HPS; bicycle routes to and through the project vicinity; and crosswalks in the project vicinity serving large numbers of pedestrians. Appendix L, Transportation, Traffic, and Circulation Resource Data, contains supporting details of the analyses prepared for the impact assessments herein. The appendix contains tables documenting level of service calculations, model projections of future traffic, basic freeway worksheets, capacity analyses, trip distribution assignments, construction trip generation, and transit ridership and capacity utilization analyses.

4.1.1.1 Significance Factors

Significance factors against which impacts are assessed are derived from a number of sources including city policies and guidelines, state (Caltrans) standards, and other commonly applied measures that define acceptable levels of service.

Factors considered in determining whether an alternative would have significant impacts on transportation include the extent or degree to which the implementation of an alternative would affect conditions during construction or operations as discussed in the following sections.

4.1.1.1.1 Construction

Factor 1 Construction impacts of the project would be significant if they would result in street or lane closures in the project vicinity due to construction vehicle traffic and roadway construction, delays in the flow of traffic, or would contribute to cumulative construction impacts in the project vicinity;

4.1.1.1.2 Operations

Factor 2 **Intersections**. The project would have a significant adverse impact on traffic if the LOS at a signalized intersection would deteriorate from LOS D or better to LOS E or LOS F, or from LOS E to LOS F. In addition, the project would have a significant impact 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). A considerable contribution is defined as a project contribution of 5 percent or more to traffic volumes at an adversely affected intersection. Contributions of less than 5 percent are not considered significant project impacts, although the impact would be considered cumulatively significant. The operational impacts on unsignalized intersections are considered potentially significant if project-related traffic causes the LOS at the worst approach to deteriorate from LOS D or better to LOS E or LOS F and California MUTCD signal warrants would be met, or causes signal warrants to be met when the worst approach is already at LOS E or LOS F;

Freeway and Ramps. Operational impacts on freeway mainline segments and freeway on- and off-ramps would be significant if project-related traffic causes the level of service to deteriorate from LOS D or better to LOS E or LOS F, or from LOS E to LOS F; in addition, the project would have a significant impact if it would contribute substantially (by 5 percent or more) to congestion at unacceptable levels;

Factor 3 The project would have a significant impact 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;

Factor 4 The project would have a significant impact if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the project site and vicinity;

Factor 5 The project would have a significant impact if it would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the project site and vicinity;

Factor 6 Operation of the project would have a significant impact if it would result in inadequate emergency vehicle access; and/or

Factor 7 Operation of the project would have a significant impact if it would result in a loading demand during the peak hour of loading activities that could not be accommodated within the proposed onsite 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.

4.1.1.2 Analytic Method

This section presents the methodology for developing future baseline conditions, cumulative conditions, and travel demand estimates, in the following order:

1) Analysis approach;
2) 2030 baseline condition;
3) 2030 cumulative condition; and
4) Project travel demand.

4.1.1.2.1 Analysis Approach

The analysis of the proposed action was conducted for 2030 conditions. Year 2030 was selected as the future analysis year because the basis for the future year forecasts, the San Francisco County Transportation Authority (SFCTA) travel demand model (SF-CHAMP), develops traffic and transit forecasts for cumulative development and growth through 2030. The analysis includes 2030 baseline and cumulative conditions.

The baseline condition for the analysis here is the transportation system as of 2007-2009 projected forward to the year 2030. The 2030 baseline condition, described in Section 4.1.1.2.2., represents future project site traffic conditions without the implementation of the proposed action (i.e., HPS disposal and redevelopment), the proposed development at Candlestick Point, and the recommended transportation improvements for both projects. The baseline condition includes other reasonably foreseeable non-project development and transportation infrastructure improvements that are projected to be implemented by 2030. The baseline condition is used to compare and identify potential impacts likely to result from implementation of the proposed action by comparing the projected 2030 conditions with the project (or a project alternative) to the projected 2030 (baseline) conditions without the project. Any incremental increased demand on the transportation above the 2030 baseline represents impacts of the project or alternative.

The 2030 cumulative condition, described in Section 4.1.1.2.3, represents a cumulative growth approach and includes the non-project actions identified in the 2030 baseline condition in addition to the full build-out of the proposed action (i.e., HPS disposal and redevelopment) and development at Candlestick Point, as well as the transportation infrastructure improvements associated with these two projects. It is noted that the transportation infrastructure improvements associated with proposed action would be the responsibility of the future developers of HPS and/or the City and County of San Francisco. DoN would have no role or responsibility in the funding, planning, design, or construction of any offsite transportation improvements or onsite transportation improvements following disposal of the HPS property.

The impact analysis includes an assessment of potential impacts resulting from six reuse alternatives and a No Action Alternative (as presented in Table 4.1.1-1). Impacts are based on the significance criteria presented in Section 4.1.1.1. This impact analysis assesses whether the number of vehicle and transit trips generated by the proposed action would be significant, not including the Candlestick Point Project. The impact analysis assesses potential LOS impacts on traffic at key intersections, freeway ramps, and mainline segments within HPS and in the project vicinity, as well as potential impacts to transit pedestrian and bicycle use, parking, and truck loading (see Appendix L, Transportation, Traffic, and Circulation Resource Data). These analyses were performed using the methodologies updated for the most current High Capacity Manual for traffic analysis and by the San Francisco Planning Department.

The approach utilized in this SEIS is consistent with that used in the Hunters Point Shipyard 2000 FEIS, except that there is no analysis of the partial build-out scenario. Partial build-out was not analyzed in this SEIS because the portion identified as partial build in the 2000 FEIS has already been disposed of and is not part of this proposed action. Traffic conditions resulting from this development are included in the 2030 baseline condition.

An evaluation of transportation impacts was also performed in comparison to the project site using the 1993 baseline evaluated in the 2000 FEIS. Appendix M of this SEIS contains that analysis. In comparison to the baseline used here, the 1993 baseline traffic was somewhat higher than the 2007 baseline since traffic levels in 1993 marginally exceeded those in 2007. Using traffic levels measured in 2007 as is done here establishes a conservative basis for assessing transportation impacts compared to a

1993 baseline. Therefore, while the impacts evaluated based on a 1993 baseline would be marginally lower than those described herein, they are broadly consistent with each other.

The other key differences in the traffic and transit impact analysis methods used in this SEIS compared to the 2000 FEIS are related to the change of guidance and methodologies that have occurred since the publication of the original 2000 FEIS. These differences include:

1) Traffic impact analysis: The method used to assess traffic impacts in the 2000 FEIS was based on the 1994 Highway Capacity Manual (HCM) methodologies (account for intersection stop delay only); the methodologies used to assess traffic impacts in this SEIS are based on the 2000 HCM (account for both stop delay and control delays, such as deceleration and acceleration delays and queuing delays); and
2) Transit impact analysis: The San Francisco Planning Department recently developed a more refined approach to assess transit impacts. In addition to assessing capacity utilization, a transit delay analysis is also required. Transit delays could potentially affect the number of transit vehicles required to provide an acceptable level of service.

4.1.1.2.2 2030 Baseline Conditions

This section presents non-project assumptions used to develop 2030 baseline traffic volumes. As indicated in Section 4.1.1.2.1, future year traffic volumes were developed using the SF-CHAMP model. The model includes the city's assumptions for changes in future 2030 baseline transportation network improvements and land uses. The 2030 baseline condition represents future project area traffic conditions without the implementation of the proposed action (i.e., HPS disposal and redevelopment), the proposed development at Candlestick Point, and the recommended transportation improvements for both projects.

Future 2030 Baseline Transportation Network Improvements

The 2030 SF-CHAMP model baseline analysis assumes completion of certain non-project actions, as described below, to the existing roadway systems and traffic signals, transit services, and bicycle facilities without the proposed action. The San Francisco Planning Department has made a determination, as part of the Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR, that these projects would be implemented in the reasonable foreseeable future and that these projects should be included in the future 2030 baseline network improvements.

ROADWAY IMPROVEMENTS

These changes are required mitigation measures for the Bayview Hunters Point Area Redevelopment Plan, the Visitation Valley Redevelopment Plan, and Executive Park development projects. They include changes at seven intersections along Bayshore Blvd and one at Tunnel St and Blanken St. They also include improvements along Harney Way as required for the Executive Park development project. In addition to the intersection related improvements, the 2030 baseline condition also assumes that the following two regional roadway improvements would be implemented. These two roadway projects have been identified as key elements by the By-County Transportation Improvement Project in the project vicinity that could potentially improve access to and from HPS.

- **Geneva Ave/Harney Way Extension**: Geneva Ave, which currently ends at Bayshore Blvd, would be extended east to meet Harney Way. The extension would have three eastbound and three westbound travel lanes between Bayshore Blvd and a new interchange with US-101. Currently, the nearest east/west access road is Blanken Ave, which could not accommodate the additional east/west traffic generated by area projects. The lead agency for this project is the City of Brisbane.

- **New US-101 Interchange at Geneva Ave/Harney Way**: In conjunction with the extension of Geneva Ave 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. Two alternatives are currently being assessed: one with Geneva Ave/Harney Way crossing under US-101, and one with Geneva Ave/Harney Way crossing over US-101. For both alternatives, a new bypass to the existing northbound Third St off-ramp would be constructed. The Geneva Ave/Harney Way crossing of US-101 would have six lanes eastbound (three left-turn lanes and three through lanes) and six lanes westbound (three left-turn lanes and three through lanes), for a total of 12 lanes. The northbound and southbound ramp intersections with Geneva Ave/Harney Way would be signalized.

TRANSIT IMPROVEMENTS

San Francisco Municipal Transportation Agency (SFMTA) has proposed changes to several of the lines that would serve the study area as part of its Transit Effectiveness Project (TEP) (SFMTA 2009b). 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. The proposed future transit changes could include:

- Eliminating 19-Polk (bus) service to HPS;
- Extending the 48-Quintara-24th St (bus) from its current terminus at 25th St and Connecticut St in Potrero Hill into HPS in order to offset the elimination of the 19-Polk (bus) service to HPS. Frequencies on the 48-Quintara-24th St (bus) would be reduced from 12 minutes to 15 minutes in the A.M. and P.M. peak hours;
- Increasing frequency on the 24-Divisadero (trolley bus) from 8.5 minutes in the A.M. peak hour and 10 minutes in the P.M. peak hour to 7.5 minutes in the A.M. and P.M. peak hours;
- Increasing frequency on the 44-O'Shaughnessey (bus) to 6 minutes in the P.M. peak hour;
- Increasing frequency on the 54-Felton (bus) from 30 minutes to 20 minutes in the A.M. and P.M. peak hours;
- Extending the 28L-19th Ave Limited (bus) from its current terminus at the Daly City BART station up to Geneva Ave, terminating just east of Mission St. The 28L-19th Ave Limited (bus) would maintain its current 10-minute frequency in the A.M. and P.M. peak hours; and
- Extending/rerouting the T-Third light rail line north of the station at Fourth and King Streets. Currently, the T-Third St continues north along The Embarcadero, entering the Market St subway just north of Folsom St. As part of the Central Subway project, beginning in approximately 2016, the T-Third St line will continue north on Fourth St, entering a new subway under Fourth St just south of Harrison St. The new terminus will be in Chinatown, below Stockton St. 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 St operating at 7.5-minute frequencies.

BICYCLE IMPROVEMENTS

The *San Francisco Bicycle Plan*, adopted in June 2009, 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 (SFMTA 2009a). It also includes long-term improvements and minor improvements that would be implemented to facilitate bicycling in San Francisco. The *San Francisco Bicycle Plan* includes the following short-term projects within the study area:

- *San Francisco Bicycle Plan* Project 4-2: Cargo Way Bicycle Lanes. Installation of Class II bicycle lanes in both directions on Cargo Way between Third St and Jennings St;
- *San Francisco Bicycle Plan* Project 4-3: Illinois St Bicycle Lanes. Installation of Class II bicycle lanes in both directions on Bicycle Route #5 on Illinois St between 16th St and Cargo Way;
- *San Francisco Bicycle Plan* Project 4-4: Innes Ave Bicycle Lanes. Installation of Class II or Class III bicycle facilities in both directions on Bicycle Route #68 on Innes Ave between Donahue St and Hunters Point Blvd. Two options have been identified for this segment (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 Ave between Hunters Point Blvd and Earl St and on both sides of Innes Ave between Earl St and Donahue St. Option 2 would be similar to Option 1 except for the segment from Hunters Point Blvd to Earl St where sharrows (i.e., shared bike and vehicle lanes indicated by on-pavement symbol markings) would be added to the existing Class III bicycle route in both directions; and
- *San Francisco Bicycle Plan* Project 5-5: Cesar Chavez Bicycle Lanes. Installation of Class II bicycle lanes in both directions on Bicycle Route #25 on Cesar Chavez St between Kansas St (near US-101) and Mississippi St (near I-280).

The *San Francisco Bicycle Plan* includes five long-term improvements within the study area. With the exception of the Bay Trail improvements which involve construction of a Class I off-street path, and Mendell St 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 long-term improvements could 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; and
- Long-Term Improvement L-15: Mendell St between Oakdale Ave and Palou Ave.

Future 2030 Baseline Land Use Assumptions

The 2030 baseline land use assumptions were obtained from Association of Bay Area Governments (ABAG) Projections 2007 (ABAG 2006), which was the basis for the SF-CHAMP model 2030 baseline travel demand forecast. ABAG Projections 2007 provides employment and population forecasts for San Francisco. The San Francisco Planning Department was responsible for allocating ABAG's countywide growth forecast to each traffic analysis zone in the SF-CHAMP model, based upon existing zoning and approved plans. The estimated changes in population and employment in the project vicinity includes the following major redevelopment and development plans:

- Bayview Hunters Point Redevelopment Plan: 1,800 residential units and 2.8 million gft^2 (260,000 gm^2) of retail and commercial use;
- Visitation Valley Redevelopment Plan: 1,600 residential units and 196,000 gft^2 (18,200 gm^2) of retail and community services use;

- India Basin Redevelopment Project: 1,240 housing units and 1.465 million gft^2 (136,000 gm^2) of neighborhood retail and office;
- Hunters View Project: 800 housing units and 28,000 gft^2 (2,600 gm^2) of neighborhood retail and community services;
- Executive Park project: conversion of existing office use to 3,400 units and 88,500 gft^2 (8,200 gm^2) of neighborhood retail); and
- Brisbane Baylands project: 8 million gft^2 (743,000 gm^2) of mixed-use development.

2030 Baseline Traffic Volume Forecasts

There are two major elements influencing the 2030 baseline traffic volume forecasts: one is changes in population and employment and the second is changes in the transportation network in San Francisco and the Bay Area.

The 2030 baseline conditions were developed via a two-step process which utilized: 1) the SFCTA travel demand model (SF-CHAMP) to determine background transit ridership and 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. Proposed nearby developments are shown on Figure 4.1.1-1. The methodology is the basis for 2030 baseline conditions:

1) *SF-CHAMP Model Growth Projections*:[1] 2030 baseline traffic volumes were estimated based on the increase in population and employment from ABAG Projections 2007 as described above; and
2) *Local Development Traffic and Transit Overlays*: In the project vicinity, several development proposals have recently been approved or are in environmental review. While these projects had been included as part of the growth projections in the SF-CHAMP model, to account for the localized effects of traffic and transit demand, the trip generation associated with those projects was extracted from the SF-CHAMP model output, and travel demand estimates used in the environmental review of these projects were then manually added to the SF-CHAMP model 2030 baseline traffic volume estimates developed in the previous step. The projects include India Basin, Visitacion Valley, Hunters View, Executive Park, and Brisbane Baylands. The 2030 baseline condition was developed based on the above methodology, which includes the approved residential development currently under-construction within the former HPS boundaries (known as Phase I).

Since the SF-CHAMP model is a weekday travel demand model, future year Sunday P.M. peak hour conditions were estimated based on the growth rates developed for the weekday P.M. condition. This is a conservative approach because land uses for the proposed action (the great majority of the building square footages would be for residential and R&D uses) would generate higher traffic demand during weekday P.M. peak hours than the weekend midday period.

[1] The SF-CHAMP model is an activity-based travel demand model that has been validated to existing conditions and can be used to forecast future transportation conditions in San Francisco, and is updated regularly. The SF-CHAMP model predicts person-travel based on assumptions of growth in population, housing units, and employment by mode for auto, transit, walk, and bicycle trips. The 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 congested travel speeds. The model travel demand estimates incorporate the Association of Bay Area Governments (ABAG) land use and socio-economic database and growth forecasts for 2030 (ABAG 2006), which provide forecasts of economic and population growth for San Francisco and 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 Traffic Analysis Zone (TAZ) based upon existing zoning and approved plans, using an area's potential zoning capacity and the anticipated extent of redevelopment of existing uses.

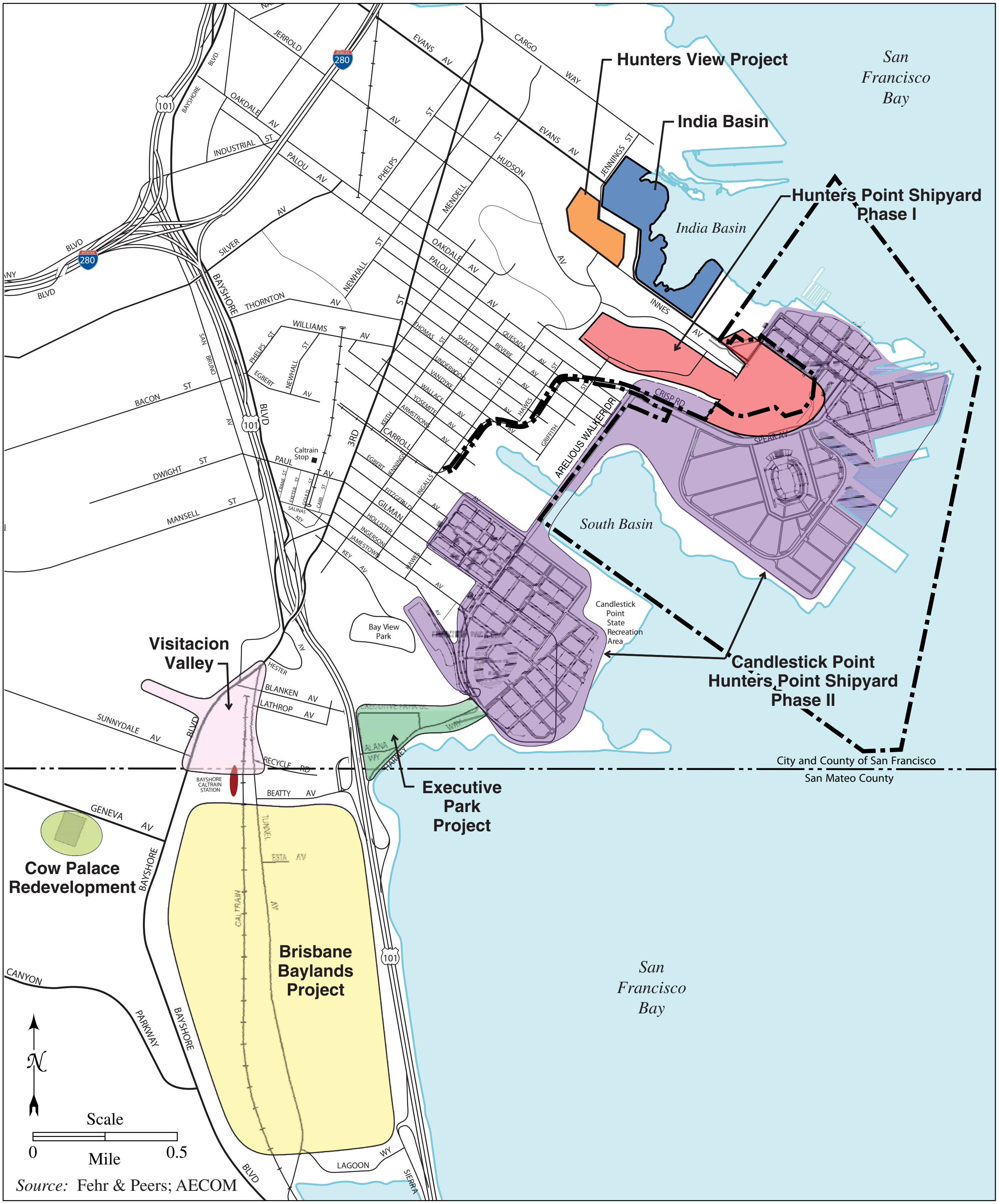


Figure 4.1.1-1. Proposed Nearby Developments

4.1.1.2.3 Future 2030 Cumulative Condition

The future 2030 cumulative condition represents the 2030 baseline conditions with the addition of the proposed action travel demand and includes transportation improvements that would be implemented as part of the proposed action. Figures 4.1.1-2 and 4.1.1-3 show the future baseline conditions for weekdays (A.M. and P.M.) and Sundays respectively.

Future 2030 Transportation Improvements Proposed as Part of the Proposed Action

The land use program and transportation program developed for the proposed action consists of strategies to contain as many trips as possible within HPS and to maximize the usefulness of walking and bicycling; a parking plan designed to discourage the overall usage of private automobiles; increased transit service; and a Transportation Demand Management (TDM) Plan.

The following are a few features of the proposed action designed to promote pedestrian, bicycle, and transit travel:

- The development pattern is designed to facilitate walking and cycling for internal trips, and bus service for trips elsewhere;
- Streets are designed to support a variety of travel modes at moderate to low speeds, and are arranged in a pedestrian-oriented grid of small blocks;
- All of the homes within each community are within a 15-minute walk of a transit stop, where frequent service would be available; and
- New and improved transit service would be provided to the project site.

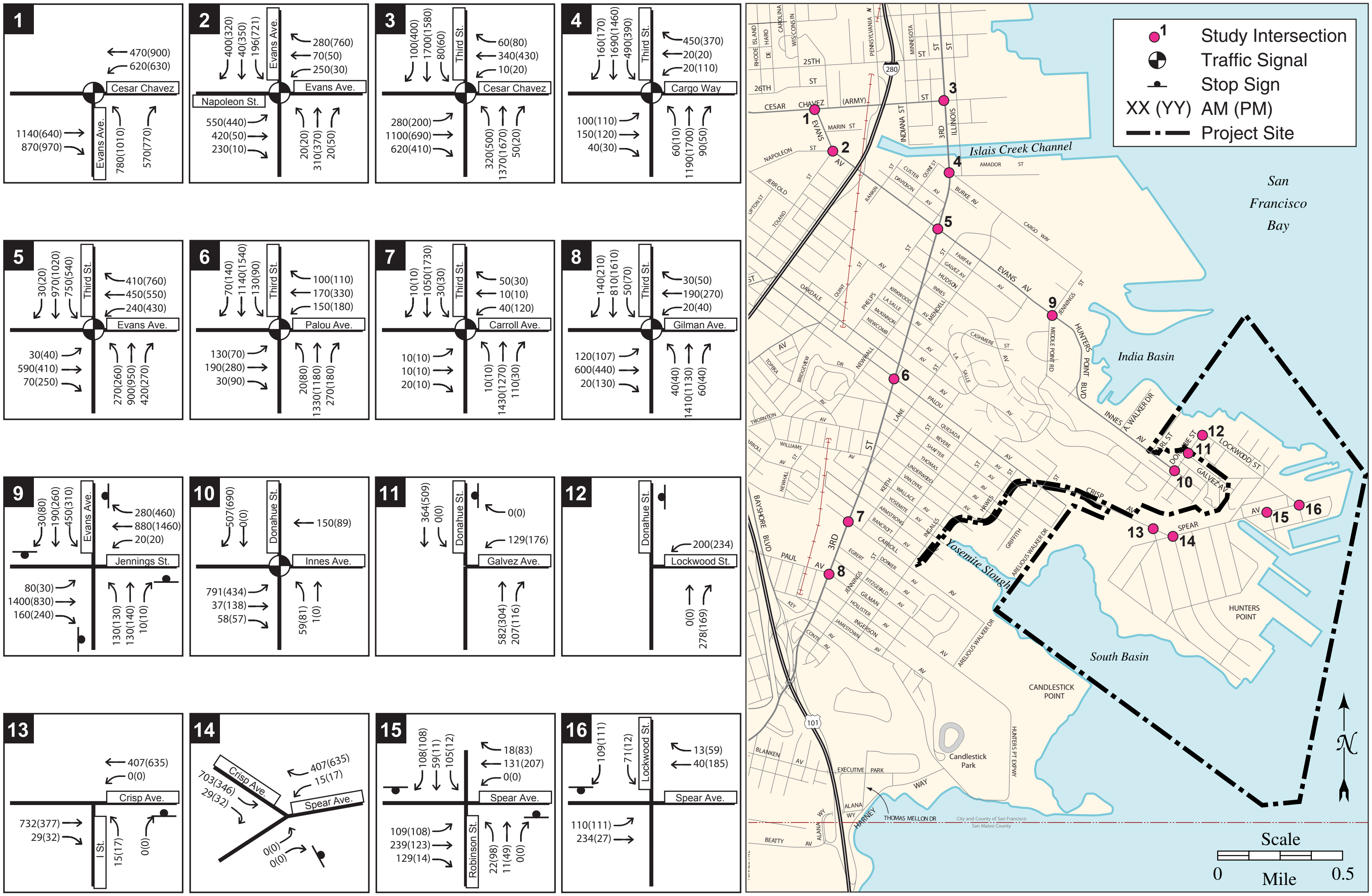
There is also an extensive list of transportation improvements that, while outside HPS, are in the immediate vicinity. Some of these transportation improvements would improve traffic operations, while others would increase roadway and transit capacity in the Bayview area, which would benefit all users accessing HPS. While these are proposed as part of city plans or other developments, DoN would not be responsible for funding or implementing these improvements.

The internal street network and external roadway improvements were designed to support transit, bicycle and pedestrian circulation. Proposed onsite and external transportation improvements are discussed below.

Roadway Improvements

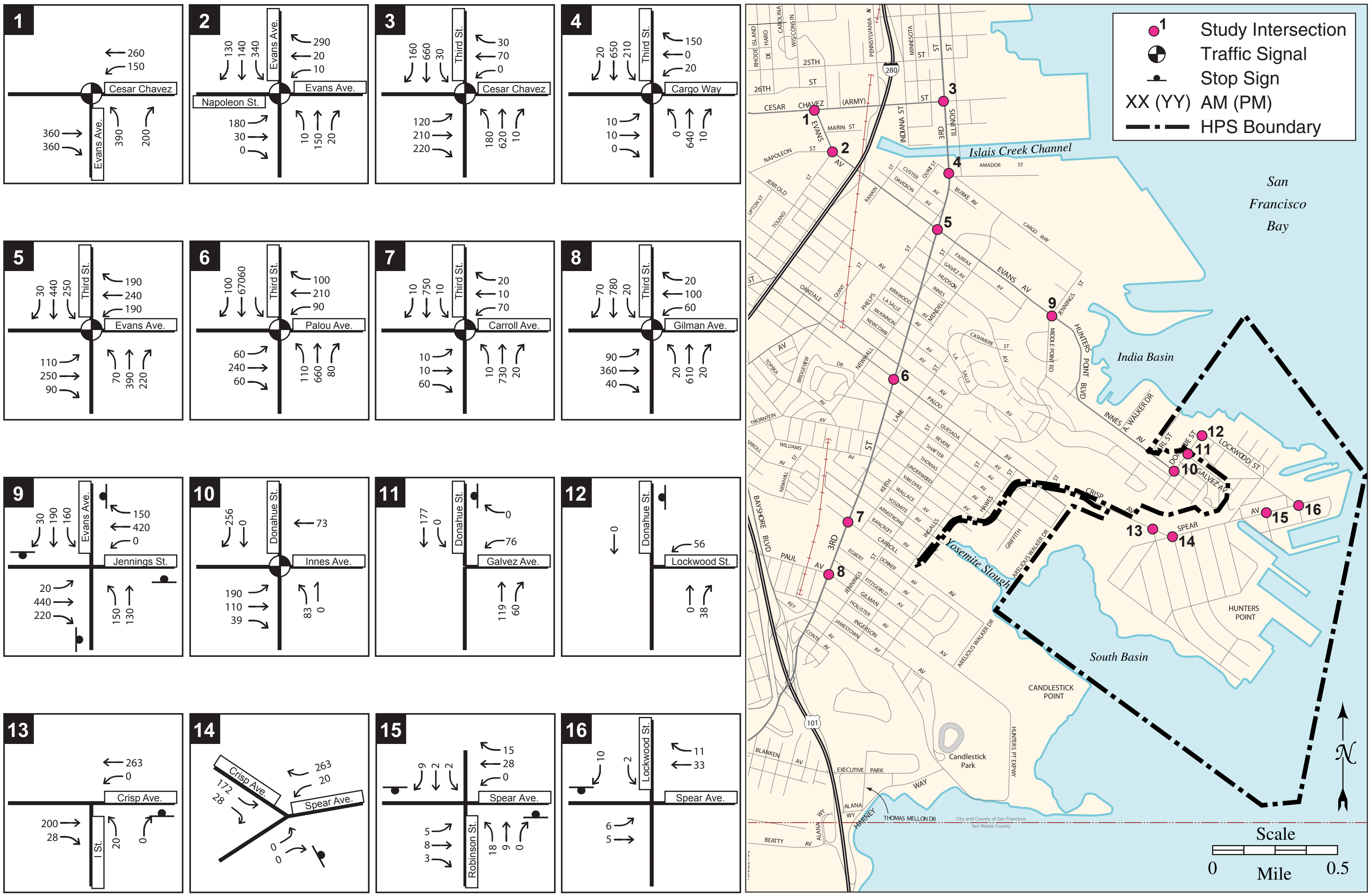
The proposed action would involve reconstruction of most of the streets within HPS. The street network proposed for HPS would be an extension of the existing grid of the adjacent Bayview neighborhood, using typical Bayview block sizes. Within HPS, the street grid would be aligned to focus on connections to the waterfront. The proposed action's roadway cross-sections were designed to safely accommodate multi-modal transportation within the project site, and include roadway and streetscape improvements on roadways outside of the project site. The proposed action's street layout and roadway cross-sections are consistent with the *Better Streets Plan,* except in few locations where unique right-of-way requirements have placed constraints that limit wider sidewalks, such as along steep hillsides or the bay shoreline (San Francisco Planning Department 2008a).[2]

[2] 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.



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.1-2. Future 2030 Baseline Weekday A.M. and P.M. Peak Hour Traffic Volumes



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.1-3. Future 2030 Baseline Sunday P.M. Peak Hour Traffic Volumes

The HPS arterial streets would function as the primary thoroughfares of the project site 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 HPS. Automobiles would not be permitted to use the Yosemite Slough bridge except on game days and would instead be routed via Carroll Ave, Ingalls St, Thomas Ave, and Griffith St. The local streets that form the balance of the street network would be Neighborhood Residential streets.

HPS would be served by a four-lane roadway extension of Thomas Ave connecting to Arelious Walker Dr and Crisp Rd via Griffith St. Ingalls St would contain two travel lanes and on-street parking/loading on both sides of the roadway. The existing portion of Thomas Ave would be converted from a two-lane to a four-lane facility. On Thomas Ave, parking would be retained on both sides of the roadway. Innes Ave east of Donahue St 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).

Offsite Roadway Improvements

Offsite roadway improvements related to the proposed action are identified in Figure 4.1.1-4 and described below. These offsite improvements would be outside of the DoN property at HPS. The transportation improvements would be the responsibility of the future developers of HPS and/or the City and County of San Francisco. DoN would have no role or responsibility in the funding, planning, design, or construction of any offsite transportation improvements or onsite transportation improvements following disposal of the HPS property.

Harney Way Widening. The existing four-lane Harney Way would be widened to contain between two and three travel lanes in each direction, turn pockets, two bus rapid transit (BRT)-only lanes, Class I and Class II bicycle facilities, new sidewalks, and landscaped area. Initially, the roadway would be rebuilt as a five-lane roadway (with right-of-way reserved for additional lane(s) to be built in the future as needed for increased traffic levels). The BRT lanes would be separated from the roadway by a 6 ft (2 m) median that would widen to 10 ft (3 m) at the proposed BRT stops to allow for a passenger-loading platform. After games at the new stadium, left turns would be prohibited at the two Harney Way intersections with Thomas Mellon Dr and Executive Park Blvd 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 Dr, if necessary.

Yosemite Slough Bridge. A new bridge would extend Arelious Walker Dr from Candlestick Point to HPS. The bridge would have an 81-ft (24 m) wide right-of-way and would contain a 40-ft (12-m) wide landscaped greenway, two 11-ft (3.3-m) wide BRT lanes, a sidewalk, and a Class I bicycle path. On football game days, the 40-ft (12-m) 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 sidewalk and Class I bicycle path would provide a direct connection between Candlestick Point and HPS for pedestrians and bicyclists at all times and would reduce the potential for conflicts between BRT vehicles and motorists, pedestrians and bicyclists.

Figure 4.1.1-4. Proposed Roadway Improvements

During game days, the 40-ft (12-m) wide landscaped median would serve as the primary and most-direct route between the stadium parking areas and US-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.

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 stadium before and after games. These roadways include Innes Ave, Robinson Ave, and Fisher Ave on the north side of HPS; Crisp Rd on the southern side of HPS; Griffith St, Thomas Ave, and Ingalls St between HPS and Candlestick Point; and Arelious Walker Dr 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, except for the Yosemite Slough bridge, 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.

Additional improvements would include streetscape improvements and installation of 14 new traffic signals at existing unsignalized intersections as part of the transit preferential treatment[3] on Palou Ave, or when traffic volumes warrant signalization. Installation of traffic signals would improve traffic operations at these intersections but would not affect the roadway capacity. The following includes a list of intersection improvements in the immediate vicinity of HPS and would potentially affect key routes to and from HPS.

Evans Ave/Jennings St/Middlepoint Intersection: In addition to signalization, the proposed action would revise the existing lane configuration on the Evans Ave and Jennings St approaches, as follows.

- Reconfigure the existing three travel lanes on Evans Ave for both the eastbound and westbound approaches to provide a shared through and left-turn lane, a through lane, and a right-turn lane. Since there are no bicycle lanes or on-street parking, this reconfiguration of the existing lanes would not impact parking or bicycle travel; and
- Reconfigure the southbound approach of Jennings St to Evans Ave 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 ft (50 m) of on-street parking on the west side of Jennings St, which would eliminate about eight to ten parking spaces.

Palou Ave/Griffith St/Crisp Rd intersection: In addition to signalization, the proposed action would revise the existing lane configuration on the westbound Crisp Rd, eastbound Palou Ave, and northbound Griffith St approaches, as follows.

- Remove the southwest leg of Crisp Rd and create limited access for the eastern block of Palou Ave. The Crisp Rd westbound approach would be restriped to provide two approach lanes, a left-turn lane, and a shared left/through/right lane; and
- Reconfigure the northbound Griffith St approach to provide two lanes, a shared left/through/right-turn lane, and a right-turn lane; reconfigure the eastbound approach of Palou Ave to provide two approach lanes, a left-turn lane, and a shared through and right-turn lane. Reconfiguration of the northbound approach would eliminate about 200 ft (60 m) of on-street parking (eight to ten parking spaces) on the east side of Griffith St.

[3] 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.

Transit Improvements

Future transit improvements are illustrated in Figure 4.1.1-5. The improvements are described below.

The final configuration of new and improved transit services would be determined under the purview of SFMTA. Connections to the regional transit network (BART and Caltrain) would serve employment centers in the South Bay. BART and Caltrain stations south on the San Francisco Peninsula are generally well-served by local bus routes and would provide connections to workplaces. Many of the proposed transit lines would include transit priority systems with roadway sensors that would detect approaching transit vehicles and would alter signal timing to improve transit efficiency. The proposed action would include the following transit improvements, illustrated in Figure 4.1.1-5 and described below. The transportation improvements associated with proposed action would be the responsibility of the future developers of HPS and/or the City and County of San Francisco. DoN would have no role or responsibility in the funding, planning, design, or construction of any offsite transportation improvements or onsite transportation improvements following disposal of the HPS property.

- *New and Expanded Bus Routes.* Existing Muni routes 24, 44, and 48 would be extended into HPS and service frequencies would be increased to accommodate greater demand. A new Downtown Express route between HPS and the Financial District would be introduced.
- *Hunters Point Transit Center.* The Hunters Point Transit Center would serve HPS North and the HPS Village Center districts. Three routes would be extended into the proposed Hunters Point Transit Center: the 24-Divisadero, the 44-O'Shaughnessy, and the 48-Quintara-24th St. The transit center would consist of a bus terminal with approximately ten bus bays. Most bus lines serving HPS would terminate at the transit center.

In addition, there would be other transit improvements included in the 2030 cumulative conditions. These transit improvements would be required to accommodate other redevelopment plans and development projects in the area. These additional transit improvements could include:

- *T-Third St LRT Line*: Covert the T-Third St LRT line from one to two-car trains, but no change in service frequencies;
- *CPX-Candlestick Express*: Add a new express route from Candlestick to downtown San Francisco;
- *Palou Ave Transit Priority Treatment*: Muni route 24-Divisdero would be extended along Palou Ave to serve the Hunters Point Transit Center. Transit-priority technology would be installed on Palou Ave including installation of new traffic signals. This would improve transit travel times and reliability on the 24 line and also for the 23 and 54 lines, which would continue to operate on Palou Ave but would not be extended into HPS;
- *Harney/Geneva BRT/Transit Preferential Street*: The Harney Way/Geneva Ave corridor would have BRT exclusive bus and BRT lanes between the Hunters Point Transit Center and Bayshore Blvd, through Candlestick Point and the Bayshore Caltrain Station; and
- *Bus Rapid Transit Stops*: BRT stops would be at the Hunters Point Transit Center, three locations within Candlestick Point, and at two intermediate locations.

Bicycle Circulation

Bicycle routes would provide connections within the project site, surrounding neighborhoods, and other parts of the city. Bicycle routes would be established along major roadways consistent with city guidelines and adopted bicycle plans and would connect with existing routes. The proposed action's

Figure 4.1.1-5. Proposed Transit Improvements

improvements on Innes Ave would overlap with Bicycle Plan Project 4-4, Innes Ave Bicycle Lanes; however, the proposed action's improvements would be consistent with the Bicycle Plan. The Bay Trail would be extended along the entire HPS waterfront. The proposed action would construct the Bay Trail through the project site and support the proposed waterfront trail connection route within the Gap Analysis Study area, connecting the existing trail south of the project site ultimately to the existing northern trail along the India Basin shoreline. There would be secure bicycle parking in each commercial parking facility and residential garage. New buildings with at least 10,000 ft^2 (930 m^2) of office and community uses would provide showers and locker facilities. The proposed bicycle route network is presented in Figure 4.1.1-6. Bicycle facilities are described as Class I, which is a separated bicycle path or multi-use trail; Class II, which is a bicycle lane; and Class III, which is a bicycle route.

Pedestrian Circulation

The pedestrian network would actively encourage walking as a primary mode of transportation within the project site. Pedestrian facilities such as sidewalk and multi-use pathways would allow access to transit facilities and to shopping, schools, and recreation. The roadway network would include traffic calming devices and designs to facilitate safe pedestrian travel. The streets would be designed to accommodate multi-modal travel with curb extensions, corner extensions (or bulb-outs), raised crosswalks, comprehensive signage, street trees, narrow roadway lanes, and short blocks. All pedestrian facilities would meet ADA standards for accessibility and would be designed to conform to San Francisco's "Better Streets Plan" when possible. The proposed pedestrian circulation plan for HPS is presented Figure 4.1.1-7.

Transportation Demand Management Plan

A TDM Plan would be implemented to reduce automobile and light truck vehicle miles traveled, reduce use of single-occupant vehicles, and encourage residents, employees, and visitors to use alternative modes of travel, such as public transit, walking, and bicycling. In addition, the TDM Plan would include measures to reduce the demand for travel during peak times. The TDM Plan would include the following strategies:

- *Employee TDM Programs*. Employers of 20 or more employees 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.
  - *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. "Real-time" monitors would be located near transit hubs, at outdoor transit shelters and inside lobbies, employment areas and other sheltered, well-lit areas where transit patrons can wait in relative comfort within immediate sightline of the transit stop or station.
  - *Commuter Benefits*. The TDM program would include participation in the Commuter Benefits program for tax-free paycheck deductions of transit and bicycle commuter expenses.
  - *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.
- *Carpool/Vanpools*. Through their TDM program and in collaboration with the Onsite 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 Onsite Coordinator's TDM website, brochures, and targeted marketing.

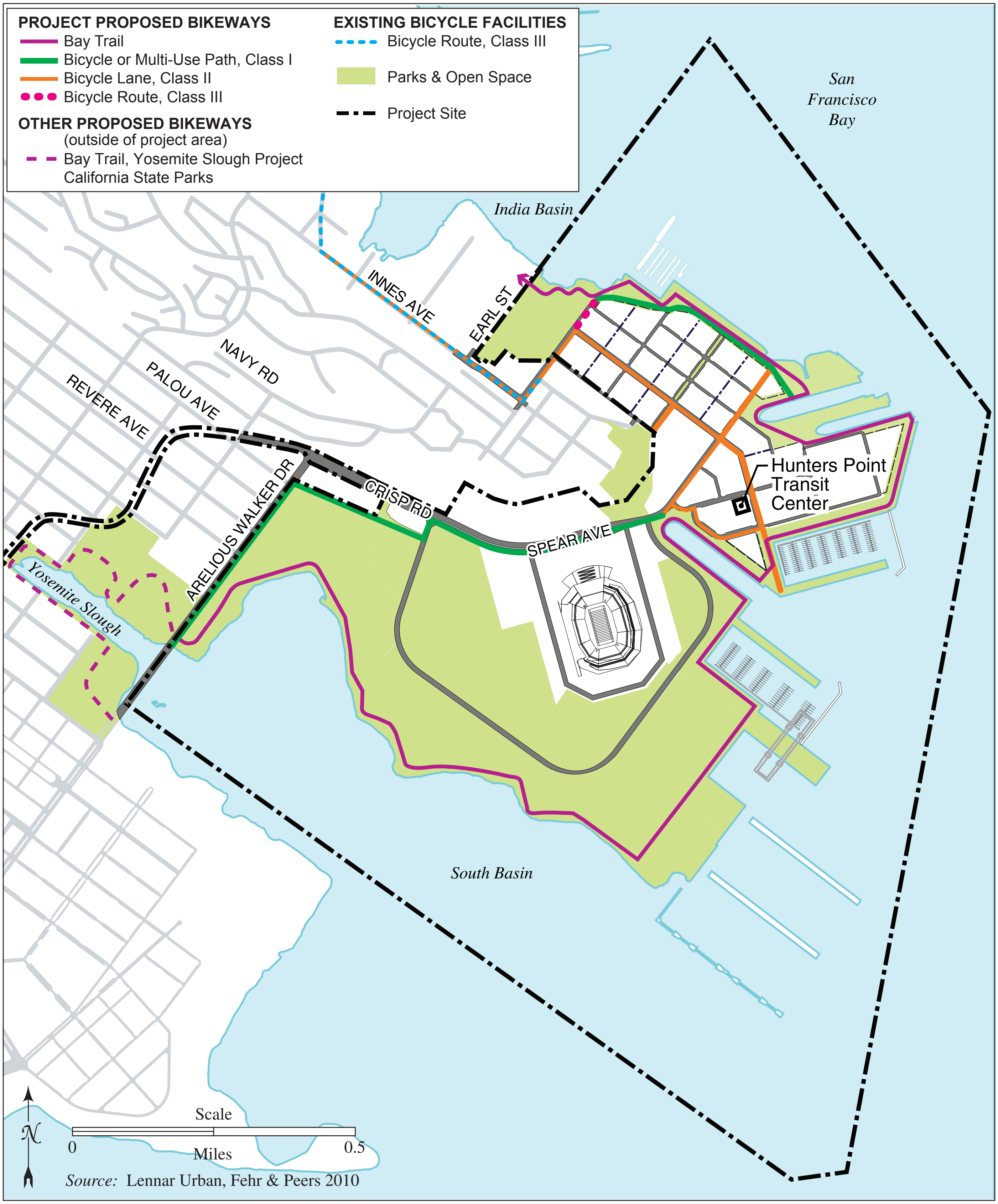


Figure 4.1.1-6. Bicycle Circulation Plan

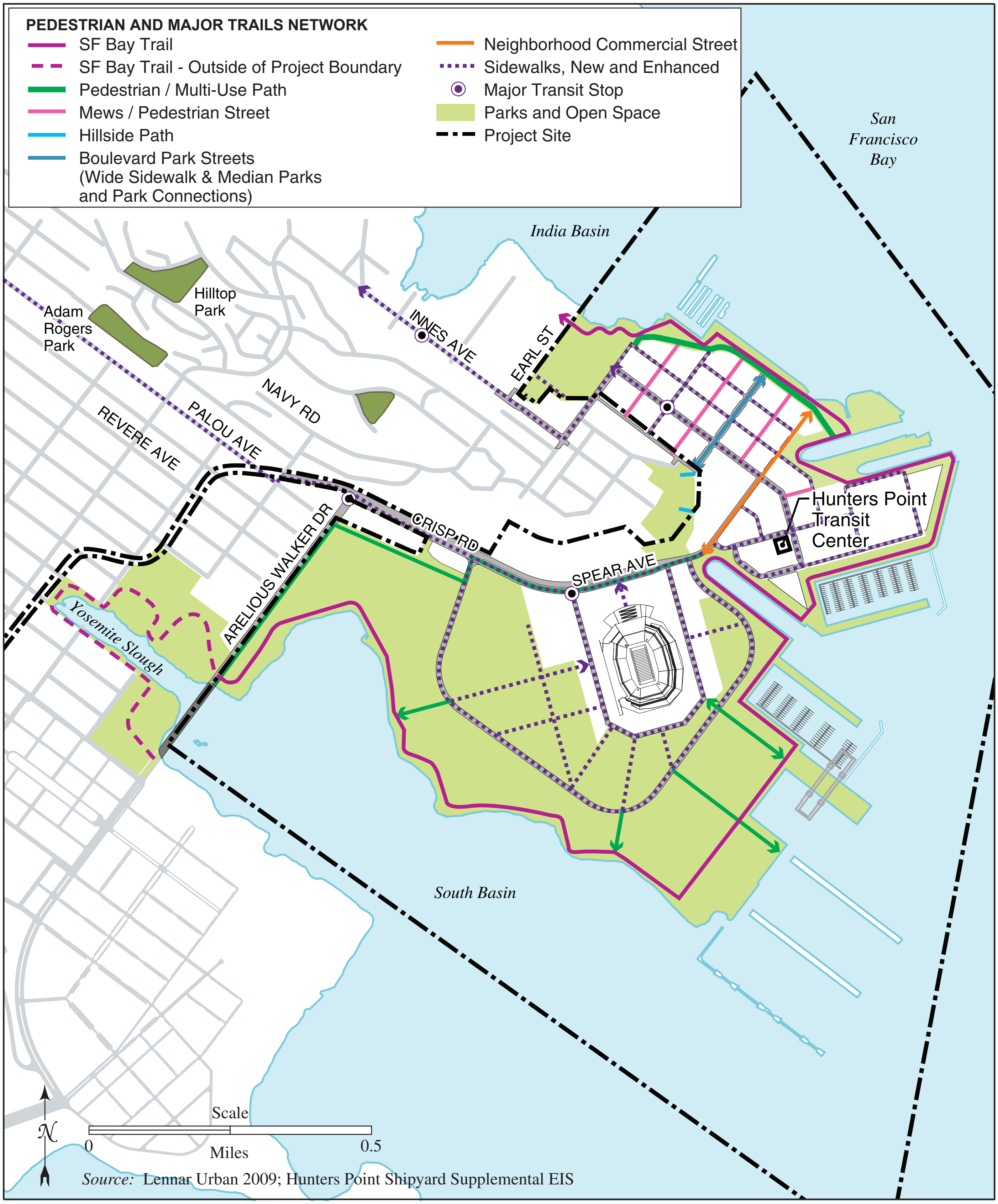


Figure 4.1.1-7. Pedestrian Circulation Plan

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

- *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.
- *Other Strategies*.
  - Homeowner's dues would include the cost of transit passes for all households. The transit pass or "EcoPass" would offer significant benefits including a group discount (transit pass costs, while mandatory, would be priced substantially 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.
  - Provide information outreach to residents, employees and visitors on transit options.
  - Residential parking would be "unbundled" and sold or leased separately from the residential units.
  - Vary non-residential parking charges according to market rates.
  - Operate exclusive bike lanes and frequent BRT service in dedicated lanes and with signal priority.
  - 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 Transit Center), and potentially a bike sharing or rental program.
  - A comprehensive wayfinding signage program would support the network of walkways and shared-use paths, encouraging pedestrian and bicycle trips.

The TDM Plan would include the following implementation and monitoring strategies:

- *CP-HPS Transportation Management Association*. A Transportation Management Association (TMA) would be formed to develop, implement, operate, and administer strategies and programs to manage transportation resources in accordance with the Transportation Demand Management Plan.
- *Onsite Transportation Coordinator and Website*. An Onsite 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 improving on the measures of the TDM Plan and serve as a liaison to city staff for all transportation concerns/communication needs. The coordinator would maintain a website to include transportation-related data and real-time transit information.
- *Targeted Marketing*. A plan would be in place to help people discover alternatives to driving alone in a car. The Onsite 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. 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.

- *Monitoring of Transportation Demand*. Transportation measures and programs would be monitored on an annual basis to evaluate the success of the programs and to potentially make decisions about the allocation of resources or changes in the services that may be needed to better address the needs of the project site. The objective of monitoring would be to maximize the use of alternatives to the single occupant automobile and reduce peak hour congestion. Monitoring could include user surveys, automobile counts, transit ridership, and bicycle and car share usage and costs.
- *Monitoring Effectiveness of Congestion-Reducing and Traffic Calming Efforts*. Annually review the effectiveness of the proposed action's transportation measures and other traffic calming measures implemented in the area to reduce congestion due to proposed action vehicle trips and minimize traffic spillover to neighboring residential streets. If warranted, consideration would be given to implementation of additional traffic-calming and congestion-alleviating measures.

Table 4.1.1-1 summarizes the transportation improvements for each of the reuse alternatives and the No Action Alternative.

Table 4.1.1-1. Summary of Cumulative Transportation Improvements

Improvement	**Alternative 1** (Stadium Plan Alternative)	**Alternative 1A** (Stadium/No-Bridge Alternative)	**Alternative 2** (Non-Stadium Plan/Additional R&D Alternative)	**Alternative 2A** (Non-Stadium Plan/Housing and R&D Alternative)	**Alternative 3** (Non-Stadium Plan/Additional Housing Alternative)	**Alternative 4** (Non-Stadium Plan/Reduced Development Alternative)	**No Action Alternative**
Harney Widening	X	X	X	X	X	X	--
New and Improved Roadways	X	X	X	X	X	X	--
Streetscape Improvements	X	X	X	X	X	X	--
Yosemite Slough Bridge	X	--	X	X	X	--	--
New Signals and/or Intersection Improvements	X	X	X	X	X	X	--
Transportation Management Plan	X	X	X	X	X	X	--
Extended and New Bus Routes	X	X	X	X	X	X	--
BRT Service	X	X	X	X	X	X	--
Harney/Geneva BRT/TPS	X	X	X	X	X	X	--
Hunters Point Transit Center	X	X	X	X	X	X	--
BRT Stops	X	X	X	X	X	X	--
Palou Ave TPS	X	X	X	X	X	X	--
Bay Trail and Bicycle Improvements	X	X	X	X	X	X	--
Pedestrian Improvements	X	X	X	X	X	X	--
TDM Plan	X	X	X	X	X	X	--

Source: CHS Consulting Group, *et al*. 2009.

Future 2030 Cumulative Land Use Assumptions

In addition to the land use alternatives for the proposed action, it is assumed that Candlestick Point would be developed concurrently with HPS. Therefore, the 2030 cumulative condition includes development within Candlestick Point. The land use plan for Candlestick Point varies with each proposed action's land use alternative; therefore, the land use plan for Candlestick Point is shown for each alternative. The proposed action and Candlestick Point development plan land use programs are summarized Table 4.1.1-2. It should be noted that the travel demand associated with the residential project currently under construction within HPS is included in both the 2030 future baseline and the 2030 cumulative conditions.

Table 4.1.1-2. 2030 Cumulative Condition – Land Use Summary by Alternative

Land Use		**Alternative 1 (Stadium Plan Alternative)**	**Alternative 1A (Stadium/ No-Bridge Alternative)**	**Alternative 2 (Non-Stadium Plan/Additional R&D Alternative)**	**Alternative 2A (Non-Stadium Plan/ Housing and R&D Alternative)**	**Alternative 3 (Non-Stadium Plan/Additional Housing Alternative)**	**Alternative 4 (Non-Stadium Plan/Reduced Development Alternative)**	**No Action Alternative**
Proposed Action (i.e., Hunters Point Shipyard)								
Residential	(units)	2,650	2,650	2,650	4,275	4,000	1,855	--
Neighbor-hood Retail	(gft^2)	125,000	125,000	125,000	125,000	125,000	87,500	--
R&D	(gft^2)	2,500,000	2,500,000	5,000,000	3,000,000	2,500,000	1,750,000	--
Artists' Studios	(gft^2)[1]	255,000	255,000	255,000	255,000	255,000	255,000	--
Community Services	(gft^2)	50,000	50,000	50,000	50,000	50,000	50,000	--
Park	(ac)	232	232	222	222	245	245	--
Stadium	(seats)	69,000	69,000	--	--	--	--	--
Mixed Use	(gft^2)	--	--	--	--	--	--	--
Cultural and Education	(gft^2)	--	--	--	--	--	--	--
Candlestick Point								
Residential	(units)[2]	7,850	7,850	7,850	6,225	6,500	5,495	256
Neighbor-hood Retail	(gft^2)	125,000	125,000	125,000	125,000	125,000	87,500	--
Regional Retail	(gft^2)	635,000	635,000	635,000	635,000	635,000	444,000	--
Office	(gft^2)	150,000	150,000	150,000	150,000	150,000	105,000	--
Hotel	(rooms)	220	220	220	220	220	154	--
Community Services	(gft^2)	50,000	50,000	50,000	50,000	50,000	50,000	--
Park	(ac)	105	105	105	105	105	103	120
Arena	(seats)	10,000	10,000	10,000	10,000	10,000	10,000	--
Existing Stadium	(seats)	--	--	--	--	--	--	70,000

Notes:

1. Project alternatives include 225,000 ft^2 (20,900 m^2) of existing artists' studio space that would be renovated and replaced.
2. Includes existing 256 units at Alice Griffith housing complex that would be replaced.

Sources: SFRA and Lennar Urban 2010.

Travel Demand Forecasts

This section discusses the travel demand methodology and results for the project alternatives. Travel demand associated with a sell-out football game and a secondary event at the stadium, as well as a sell-out event for the arena is also included in this section.

Methodology

The methodology used to calculate trip generation in the 2000 FEIS differs from the methodology used to calculate trip generation in the SEIS, as follows.

- The 2000 FEIS trip generation was based the *San Francisco Guidelines for Environmental Review: Transportation Impacts, July 1991* (SF Guideline 1991). The trip generation rates and modal split percentages were based on a citywide travel behavior survey conducted in 1992. Assumptions on internal trips were made based on known data nationally; and
- This SEIS used a trip generation forecasting method, commonly referred to as the "4D" method.[4] This method generally accounts for the following factors that may influence travel behavior: development scale, density of the project, diversity of uses, and design of project.

This approach was determined to be appropriate by the San Francisco Planning Department (Appendix D of the CP-HPS DEIR [SFRA 2009]) because the project site:

- Is located in a relatively isolated area within the city and would redevelop an area comparable in size to a number of 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 site is detailed in the *CP-HPS Phase II Development Plan Transportation Study* 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 proposed action and estimates the percentage of those trips that occur internal to the project site. The external trips are used in the offsite impact analysis;
2) *Trip Purpose*: The external trips are separated into work and non-work trips, 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;
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 of transit mode share for each trip type. The 4D model assumed the transit improvements that would be provided as part of the 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

[4] This method was originally developed by Fehr & Peers and others for the USEPA 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).

based on average vehicle occupancy of 1.6 persons per vehicle (assumption based on the 1995 National Personal Transportation Survey); and

6) *Trip Assignment*: After estimating the transit mode share, the number of transit riders were assigned to specific transit routes serving or proposed to serve the study area;

Future 2030 Cumulative Traffic Volumes

TRIPS BY MODE

Table 4.1.1-3 summarizes the peak hour person-trips and vehicle trips during a typical weekday and Sunday for each alternative.[5] Between 28 and 34 percent of weekday A.M. and P.M. 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. During the Sunday P.M. peak hour, fewer trips would be internal to the project site, 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.

As seen in Table 4.1.1-3, Alternative 2 would generate the largest number of vehicle trips, and Alternative 4 would generate the least number of vehicle trips of the alternatives.

Table 4.1.1-3. Person and Vehicle Trips by Mode

Peak Period and Alternative	*Person Trips*					*Vehicle Trips*
	Auto	**Transit**	**Bicycle**	**Internal/ Linked**	**Total**	
Weekday A.M. Peak						
Alternatives 1 and 1A	3,078	845	121	1,789	5,833	1,924
Alternative 2	4,904	1,349	193	2,057	8,503	3,065
Alternative 2A	3,718	1,027	147	2,547	7,439	2,324
Alternative 3	3,271	904	129	2,388	6,692	2,044
Alternative 4	2,503	687	99	1,025	4,314	1,565
Weekday P.M. Peak						
Alternatives 1 and 1A	3,463	1,001	138	1,839	6,441	2,164
Alternative 2	5,014	1,482	201	1,917	8,614	3,134
Alternative 2A	4,204	1,224	168	2,592	8,188	2.628
Alternative 3	3,739	1,082	149	2,540	7,510	2,337
Alternative 4	2,803	813	112	1,057	4,785	1,752
Sunday P.M. Peak						
Alternatives 1 and 1A	2,674	518	99	1,548	4,839	1,666
Alternative 2	4,136	814	123	1,356	6,429	2,585
Alternative 2A	3,031	773	117	2,166	6,087	1,894
Alternative 3	2,765	704	107	2,196	5,772	1,728
Alternative 4	2,338	449	86	956	3,829	1,455

Source: CHS Consulting Group, *et al*. 2009.

TRIP DISTRIBUTION

Table 4.1.1-4 presents the distribution of the weekday A.M. and P.M. transit and vehicle trips to and from San Francisco and areas outside of San Francisco. Trip distribution for the proposed action was based on information obtained from the SF-CHAMP model for the traffic analysis zones included within the HPS

[5] A detailed description of the person and vehicle trips by mode is presented in the *CP-HPS Phase II Development Plan Transportation Study*.

boundaries. During the weekday A.M. and P.M. peak hours, 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. Sunday trip distribution patterns would be similar to those presented for weekday P.M. peak hour conditions. A figure illustrating the trip distribution is included in Appendix L, Transportation, Traffic, and Circulation Resource Data.

Table 4.1.1-4. Weekday A.M. and P.M. Peak Hour Distribution Patterns (Percent)

Description	*Transit Trips*			*Vehicle Trips*		
	Work	**Non-Work**	**Total**	**Work**	**Non-Work**	**Total**
Weekday A.M. Peak						
Downtown CBD	17	10	15	1	2	2
Rest of Superdistrict[6] 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 P.M. 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: CHS Consulting Group, *et al*. 2009.						

Stadium and Arena Travel Demand

The number of person-trips made by spectators to the proposed football stadium and the arena was estimated based on the proposed number of seats and a sell-out condition. For the stadium, travel demand is also presented for a smaller secondary event with an attendance of about 37,500 spectators.

Game Day Travel Demand at the Proposed Stadium

Football game day travel demand estimates were based on a sellout game, when all 69,000 seats are sold. The number of person-trips for a sellout game would be 68,885, including 65,550 spectators[7] plus 725 game operations/media personnel and 2,610 other game day employees (concessions, security, janitorial, etc.).

6 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.

With the relocation of the stadium and provision of new transit service proposed by the proposed action, the mode of travel to the stadium is expected to change compared to existing conditions, with increased use of transit. Based on existing attendance data obtained from the San Francisco 49ers football team at the Candlestick Park stadium and SFMTA, on average 81 percent of the spectators arrive via automobile, and the remaining 19 percent come by transit, including 11 percent on Muni, 5 percent on SamTrans, Santa Clara Transit, and Golden Gate Transit[8], and the remaining 3 percent come by other private charter service (Appendix D of the CP-HPS DEIR [SFRA 2009]). With the new transit service proposed by the proposed action, a modest rise in transit use (from 19 percent to 25 percent) to the stadium was assumed to occur. 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 ratio as patrons (25 percent). In addition to the existing game day transit service provided by Muni and charter bus service, the following transit service was assumed in the travel demand estimates:

- *Harney Way BRT*. The new express service would 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. The BRT service would also offer efficient and convenient access to regional transit service, such as Caltrain and BART;
- *Palou Ave Transit Preferential Street*. On game days Palou Ave would be a dedicated transit-only street to allow buses to proceed to the T-Third St light rail line and points west and north without mixing in congested pre- and post-game traffic; and
- *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 proposed actions' transit plan calls for extending several existing Muni bus routes (i.e., 24-Divisadero, 44-O'Shaughnessy, and 48-Quintara-24th St) to provide regular service into the project site. This service would be part of regularly scheduled service and would not be special game day service. As a result, patrons would be expected to be familiar with the routes.

Table 4.1.1-5 summarizes the number of people onsite by mode of access, and the number of post-game transit and vehicle trips associated with a sell-out game. The number of vehicle trips was determined by dividing the number of attendees that arrive via auto by 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 (Appendix D of the CP-HPS DEIR [SFRA 2009]).

Table 4.1.1-5. Projected Football Game Day Trip Generation by Mode

	Attendees by Mode	*Vehicle Trips*	*Transit Trips*
Spectators			
Auto	49,162	18,134	—
Charter Bus	3,656	—	3,656
Transit	12,732	—	12,732
Subtotal	*65,550*	*18,134*	*16,388*
Employees/Media			
Auto	2,683	2,000	—
Transit	652	—	653
Subtotal	*3,336*	*2,000*	*653*
Total	**68,885**	**20,134**	**17,041**
Source: CHS Consulting Group, *et al*. 2009.			

7 The number of spectators 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 of 5 percent), resulting in an actual attendance of 65,550 for a sellout game

8 In 2008 and 2009, game day SamTrans, Golden Gate Transit, and VTA transit service have been replaced with private charter. Ridership is expected to remain similar.

Alternative 1 would provide 17,415 parking spaces dedicated for game day use (340 reserved for buses and 17,075 for private autos, RVs, limos, etc.). As a result, 3,059 vehicles of the total unconstrained demand of 20,134 would not be able to park onsite on game days. These vehicles would likely park elsewhere and their occupants would either walk or take transit into the stadium area. Therefore, the number of vehicles exiting the project site following a football game was determined based on the constrained parking supply of 17,075 vehicles (most conservative scenario; everyone leaves at end of game). Existing stadium departure patterns show five percent of spectators stay later, which would result in 14,510 vehicles exiting the project site immediately after a football game. Therefore, for a sell-out game, the demand for vehicles exiting the hour immediately following the end of the game would roughly range between 14,500 vehicles (assuming some early and some late departures) and 17,100 vehicles (if everyone attempted to leave at the end of the game). A typical end time for a Sunday football game is 4:00 P.M.

The geographic distribution of spectators was obtained from information provided by the San Francisco 49ers on their season ticket holders. Since the vast majority 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 (Appendix D of the CP-HPS DEIR [SFRA 2009]).

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 stadium. A typical secondary event at the new stadium could occur at any time of day and on any day of the week consistent with the city's regulations on time restriction, with an expected crowd ranging from 15,000 to sell-out conditions. For purposes of the transportation analysis, this would be a concert event with up to with 37,500 spectators. Assuming a weekday evening start time of about 7:00 P.M., the weekday P.M. peak hour (5:00 to 6:00 P.M.) was analyzed for pre-event conditions to address possible transportation impacts associated with P.M. commute traffic conditions. It is assumed that approximately 20 secondary events would occur per year (Appendix D of the CP-HPS DEIR [SFRA 2009]).

For secondary events, it is assumed that only regularly scheduled transit service would be provided by Muni and only a small percentage of private charter buses would be expected. The analysis assumes transit mode share for a secondary event at the stadium also would be about 25 percent. An event with 37,500 spectators is likely to generate about 28,125 persons coming by autos and 9,375 persons taking transit. Assuming that the average number of spectators per auto would be similar to that for football spectators in the general seating section (i.e., three spectators per auto), the number of vehicles would translate to 9,375 vehicles to the stadium; including employees, it would be up to 10,100 vehicles.

Based on a technical paper on major event traffic (ITE 1997), the anticipated arrival distribution of non-football event spectators is as follows:

- Three hours prior to event start time: 25 percent;
- Two hours prior to event start time: 50 percent; and
- One hour prior to event start time: 25 percent.

It is assumed that 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 to the site earlier than 5:00 P.M.

The geographic distribution of trips associated with a secondary event would vary depending on the event. 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.

LOADING DEMAND

The SF Guidelines[9] 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 ft^2 (93 m^2) were calculated based on the rates contained in the SF Guidelines, then converted to hourly demand based on a nine-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 4.1.1-6 presents the projected number of trucks generated by the proposed action land uses on a daily basis and the demand for loading dock spaces during the peak hour of loading activities.

Table 4.1.1-6. Projected HPS Loading Demand

HPS	*Daily Truck Generation*	*Peak Hour Loading Dock Space Demand*
Alternatives 1 (Stadium Plan Alternative) and 1A (Stadium Plan/No-Bridge Alternative)	713	41
Alternative 2 (Non-Stadium Plan/Additional R&D Alternative)	1,238	72
Alternative 2A (Non-Stadium Plan/Housing and R&D Alternative)	713	41
Alternative 3 (Non-Stadium Plan/Additional Housing Alternative)	766	44
Alternative 4 (Non-Stadium Plan/Reduced Development Alternative)	518	30
No Action Alternative	--	--

Source: CHS Consulting Group, *et al*. 2010.

4.1.2 DoN Disposal

The disposal of HPS would not result in any direct changes in traffic conditions. However, the direct impacts of reuse, described below, would be the indirect impacts of disposal.

4.1.3 Alternative 1: Stadium Plan Alternative

This section describes the construction and operational impacts for Alternative 1. Alternative 1 includes a wide range of uses including residential, retail, office, R&D, civic and community uses, parks and recreational open space, a 300-slip boat marina, and a new football stadium. Transportation improvements associated with the proposed action are outlined in prior sections.

In addition to the typical peak hour analyses (weekday A.M., weekday P.M., and Sunday P.M. peak hours), Alternative 1 analyzes Sunday game day and weekday secondary stadium event transportation impacts as well as weekday P.M. peak hour transportation impacts associated with the proposed arena on the Candlestick Point development.

Alternative 1 would generate 1,924 weekday A.M., 2,164 weekday P.M., and 1,666 Sunday P.M. peak hour vehicle trips.

[9] SF Guideline, published by the San Francisco Planning Department, provides approaches and assumptions for transportation impact analysis for en environmental document. This document reflects the most current data available regarding San Francisco travel characteristics. SF Guidelines includes methods and assumptions for truck trip generation analysis.

4.1.3.1 Construction Impacts

Build-out of HPS would be expected to occur over a 20-year period between 2012 and 2032 (MACTEC 2010). Initial construction activities would include demolition of existing structures, utility relocation, and site clearance and grading at HPS 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.

4.1.3.1.1 Factor 1: Construction Vehicle Traffic and Roadway Impacts

Construction of Alternative 1 would occur in several overlapping phases. 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 Alternative 1 conditions at full build-out.

During construction of Alternative 1 phases, building activities would generate traffic volumes from construction workers, truck deliveries of supplies and construction equipment, and the hauling of soils during grading and excavation. The peak phases of construction activities would occur between 2013 and 2017, when grading and infrastructure improvements would be ongoing at HPS. During this phase, between 15 and 455 construction workers would be onsite on a daily basis, and up to 288 construction truck trips would travel to and from the site on a daily basis.

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.[10] 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 onsite, 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 travel depends on the location of individual construction sites, it is expected that Innes Ave, Evans Ave, Cesar Chavez St, and Third St would be the primary haul routes between US-101 and HPS. In general, construction-related transportation impacts would include impacts in the immediate vicinity of the project under construction, on roadways within HPS, and cumulative construction traffic impacts along the roadways in the BVHP neighborhood. Since Alternative 1 includes building construction as well as construction of a new street system and transit route extensions into HPS, all construction operations would include traffic control plans for the closure

[10] The San Francisco Noise Ordinance permits construction activities seven days a week, between 7:00 A.M. and 8:00 P.M.

of traffic/parking/bike lanes and sidewalks adjacent to construction sites. The closure of sidewalks and parking/bike lanes could last throughout the entire construction phase for each building or group of buildings. It is possible that more than one location within HPS 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 Ave and Giants Dr, the 54-Felton on Ingalls, the 23-Monterey and 44-O'Shaughnessey on Palou Ave, and the 19-Polk on Innes Ave). Temporary and intermittent interference to transit operations caused by increased truck movements to and from the construction sites could 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 project vicinity. Since bicycle traffic in the project vicinity is relatively low, this impact is not anticipated to be significant. Every effort would be made to accommodate bicycle traffic during construction by the future developer or owner of the property and would be reviewed and approved by the SFMTA and DPW prior to initiation of construction. 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 substantially affect pedestrian circulation. Temporary pedestrian walkways would be maintained by the future developer or owner of the property and would be reviewed and approved by SFMTA and DPW in order to facilitate pedestrian movements.

The construction activities associated with HPS would overlap with construction activities of other development projects in the area, notably Candlestick Point, the Executive Park site, Brisbane Baylands, Visitacion Valley, India Basin Shoreline, and the Hunters View site. The HPS construction activities would also overlap with nearby planned transportation improvement projects, such as the US-101/Harney interchange improvements and the Geneva Ave 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 Ave for the Executive Park project and for development within Candlestick Point, and on Cesar Chavez St and Evans Ave for the India Basin Shoreline, Hunters View project, and development within HPS. For example, construction activities at 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 proposed action's construction period, and the lack of certainty about the timing of other projects in the area, significant project-related and significant project contributions to cumulative traffic and circulation impacts could occur on some roadways, such as US-101, Cesar Chavez St, and Evans Ave. Cumulative impacts would include construction detours and increased travel times; 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. Mitigation 1, described below, would minimize transportation impacts from Alternative 1 development. Nevertheless, 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.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 1 would not be different for these variants.

Mitigation Measure

Mitigation 1. Develop and implement HPS Construction Transportation Management Plan (TMP).

The future developer or owner of the property would develop and implement an HPS Construction TMP in cooperation with the City and SFRDA to minimize impacts of the project and its contribution to cumulative impacts related to construction activities and construction traffic. Some of the key benefits of a TMP are to help:

- Address the broader safety and mobility impacts of work zones and minimize the traffic and mobility impacts;
- Promote more efficient and effective construction phasing and staging;
- Improve work zone safety for construction workers and the traveling public;
- Improve public awareness; minimize complaints from the traveling public and local businesses and communities; and minimize circulation, access, and mobility impacts to local communities and businesses;
- Improve intra- and inter-agency coordination; and
- Identify responsibilities and actions.

The TMP would 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 providing a safe work zone and safely accommodating the traveling public in the area. The TMP would supplement and expand, rather than modify or supersede any manual, regulations, or provisions set forth by Caltrans, SFMTA, DPW or other city departments and agencies.

Preparation and implementation of the TMP identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) and the cost of the implementation would be the responsibility of the future developer or owner of the property, and would be reviewed and approved by SFMTA and DPW prior to initiation of construction. The TMP would be implemented at first sub-phase application and updated with each subsequent sub-phase application. The SFMTA, DPW, the City and County of San Francisco, and DBI would be responsible for the enforcement of the mitigation and the City and County of San Francisco and DBI would be responsible for the compliance monitoring throughout the construction period. The TMP is a living document; as such, the future developer or owner of the property would update the TMP prior to approval of development plans for each phase of construction to reflect any changes to the project development schedule, indicate any transportation network changes, update the status of other development construction activities, and reflect any changes to city requirements.

The TMP would:

- Identify construction traffic management practices in San Francisco, as well those in other jurisdictions that, although not being implemented in the city, could provide useful guidance for a project of this size and character;

- Describe procedures required by different departments and/or agencies in the city for implementation of a construction TMP, such as reviewing agencies, approval process, and estimated timelines;
- Describe coordination efforts associated with the DoN remediation efforts and scheduling regarding construction vehicle routing via the Crisp Rd 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 BVHP area. These could include construction strategies, demand management strategies, incident 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; and
- Present guidelines for selection of construction traffic management strategies.

Implementation of **Mitigation 1** would help minimize the project alternatives' 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 1**, and it is possible that significant construction-related transportation impacts on local and regional roadways could still occur.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic, and transportation impacts would not be different for this variant.

4.1.3.2 Operational Impacts

4.1.3.2.1 Overview of Transportation Improvements Included as Part of the Project

Alternative 1 would generate an additional 1,924 weekday A.M. peak hour, 2,164 weekday P.M. peak hour, and 1,666 Sunday P.M. peak hour vehicle trips. The estimates of these vehicle trips include the development and implementation of a TDM Plan and a final Transit Plan as part of the project. The travel demand analysis and the number of vehicle trips assumed in the traffic impact analysis reflects implementation of the project TDM Plan and final Transit Plan to encourage transit use and discourage use of single-occupant vehicles. Even with the project TDM Plan and final Transit Plan, implementation of Alternative 1 would result in substantial increases in vehicle and transit trips that would result in significant and unavoidable traffic impacts at local intersections, freeway mainline segments, ramp junctions, and transit routes as shown in Tables 4.1.3-1, 4.1.3-2, 4.1.3-3, and 4.1.3-8. To minimize the potential for an increase in project-generated vehicles and the risk that the proposed action's transportation impacts exceed those presented in the sections below, implementation of the specific elements of the project TDM Plan and final Transit Plan would be required; therefore, both plans are included as mitigation measures to ensure they would be prepared and implemented.

4.1.3.2.2 Factor 2: Increase in Traffic Volumes

Project Travel Demand Management Plan

Implementation of Alternative 1 would cause an increase in commute traffic during A.M. and P.M. peak hours and the Sunday P.M. peak hour respectively. This increase would be substantial relative to the existing and proposed capacity of the street system, even with implementation of a TDM Plan. Although the components of a TDM Plan are discussed in Section 4.1.1.2.3, a final TDM Plan has not been formally approved.[11] So that

[11] A draft TDM has been prepared and its elements are summarized above in Section 4.1.1.2.3.

that an effective TDM Plan is implemented, **Mitigation 2** articulates what kind of TDM actions would be necessary and requires preparation, approval, and implementation of the final TDM Plan as part of the approval of the proposed action.

With implementation of **Mitigation 2**, alternative modes would be encouraged, the use of single-occupant vehicles would be discouraged, and the impact of additional vehicles generated by Alternative 1 would be lessened. However, Alternative 1 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. The project and project's contribution to traffic would *remain significant and unavoidable* with mitigation.

Mitigation Measure

Mitigation 2. Prepare and implement the final project TDM Plan.

The future developer or owner of the property would prepare and implement a final TDM Plan in cooperation with the City and County of San Francisco, which would 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;
- Onsite Transportation Coordinator and Website;
- Targeted Marketing;
- Monitoring of Transportation Demand; and
- Monitoring Effectiveness of Congestion-Reducing and Traffic-Calming Efforts.

Implementation of the final TDM Plan identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the future developer or owner of the property. Implementation of the TDM Plan would be funded either by the future developer or owner of the property, or the Transportation Management Association (TMA). The final TDM Plan would be approved as part of the Disposition and Development Agreement (DDA), and the timing of mitigation components would be specified within the final TDM Plan. The City and County of San Francisco would be responsible for enforcement of the mitigation, and the City and County of San Francisco and CP-HPS TMA would be responsible for the compliance monitoring. The City and County of San Francisco would confirm establishment of the TDM Plan as part of the DDA and the future developer or owner of the property would be required to coordinate with the TMA to submit periodic status reports to the City and County of San Francisco demonstrating compliance as specified in the TDM Plan.

Intersection Traffic Impacts

An intersection level of service analysis was prepared for traffic operations at the study intersections, freeway segments, and freeway ramps for 2030 conditions. Project impacts were assessed by comparing 2030 conditions with Alternative 1 to 2030 baseline conditions. The "Analysis Approach" section presents the methodology used to determine project impacts and whether the project would contribute substantially (by five percent or more) to significant cumulative impacts. The impacts are classified as follows:

- **Not Significant.** The intersection, freeway, or ramp operates at acceptable levels of service; therefore, no mitigation is proposed;
- **Significant and Mitigable.** There are mitigation measures that could be incorporated that would improve the impact to not significant; and
- **Significant and Unavoidable.** There are no feasible mitigation measures that would improve the impact to not significant. Or, there are mitigation measures that could be implemented but would not reduce the impacts to not significant.

Table 4.1.3-1 presents a comparison of the intersection LOS analysis for 2030 baseline and 2030 cumulative conditions during the weekday A.M. and P.M. peak hours as well as the Sunday P.M. peak hour without game conditions. The magnitude of the impact is based on the worst case. For example, if an intersection has a significant and unavoidable impact in the A.M. and P.M. peaks and no significant impact in the Sunday P.M. peak, the intersection would be considered to have a significant and unavoidable impact. If the project contributes considerably (by 5 percent or more) to an intersection operating at an unacceptable level of service, the intersection would be considered to have a significant impact. Figure 4.1.3-1 shows the weekday A.M./P.M. peak hour intersection volumes, and Figure 4.1.3-2 shows the Sunday P.M. peak hour volumes.

Table 4.1.3-1. Intersection LOS – 2030 Baseline and Alternative 1 Conditions

Intersection		*Peak Hour*	*2030 Baseline*		*Alternative 1*			
			LOS[a]	**Delay/ v/c**[b]	**LOS**	**Delay/ v/c**	**Percent**[c]	**Impact**
City and County of San Francisco Streets								
#1002	Third St/Cesar Chavez St	A.M.	**F**	**>80/1.49**	**F**	**>80/1.63**	**8.5**	●
		P.M.	**F**	**>80/1.45**	**F**	**>80/1.76**	**7.8**	●
		Sun	C	29.2	**E**	**65.6/0.73**	**--**	● PI
#1003	Third St/Cargo Way	A.M.	**F**	**>80/1.21**	**F**	**>80/1.90**	**9.8**	●
		P.M.	**F**	**>80/1.23**	**F**	**>80/1.74**	**8.9**	●
		Sun	C	29.2	C	30.0	--	○
#1004	Third St/Evans Ave	A.M.	**F**	**>80/1.13**	**F**	**>80/1.43**	**12.5**	●
		P.M.	**F**	**>80/1.18**	**F**	**>80/1.53**	**10.0**	●
		Sun	D	44.0	**E**	**58.8/0.87**	**--**	● PI
#1006	Third St/Palou Ave	A.M.	D	54.9	**F**	**>80/1.91**	**--**	● PI
		P.M.	**F**	**>80/1.51**	**F**	**>80/5.99**	**10.5**	●
		Sun	**E**	**75.5/0.67**	**F**	**>80/4.03**	**16.6**	●

Table 4.1.3-1. Intersection LOS – 2030 Baseline and Alternative 1 Conditions

Intersection		*Peak Hour*	*2030 Baseline*		*Alternative 1*			
			LOS[a]	**Delay/ v/c** [b]	**LOS**	**Delay/ v/c**	**Percent**[c]	**Impact**
#1008	Third St/Carroll Ave	A.M.	B	11.0	C	23.1	--	○
		P.M.	B	13.4	**E**	**74.8/0.93**	--	● PI
		Sun	B	10.2	**E**	**55.1/0.66**	**--**	● PI
#1009	Third St/Paul Ave/Gilman Ave	A.M.	**F**	**>80/1.15**	**F**	**>80/2.00**	4.5	○ NSC
		P.M.	**F**	**>80/1.27**	**F**	**>80/3.36**	4.1	○ NSC
		Sun	**E**	**62.8/0.71**	**F**	**>80/1.89**	**6.1**	●
#1016	Evans Ave/Cesar Chavez St	A.M.	**F**	**>80/1.85**	**F**	**>80/1.91**	**6.6**	●
		P.M.	**F**	**>80/1.78**	**F**	**>80/1.84**	**5.4**	●
		Sun	B	16.9	B	19.1	--	○
#1048	Jennings St/Middle Point Rd/Evans Ave	A.M.	**C**	**>80/22.9**	C	27.7	--	○
		P.M.	**C**	**>80/29.1**	C	31.5	--	○
		Sun	B	19.7	B	19.9	--	○
#1058	Evans Ave/Napoleon St/Toland St	A.M.	**F**	**>80/1.12**	**F**	**>80/1.50**	**6.9**	●
		P.M.	**F**	**>80/1.48**	**F**	**>80/1.61**	**5.4**	●
		Sun	**E**	**57.3/0.48**	**E**	**59.9/0.57**	**9.2**	●
Hunters Point Shipyard Streets								
#110	Innes Ave/Donahue St	A.M.	B	14.5	A	9.6	--	○
		P.M.	B	14.7	A	8.0	--	○
		Sun	B	15.2	A	9.0	--	○
#111	Donahue St/Galvez Ave	A.M.	A	8.7	C	15.8	--	○
		P.M.	A	8.8	C	18.1	--	○
		Sun	A	8.7	B	11.9	--	○
#112	Donahue St/Lockwood St	A.M.	A	8.5	A	9.2	--	○
		P.M.	A	8.5	A	9.5	--	○
		Sun	A	8.5	A	8.9	--	○
#113	Crisp Rd/I St (Outer Ring Rd)	A.M.			C	16.8	--	○
		P.M.		Proposed Intersection	C	15.9	--	○
		Sun			C	20.9	--	○
#114	Crisp Rd/Spear St (Inner Ring Rd)	A.M.	A	7.4	C	15.7	--	○
		P.M.	A	7.4	C	15.3	--	○
		Sun	A	7.4	C	16.8	--	○
#115	Robinson St/Spear Ave	A.M.			**F (SBL)**	**>50/0.66**	**--**	⦿ PI
		P.M.		Proposed Intersection	**F (SBL)**	**>50/1.24**	**--**	⦿ PI
		Sun			C	17.0	--	○
#116	Lockwood St/Spear Ave	A.M.	A	8.4	C	16.9	--	○
		P.M.	A	8.5	B	14.6	--	○
		Sun	A	8.4	A	9.4	--	○

Notes:

LOS – level of service; v/c – volume-to-capacity; A.M. – A.M. Peak; P.M. – P.M. peak; Sun – Sunday Peak; NBL – northbound left turn; SBL – southbound left turn; EBL – eastbound left turn; WBL – westbound left turn; NSC – no significant contribution; PI – project impact.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

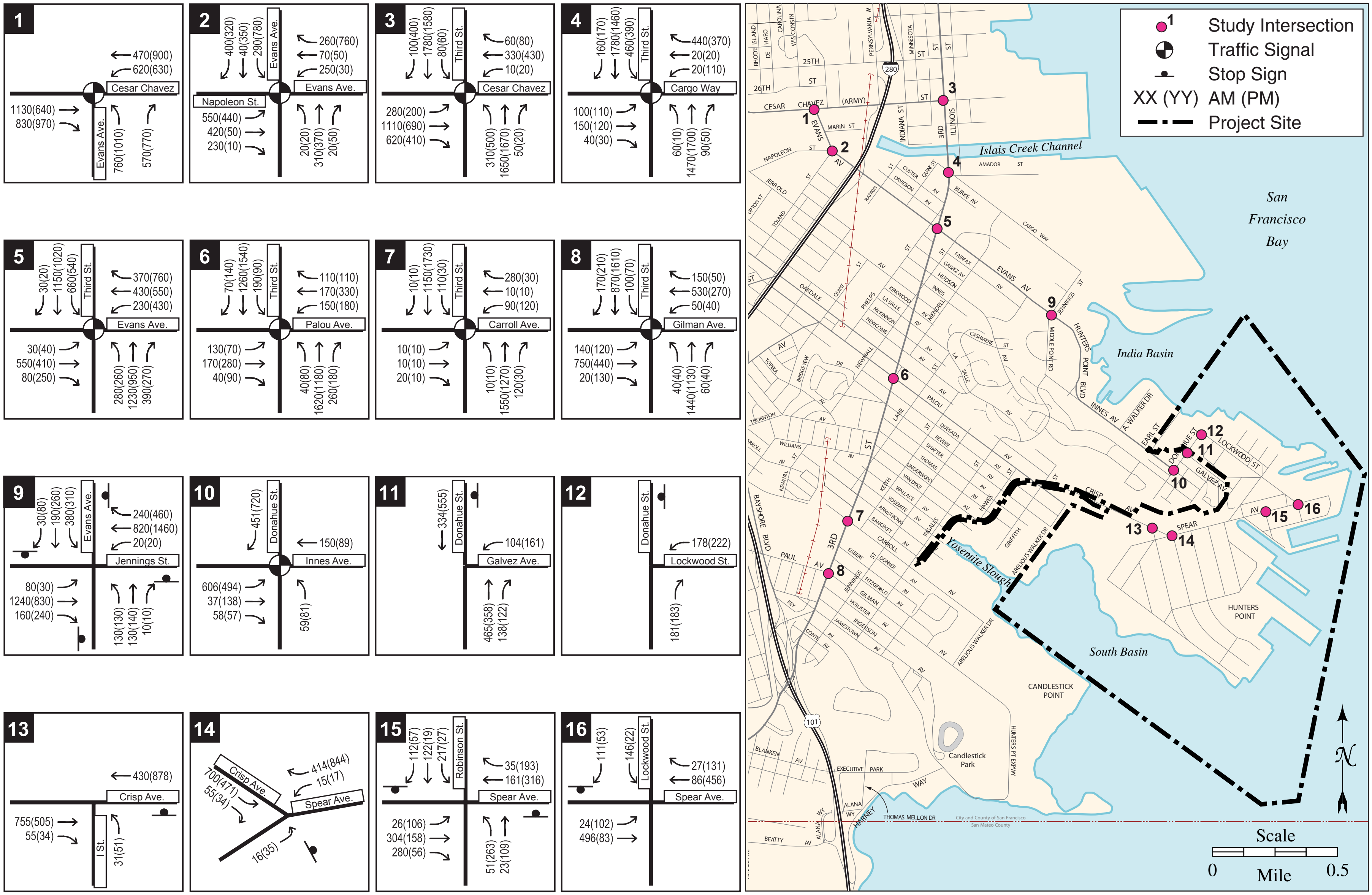
a. Intersections operating at LOS E or LOS F conditions highlighted in bold.

b. Delay in seconds per vehicle and overall intersection volume-to-capacity (v/c) ratio is presented where intersections operating at LOS E or LOS F conditions. For side street STOP-controlled intersections, delay and LOS presented for worst approach.

c. Percent contribution of project traffic.

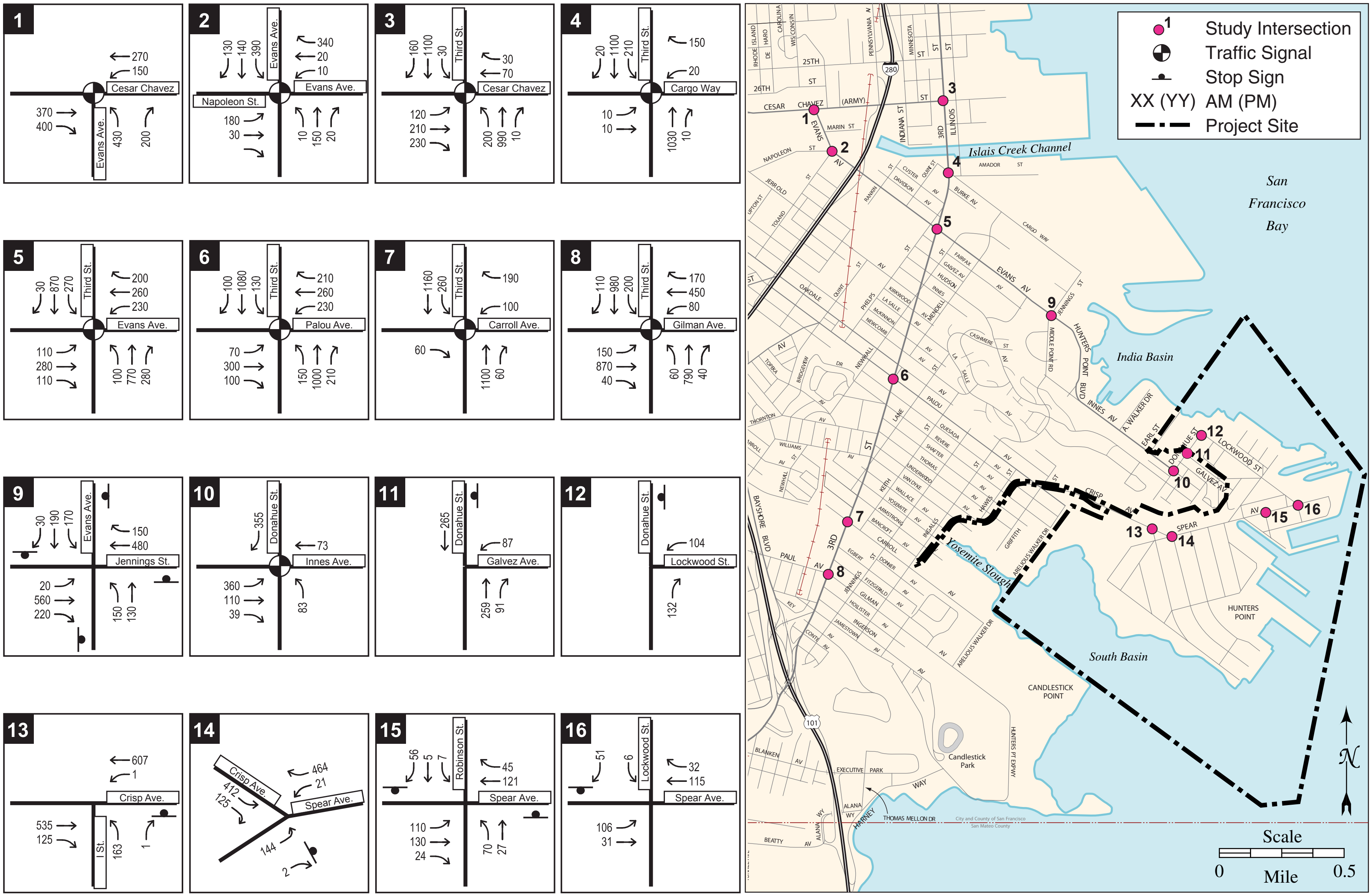
d. Significant cumulative and project impacts are presented, and the project impact is distinguished by using the "PI" designation.

Sources: CHS Consulting Group, *et al*. 2010; CHS Consulting Group, *et al*. 2009.



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.3-1. Weekday A.M. and P.M. Peak Hour Traffic Volumes - Alternative 1



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.3-2. Sunday P.M. Peak Hour Traffic Volumes - Alternative 1

INTERSECTIONS WITH NOT SIGNIFICANT IMPACTS

The following intersections are expected to operate at acceptable levels of service with Alternative 1; therefore, the impact would be *not significant* and no mitigation is proposed.

#1048 Jennings St/Middle Point Rd/Evans Ave;

#110 Innes Ave/Donahue St;

#111 Donahue St/Galvez Ave;

#112 Donahue St/Lockwood St;

#113 Crisp Rd/I St (Outer Ring Rd);

#114 Crisp Rd/Spear St (Inner Ring Rd); and

#116 Lockwood St/Spear Ave.

INTERSECTIONS WITH PROJECT AND CUMULATIVE TRAFFIC IMPACTS

The results show that the following study intersections are projected to operate at unacceptable levels with Alternative 1 and would result in project-specific impacts or would contribute to significant cumulative impacts during at least one peak hour.

#1002 Third St/Cesar Chavez St – project and cumulative *(significant and unavoidable);*

#1003 Third St/Cargo Way – project and cumulative *(significant and unavoidable);*

#1004 Third St/Evans Ave – project and cumulative (*significant and unavoidable);*

#1006 Third St/Palou Ave – project and cumulative (*significant and unavoidable);*

#1008 Third St/Carroll Ave – project-specific *(significant and unavoidable);*

#1009 Third St/Paul Ave/Gilman Ave – project and cumulative (*significant and unavoidable);*

#1016 Evans Ave/Cesar Chavez St – project and cumulative (*significant and unavoidable);*

#1058 Evans Ave/Napoleon St/Toland St – project and cumulative (*significant and unavoidable)*; and

#115 Robinson St/Spear Ave – project-specific *(significant and mitigable).*

At intersections that would operate at LOS E or LOS F under 2030 baseline conditions and would continue to operate at LOS E or LOS F under 2030 cumulative conditions, the project trips were reviewed to determine whether the increase would contribute considerably (greater than five percent) to critical movements operating at LOS E or LOS F. The increase in vehicle trips from 2030 baseline conditions caused by the Alternative 1 was determined to be significant and no feasible mitigation measures were identified for intersections described as "project and cumulative *(significant and unavoidable)*" in the list above.

The degradation in LOS would primarily be due to project traffic increases along Third St, Evans Ave, and major east/west streets serving project traffic (e.g., Carroll Ave, Gilman Ave). Improvements along Third St are limited due to right-of-way constraints associated with the Third St light rail, and traffic signals on intersections along Third St are timed to prioritize transit movements along Third St. The SFMTA has indicated that there may be slight adjustments to the traffic signal timing for intersections along Third St 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 St and Evans Ave would need to be widened. 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. Widening Third St or Evans Ave or reducing the corner sidewalk space would be inconsistent with the pedestrian environment created by the Third St Light Rail Project. Widening of Third St or Evans Ave would make the pedestrian crossings at the intersection longer and would require more dedicated pedestrian crossing time as part of the signal phasing plan. Due to the issues related to acquisition of additional right-of-way, mitigation was determined to be infeasible. Therefore, the proposed action‘s traffic impacts and the proposed action‘s contribution to cumulative impacts at these study intersections would be *significant and unavoidable*.

Under Alternative 1, Third St/Carroll Ave would result in project-specific impacts, as seen in Table 4.1.3-1. The degradation in LOS would primarily be due to project-related traffic increases along Third St, Cesar Chavez St, and Carroll Ave. For the reasons discussed above, traffic impacts at these intersections could not feasibly be mitigated under Alternative 1 and project impacts would *remain significant and unavoidable*.

The intersection of Robinson St/Spear Ave (#115) is proposed as a side street STOP sign controlled intersection, with movements along Spear Ave uncontrolled and movements on Robinson St controlled by a STOP sign. With Alternative 1, operating conditions would degrade from an acceptable LOS to LOS F during the weekday A.M. and P.M. peak periods and traffic signal warrants would be met. The poor level of service is primarily due to the delay experienced by the stop-controlled movements on the Robinson St approaches. Implementation of **Mitigation 3** (below) would minimize Alternative 1 transportation impacts. Therefore, traffic impacts at the intersection of Robinson St/Spear Ave would be *not significant with mitigation*.

Mitigation Measure

Mitigation 3. Install a traffic signal at the intersection of Robinson St/Spear Ave.

Installation of a traffic signal at the intersection of Robinson St/Spear Ave 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 build-out of Alternative 1. The future developer or owner of the property, in collaboration with the city, would monitor traffic volumes at completion of each phase of construction to determine whether the intersection volumes would actually warrant a traffic signal and when it would be implemented. Based on the monitoring, if the city determines a traffic signal is warranted, the future developer or owner of the property would be required to fund installation of a traffic signal as part of later development phases. The SFMTA and DPW would design and implement the measure as necessary. The City and County of San Francisco and SFMTA would be responsible for enforcement of the mitigation, and the City and County of San Francisco, SFMTA, and the Planning Department would be responsible for the compliance monitoring. The monitoring program would be completed upon installation of the traffic signal.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation intersection impacts associated with Factor 2 would not be different for this variant.

FREEWAY TRAFFIC IMPACTS

Table 4.1.3-2 presents the results of the mainline LOS analysis and summarizes the mainline segment impacts for 2030 baseline and Alternative 1 conditions. In some cases, the mainline segments operate at acceptable levels with the addition of project traffic during a specific peak periods. The increase in traffic due to Alternative 1 would result in increases in traffic volumes on the freeway segments that would cause the operations on all the study area freeway segments to deteriorate from the already LOS F conditions. At locations that would operate at LOS E or LOS F under 2030 baseline conditions, and would continue to operate at LOS E or LOS F under 2030 cumulative conditions, the project trips, as a percentage of total traffic volumes on the facility, were reviewed to determine whether the increase would contribute considerably (greater than five percent) to total volumes on the facility. The percent contribution of Alternative 1 traffic at all ramps is not considered significant and does not significantly contribute to the traffic impacts. Because impacts would be *not significant*, no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic. Therefore, transportation impacts would not be different for this variant.

Table 4.1.3-2. Mainline Segment LOS and Segment Impacts – 2030 Baseline and Alternative 1 Conditions

Ramp Location	*Peak*	*2030 Baseline*		*Alternative 1*			
		LOS	**Density [a]**	**LOS**	**Density**	**Percent[b]**	**Impact**
US-101, the SF County Line NB	A.M.	**F**	**>45**	**F**	**>45**	1.6	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0.9	○ NSC
	Sun	D	30.3	D	32.3	--	○
US-101, the SF County Line SB	A.M.	**F**	**>45**	**F**	**>45**	0.7	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.3	○ NSC
	Sun	D	31.8	D	34.3	--	○
SF/Oakland Bay Bridge EB	A.M.	**F**	**>45**	**F**	**>45**	1.2	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	2.2	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	1.2	○ NSC
SF/Oakland Bay Bridge WB	A.M.	**F**	**>45**	**F**	**>45**	1.0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0.7	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	0.6	○ NSC
I-280, south of US-101 NB	A.M.	**F**	**>45**	**F**	**>45**	0.8	○ NSC
	P.M.	D	33.2	D	33.3	--	○
	Sun	C	21.6	C	21.6	--	○
I-280, south of US-101 SB	A.M.	D	34.4	D	34.6	--	○
	P.M.	**F**	**>45**	**F**	**>45**	0.8	○ NSC
	Sun	D	29.5	D	29.5	--	○

Notes:
SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution.
● - Significant and unavoidable (no feasible mitigation)
⦿ - Significant and mitigable (not significant with mitigation)
○ - Not significant
a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.
b. Percent contribution of project traffic.
Source: CHS Consulting Group, *et al*. 2010.

FREEWAY RAMP IMPACTS

Table 4.1.3-3 presents the results of the ramp junction merge (on-ramp) and diverge (off-ramp) analysis and summarizes the impacts for 2030 baseline and Alternative 1 conditions. Alternative 1 would cause the ramp junctions to deteriorate from acceptable LOS D or better to LOS E or F conditions; or from LOS E to LOS F conditions and contribute cumulatively significant traffic increase resulting in significant traffic impacts at these locations:

- US-101 northbound off-ramp to Third St/Bayshore Blvd;
- US-101 northbound on-ramp from Bayshore Blvd/Cesar Chavez St;

- US-101 southbound off-ramp to Cesar Chavez St;
- US-101 southbound on-ramp from Bayshore Blvd/Third St;
- I-280 northbound on-ramp from Indiana St; and
- I-280 southbound off-ramp to Pennsylvania Ave.

Table 4.1.3-3. Ramp Junction LOS and Impacts – 2030 Baseline and Alternative 1 Conditions

Ramp Location	*Peak Hour*	*2030 Baseline*		*Alternative 1*			
		LOS	**Density[a]**	**LOS**	**Density**	**Percent[b]**	**Impact**
US-101 NB Off to Third St/Bayshore Blvd	A.M.	D	31.3	D	32.6	--	○
	P.M.	**E**	**35.5**	**E**	**37.3**	**8.6**	●
	Sun	C	22.8	C	24.0	--	○
US-101 NB On from Third St/Bayshore Blvd	A.M.	C	22.3	C	23.6	--	○
	P.M.	C	27.9	D	30.0	--	○
	Sun	C	21.9	C	22.4	--	○
US-101 NB Off to Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	2.3	○ NSC
	P.M.	**E**	**39.4**	**E**	**40.7**	0.4	○ NSC
	Sun	D	29.7	D	30.5	--	○
US-101 NB On from Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	2.1	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	**6.1**	●
	Sun	D	31.4	**F**	**>45**	**5.2**	●
US-101 SB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	4.9	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	4.8	○NSC
	Sun	**F**	**>45**	**F**	**>45**	4.5	○NSC
US-101 SB Off to Bayshore Blvd/Third St	A.M.	**E**	**34.7**	**E**	**41.4**	0	○ NSC
	P.M.	**E**	**31.2**	**E**	**37.3**	0	○ NSC
	Sun	C	22.4	C	25.0	--	○
US-101 SB On from Bayshore Blvd/Third St	A.M.	**F**	**>45**	**F**	**>45**	**8.1**	●
	P.M.	**F**	**>45**	**F**	**>45**	**10.7**	●
	Sun	C	23.7	C	26.0	--	○
I-280 NB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	Sun	C	26.0	C	26.0	--	○
I-280 NB On from Indiana St	A.M.	**F**	**>45**	**F**	**>45**	**7.9**	●
	P.M.	**F**	**>45**	**F**	**>45**	**13.9**	●
	Sun	C	25.2	C	25.8	--	○
I-280 SB Off to Pennsylvania Ave	A.M.	**E**	**36.3**	**E**	**36.9**	**16.8**	●
	P.M.	**F**	**>45**	**F**	**>45**	**8.0**	●
	Sun	D	30.6	D	30.9	--	○

Notes:
SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution.
● - Significant and unavoidable (no feasible mitigation)
⦿ - Significant and mitigable (not significant with mitigation)
○ - Not significant
a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.
b. Percent contribution of project traffic.
Source: CHS Consulting Group, *et al*. 2010.

Providing additional on-ramp lanes would increase the capacity of on-ramp. Therefore, more traffic would enter the freeway mainline segment and may exacerbate the poor merging conditions. Widening US-101 and I-280 to provide additional capacity would not be feasible; thus, mitigation of these impacts has been determined to be infeasible. No feasible mitigation measures have been identified for the off-ramp locations for similar reasons. Based on the reasons above, no feasible mitigation measures were identified; therefore, traffic impacts at the freeway ramp junctions under Alternative 1 would *remain significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic. Therefore, transportation impacts associated with Factor 2 and freeway ramp impacts would not be different for this variant.

4.1.3.2.3 Factor 3: Transit Impacts

This section describes the impacts to transit associated with the project alternatives. Two transit analyses were conducted: 1) the impact of the additional transit travel demand generated by the project alternatives on the capacity utilization of the study area cordons (see Figure 4.1.3-3), the downtown Muni screenlines (see Figure 4.1.3-4), and the regional screenlines (see Figure 4.1.3-5); and, 2) the impact of the additional vehicle and transit travel demand on transit travel times for the Muni routes traveling within the study area. Since both the HPS and Candlestick Point projects would be constructed by the same Project Sponsor and construction of both projects would begin concurrently, transit improvements would be phased in to serve both projects and cannot be separated. Therefore, the transit impact analyses were performed as combined cumulative analyses for both projects, and there is no separate calculation of the contribution of the impacts by the proposed action alone. This approach is appropriate because any future transit delay would be caused by delay at intersections in the project vicinity and the intersection delay would be the results of both the proposed action and development at Candlestick Point.

Transit Capacity Utilization Analysis Methodology

The impact of additional transit ridership generated by the cumulative development was assessed by comparing the projected ridership to the projected available transit capacity. Transit capacity utilization refers to transit riders as a percentage of the capacity of a transit line, or group of lines combined and analyzed as cordons or screenlines across which the transit lines travel in accordance with standard practice for the City of San Francisco. The transit capacity utilization analysis was conducted for three conditions:

- At three cordons in the project vicinity to identify the localized impacts of proposed action transit trips on Muni routes;
- At the four downtown screenlines used to assess impacts on transit service between downtown and the rest of the city. The downtown screenline analysis is conducted at the maximum load point (i.e., the point of greatest demand) for most transit lines traveling into and out of downtown; and
- At the three regional screenlines to determine impacts on regional service providers.

Muni. The number of A.M. and P.M. peak hour riders was obtained from Muni monitoring data (Appendix D of the CP-HPS DEIR [SFRA 2009]) for existing conditions and adjusted for 2030 baseline conditions using the SF-CHAMP travel demand model. The service capacity of each line was estimated by multiplying the passenger capacity of each transit vehicle by the number of actual trips that occurred when the ridership data were collected. The capacity includes seated passengers and an appreciable number of standing passengers per vehicle (the number of standing passengers is between

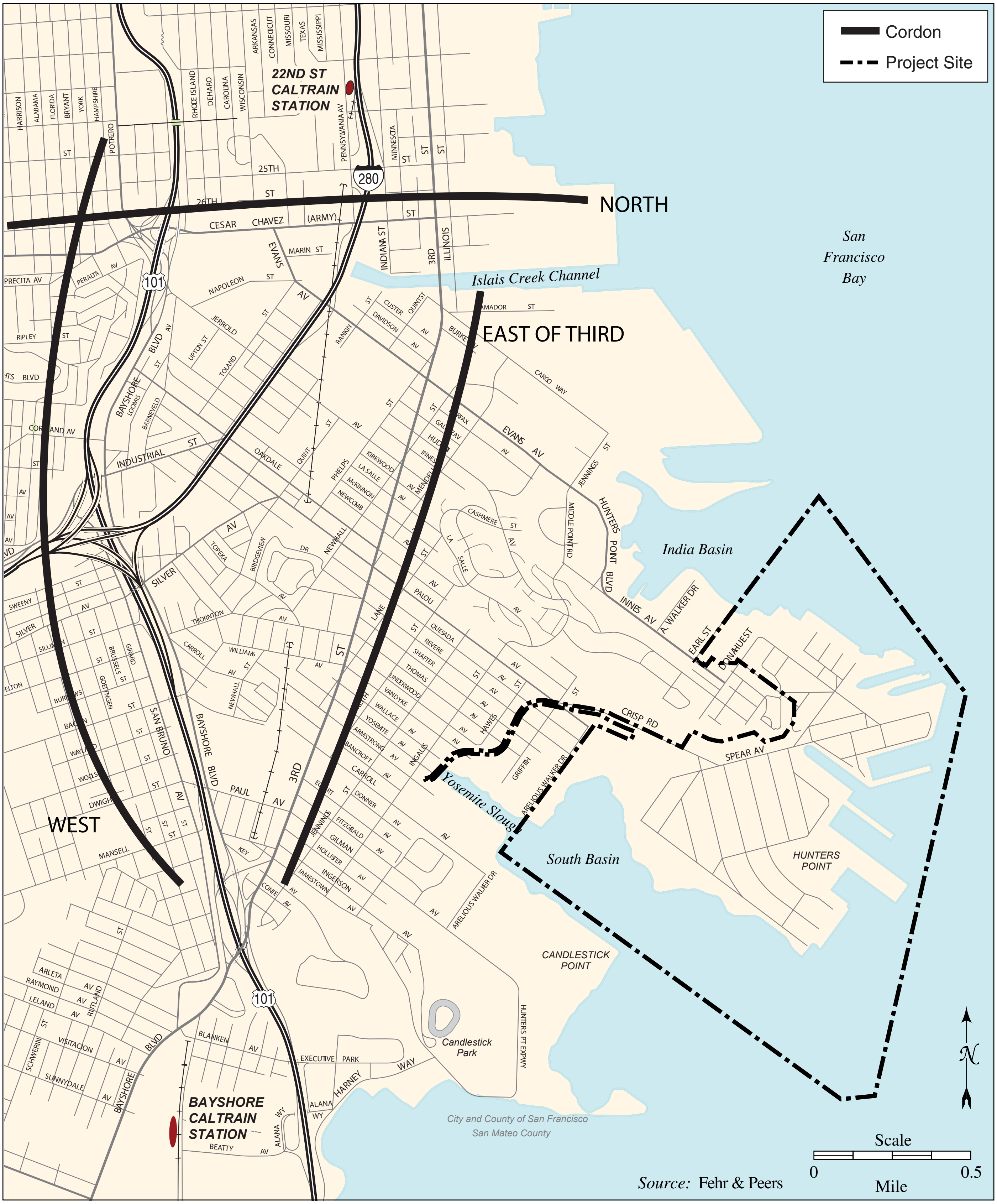


Figure 4.1.3-3. Study Area Muni Analysis Cordons

Source: SF Transportation Impact Analysis Guildlines

Figure 4.1.3-4. Muni Downtown Screenlines

Source: SF Transportation Impact Analysis Guildlines

Figure 4.1.3-5. Regional Tranist Screenlines

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-ft (9 m) bus, 63 passengers for a 40-ft (12 m) bus, 94 passengers for a 60-ft (18 m)bus, and 119 passengers for a light-rail vehicle (SF Guideline 2002). The percent utilization of capacity was then calculated by comparing the ridership demand to the capacity provided. Muni has established a capacity utilization standard of 85 percent.

The Muni capacity utilization analysis was conducted at three cordons at the perimeter of the study area. The three cordons and the Muni lines included in each analysis cordon are:

- North cordon at Cesar Chavez St: T-Third St, 9-San Bruno, 19-Polk lines;
- West cordon located west of US-101: 23-Monterey, 24-Divisadero, 29-Sunset, 44-O'Shaughnessy, 26-Quintara-24th St, 54-Felton lines; and
- East of Third St: 19-Polk, 23-Monterey, 29-Sunset, 44-O'Shaughnessy, 54-Felton lines.

The East of Third St cordon was analyzed to assess the degree to which transit demand between the project site and the T-Third St light rail service would affect localized transit capacity.

Downtown screenlines examine the overall utilization of Muni transit capacity into and out of downtown San Francisco from the northeast, northwest, southeast, and southwest of San Francisco. The downtown screenline analysis is included in the SF Guidelines and has been recently updated to 2030 conditions as part of the analysis of the Planning Department‘s downtown Transit District Center project.

Regional Service Providers. Regional transit service was evaluated at the screenline level 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). 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 is standees (i.e., 1.15 passengers per seat). The regional screenline analysis is included in the SF Guidelines, and has been recently updated to 2030 conditions as part of the analysis of the Planning Department‘s downtown Transit District Center project.

Final Transit Plan

The proposed Transit Plan for the CP-HPS Development Plan proposes substantial transit improvements to serve both the proposed action and the Candlestick Point project beyond the future 2030 baseline conditions as presented in Section 4.1.1.2.3. However, because the final Transit Plan has not been formally approved by SFMTA, **Mitigation 4** requires the future developer or owner of the property to prepare a Transit Plan and seek approval from the SFMTA for implementing the final Plan. With implementation of the final Transit Plan, transit services to HPS would be increased and thus project-generated transit trips would be accommodated as shown in Table 4.1.3-4; therefore, project impacts on transit capacity would be *not significant with mitigation*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

MITIGATION MEASURE

Mitigation 4. Develop and implement the final Transit Plan.

The future developer or owner of the property would work with SFMTA to develop and implement the final Transit Plan for the proposed action. Elements of the final Transit Plan would include:

- Extension of the 24-Divisadero, the 44-O'Shaughnessy, and the 48-Quintara-24th St into the proposed Hunters Point Transit Center;
- Increased frequency on the 24-Divisadero to 6 minutes in the A.M. and P.M. peak periods. Extension of the 29-Sunset from its current terminus near the Alice Griffith housing development, near Gilman Ave and Giants Dr, 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 A.M. and P.M. 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 Dr and Pershing Dr in the Presidio) at ten-minute headways;
- Convert T-Third St 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 Ave Limited from its TEP-proposed terminus on Geneva Ave, just east of Mission St, into the Hunters Point Transit Center. The 28L-19th Ave Limited would travel along Geneva Ave across US-101 via the proposed Geneva Ave extension and new interchange with US-101, to Harney Way. East of Bayshore Blvd, the 28L-19th Ave 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 Transit Center;
- The 28L-19th Ave Limited would operate a short line to the Balboa Park BART station. This would increase frequencies on the 28L-19th Ave Limited by reducing headways between buses from ten minutes to five minutes for the segment between HPS and the Balboa Park BART station. Every other bus would continue to the Sunset District (to the proposed terminus at North Point St and Van Ness Ave) at ten-minute headways. If the TEP-proposed extension of the 28L has not been implemented by the SFMTA by the time implementation of this measure is called for, the future developer or owner of the property would fund the extension of that line between its existing terminus and Bayshore Blvd;
- New CPX-Candlestick Express to downtown serving the Candlestick Point site, traveling along Harney Way (with potential stops at Executive Park), before traveling on US-101 toward downtown, terminating at the Transbay Terminal; and
- New HPX-Hunters Point Shipyard Express to downtown serving the HPS site, traveling from the Hunters Point Transit Center, along Innes Ave, with stops at the India Basin and Hunters View areas, before continuing along Evans Ave to Third St, eventually entering I-280 northbound at 25th St/Indiana St. The HPX would continue non-stop to the Transbay Terminal in Downtown San Francisco.

Implementation and funding of this mitigation identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the future developer or owner of the property and SFMTA. The mitigation would need to be submitted as part of the DDA prior to project approval. The City and County of San Francisco and SFMTA would be responsible for the enforcement of the mitigation and compliance monitoring. The mitigation would be approved as part of the DDA.

Ridership and Capacity Utilization at Study Area Cordons

Full implementation of the cumulative developments' transit improvements would result in substantial increases in capacity for both the north/south and east/west lines serving the project vicinity as shown in Table 4.1.3-4. It shows that the 2030 cumulative condition would more than double overall east-west transit capacity at the cordon just east of Third St (primarily due to the extension of the 28L-19th Ave/Geneva Limited BRT route into HPS). North-south transit capacity to the north of the project site would double and capacity to the south would increase by over 80 percent over the transit service proposed by the TEP. In terms of capacity utilization, these proposed improvements under the future 2030 cumulative conditions would not only provide ample capacity at the study area cordons to accommodate transit ridership generated by both the proposed action and Candlestick Point project, but also substantially improve capacity utilization at study area cordons under the 2030 baseline conditions (Table 4.1.3-5).

Table 4.1.3-4. Comparison of Capacity at Study Area Cordons Existing, 2030 Baseline and Cumulative Conditions – Weekday A.M. and P.M. Peak Hours

Cordon	Existing Capacity [1]	2030 Baseline TEP Capacity [2]	2030 Cumulative Capacity [3]
East of Third St 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 are presented in Appendix L, Transportation, Traffic, and Circulation Resource Data.
3. 2030 baseline 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 St, and the 56-Rutland will be eliminated.
4. Cumulative conditions reflect TEP, plus the following improvements (SFRA 2009):

a. 24-Divisadero would be extended from its terminus at Third St/Palou Ave, along Palou Ave and Crisp Rd into the Hunters Point 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 Ave, just east of Mission St, along Geneva Ave and Harney Way, across the proposed Yosemite Slough bridge, and into the Hunters Point 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 Ave/Giants Dr 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 Ave/Mendell into the Hunters Point Transit Center. Headways would remain at 6 minutes, similar to the TEP scenario.
e. 48-Quintara-24th St would be rerouted from its current terminus near 22nd St/Third St to serve the project vicinity as part of the TEP (replacing the 19-Polk, which would no longer serve the HPS site). With the proposed action, 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 US-101 toward downtown, terminating at the Transbay Terminal.
g. HPX- HPS Express to downtown would be a new express bus route serving the HPS site, traveling from the Hunters Point Transit Center, along Innes Ave, with stops at the India Basin and Hunters View areas, before continuing along Evans Ave to Third St, eventually entering I- 280 northbound at 25th St/Indiana St. The HPX would continue non-stop to the Transbay Terminal in Downtown San Francisco.
h. T-Third St 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 St would remain unchanged.

Source: SFMTA, Fehr & Peers 2009.

Table 4.1.3-5. Transit Trips and Capacity Utilization at Study Area Cordons Existing, 2030 Baseline and Cumulative Conditions – Weekday A.M. and P.M. Peak Hours						
Cordon	***Existing***		***2030 Baseline***		***2030 Cumulative***	
	Ridership	**Capacity Utilization (Percent)**	**Ridership**	**Capacity Utilization (Percent)**	**Ridership**	**Capacity Utilization (Percent)**
A.M. PEAK HOUR						
East of Third St Cordon						
Inbound	686	40	1,353	79	2,547	64
Outbound	319	19	1,577	92	1,541	39
North Cordon						
Inbound	859	41	2,065	**117**	2,458	69
Outbound	754	36	1,901	**107**	2,151	61
West Cordon						
Inbound	1,348	68	2,053	92	3,163	79
Outbound	722	36	1,536	69	1,870	47
P.M. PEAK HOUR						
East of Third St Cordon						
Inbound	389	23	1,382	81	2,002	50
Outbound	253	15	848	49	2,091	52
North Cordon						
Inbound	846	41	2,049	**116**	2,675	75
Outbound	626	30	1,628	92	2,231	63
West Cordon						
Inbound	711	36	1,196	54	1,937	48
Outbound	824	42	1,249	56	2,374	59
Source: CHS Consulting Group, *et al*. 2010.						

If project-related transit capacity improvements are not provided, then only the capacity presented in Table 4.1.3-5 for the 2030 baseline conditions would be available to accommodate cumulative transit ridership. As indicated in Table 4.1.3-5, under 2030 baseline 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, **Mitigation 4** (described previously) is proposed so that the final Transit Plan would be prepared and implemented.

Transit Capacity Utilization at Downtown Screenlines

Project transit impacts are also assessed at the Downtown Screenlines where transit lines serving the proposed action and Candlestick Point development has the highest capacity utilization. The analyses, as presented in Table 4.1.3-6, shows that the proposed action and Candlestick Point projects would not degrade the capacity utilization at the four downtown screenlines to below Muni's 85 percent capacity utilization standard during both A.M. and P.M. peak hours. It should be noted that the proposed action and Candlestick Point projects would only add peak-direction riders through the southeast downtown screenline. Ridership on other screenlines would remain unchanged from 2030 baseline conditions. Therefore, impacts on transit capacity utilization at the downtown screenlines would be *not significant*. No mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 3 would not be different for this variant.

Table 4.1.3-6. Transit Trips and Capacity Utilization at Downtown Screenlines Existing, 2030 Baseline and Cumulative Conditions – Weekday A.M. and P.M. Peak Hours						
Downtown Screenline	***Existing***		***2030 Baseline***		***2030 Cumulative***	
	Ridership	**Capacity Utilization (Percent)**	**Ridership**	**Capacity Utilization (Percent)**	**Ridership**	**Capacity Utilization (Percent)**
A.M. Peak Hour						
Northeast	1,882	50	3,008	78	3,008	78
Northwest	7,434	65	8,949	75	8,949	75
Southeast	4,248	67	7,248	71	7,536	74
Southwest	6,627	76	7,674	76	7,674	76
Total All Screenlines	***20,191***	***67***	***26,879***	***74***	***27,167***	***75***
P.M. Peak Hour						
Northeast	1,886	52	3,140	67	3,140	78
Northwest	6,621	65	8,155	70	8,155	75
Southeast	4,668	66	7,733	78	8,263	83
Southwest	7,434	77	8,829	82	8,829	82
Total All Screenlines	***20,609***	***68***	***27,857***	***75***	***28,347***	***80***
Source: CHS Consulting Group, *et al*. 2009.						

Transit Capacity and Utilization at Regional Screenlines

Cumulative transit improvements in the project vicinity would not affect the capacity of the regional carriers at regional screenlines. Table 4.1.3-7 summarizes the capacity utilization for the regional transit provider screenlines for the A.M. and P.M. peak hours for existing, 2030 baseline, and 2030 cumulative conditions. Both the proposed action and the Candlestick Point projects would contribute small ridership increases to regional transit, with the greatest increase to and from the South Bay. These two projects would contribute slightly fewer trips to the South Bay in the off-peak directions (southbound in the A.M. peak hour and northbound in the P.M. peak hour) than in the peak directions. Off-peak direction ridership would remain within available capacity in the A.M. and P.M. peak hours.

BART to the East Bay and Golden Gate Transit to the North Bay are projected to exceed operating standards under 2030 baseline conditions during both the weekday A.M. and P.M. peak hours. Study area contributions to these screenlines would be minimal (fewer than 50 transit riders). Therefore, the cumulative impacts and the proposed action's contribution to cumulative impacts on regional transit capacity would be *not significant*. No mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 3 would not be different for this variant.

Transit Operations Impacts

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:

- **Traffic congestion delay.** Traffic congestion associated with increases in area traffic slows down transit vehicles and results in increased transit travel times;
- **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; and

Table 4.1.3-7. Transit Trips and Capacity Utilization at Regional Screenlines Existing, 2030 Baseline and Cumulative Conditions – Weekday A.M. and P.M. Peak Hours

Regional Screenline and Transit Mode	*Existing*		*2030 Baseline*		*2030 Cumulative*		
	Ridership	**Capacity Utilization (Percent)**	**Ridership**	**Capacity Utilization (Percent)**	**Ridership**	**Capacity Utilization (Percent)**	**> 50 Riders[a]**
A.M. PEAK HOUR							
East Bay							
BART	18,064	**123**	36,202	**185**	36,202	**185**	No
AC Transit	1,670	55	3,347	61	3,347	61	--
Ferries	667	56	1,971	83	1,971	83	--
Subtotal	*20,401*	*108*	*41,520*	*151*	*41,520*	*151*	--
North Bay							
Golden Gate Transit	1,510	57	2,623	**106**	2,621	**106**	No
Ferries	949	56	1,647	97	1,647	97	--
Subtotal	*2,459*	*56*	*4,268*	*102*	*4,268*	*102*	--
South Bay							
BART	11,185	**105**	12,409	89	12,416	89	--
Caltrain	2,128	65	4,454	70	4,451	70	--
SamTrans	686	65	794	75	799	75	--
Ferries	—	--	152	51	152	51	--
Subtotal	*13,999*	*94*	*17,809*	*82*	*17,818*	*82*	--
Total All Screenlines	***36,859***	***96***	***63,597***	***119***	***63,606***	***119***	--
P.M. PEAK HOUR							
East Bay							
BART	16,985	**120**	30,241	**154**	30,268	**154**	No
AC Transit	2,517	60	4,485	68	4,485	68	--
Ferries	702	46	2,147	79	2,147	79	--
Subtotal	*20,204*	*102*	*36,873*	*128*	*36,900*	*128*	--
North Bay							
Golden Gate Transit	1,397	63	2,513	**114**	2,513	**114**	No
Ferries	906	53	1,630	96	1,630	96	--
Subtotal	*2,303*	*59*	*4,143*	*106*	*4,143*	*106*	--
South Bay							
BART	9,545	92	10,631	76	10,707	76	--
Caltrain	1,986	61	3,959	62	4,008	63	--
SamTrans	575	61	362	39	404	43	--
Ferries	—	—	75	25	75	25	--
Subtotal	*12,106*	*83*	*15,027*	*69*	*15,194*	*70*	--
Total All Screenlines	***34,613***	***90***	***56,043***	***103***	***56,237***	***103***	--

Note:

a. If capacity utilization is greater than 100 percent and ridership growth is greater than 50 transit riders per transit mode, the impact would be considered significant.

Source: CHS Consulting Group, *et al*. 2009.

- **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.

A detailed discussion of how each of these three delay components was calculated and a detailed breakdown of the calculations of increased delay associated with the cumulative developments are included in the CP-HPS Transportation Study (Appendix D of the CP-HPS DEIR [SFRA 2009]).

The combination of the proposed action and Candlestick Point project would cause a significant impact on transit operations, if the delay at intersections in the project vicinity under the future 2030 cumulative conditions would increase transit travel time such that additional transit vehicles would be required to maintain the proposed headways. This was assumed to be the case if either the 2030 travel time increases on a particular route to greater than half its proposed headway (increased travel time results directly in increased headways) or if the number of required vehicles estimated using SFMTA's cost/scheduling model, which takes into account schedule breaks and extra time built into schedules, increases by one or more vehicles with the addition of the project characteristics.

Table 4.1.3-8 presents the estimated total delays to each of the transit routes as the result of traffic congestion in the vicinity of HPS, but not within HPS, in 2030 with both the proposed action and Candlestick Point project,. Within the project site, the following routes would experience substantial delays (greater than half of the proposed headway) at intersections along each route: 9-San Bruno, 23-Monterey, 24-Divisidero and the 44-O'Shaughnessy, 48-Quintara-24th St, and T-Third St as presented in Table 4.1.3-8. The provision of transit-only lanes and other transit-priority treatments would reduce all three types of travel time delays and impacts.

Table 4.1.3-8. Cumulative Project Increases to Transit Travel Time (2030 Cumulative Condition)

Route	*Proposed Headway (min.)*	*Delay per Bus (min.)*
9-San Bruno	10	8
23-Monterey	15	7
24-Divisidero	6	7
44-O'Shaughnessy	10	7
48-Quintara-24th St	15	3
T-Third St	8	3

Source: Appendix D of the CP-HPS DEIR (SFRA 2009).

Mitigation Measures

Mitigations 5 and 6 would encourage a review of measures to improve selected transit routes and add additional transit capacity to minimize impacts.

Mitigation 5. Conduct, in cooperation with SFMTA, a study to evaluate the effectiveness and feasibility of the following improvements which could reduce project impacts on transit operations and implement feasible improvements.

Prior to issuance of a grading permit, the future developer or owner of the property in cooperation with SFMTA would conduct a study to evaluate the effectiveness and feasibility of the following improvements which could reduce project impacts on transit operations. The cost of the study would be shared by SFMTA and the future developer or owner of the property. The study would create a monitoring program to determine the implementation extent and schedule to maintain the proposed headways of the following transit lines (a detailed breakdown for each transit line is included in the CP-HPS Transportation Study (Appendix D of the CP-HPS DEIR [SFRA 2009]). If the SFMTA determines the feasibility and effectiveness of these recommended improvements, the SFMTA and the future developer or owner of the property would be responsible for the implementation of the following improvements:

- **9-San Bruno.** Install a transit-only lane on northbound San Bruno Ave for the one-block section (400 ft [120 m]) between Silliman St and Silver Ave; install a transit-only lane on southbound San Bruno Ave at the approach to Dwight St/Paul Ave; and install signal priority treatments at the intersection of San Bruno/Silver on westbound Silver Ave;
- **23-Monterey, 24-Divisidero and the 44-O'Shaughnessy.** Convert one of the two westbound travel lanes on Palou Ave between Keith St and Newhall St (three blocks) to a transit-only lane at all times;

convert one of the two eastbound travel lanes on Palou Ave between Newhall St and Third St (one block) to a transit-only lane at all times; reconfigure or remove the pedestrian corner bulbs on the northwest and southwest corners of the intersection of Palou Ave and Third St; and, during the P.M. peak period only, prohibit parking on westbound Palou Ave for the four-block segment between Griffith St/Crisp Rd and Keith St to provide for a P.M. peak period curb transit-only lane along this segment. As an alternative to the measures above, narrow the existing sidewalks on Palou Ave from Third St to Crisp Rd (seven blocks) from 15 to 12 ft (4.5 m to 3.6 m) in width and remove the pedestrian bulbouts (extensions of the sidewalk at intersections) on the west side of Third St;

- **29-Sunset.** Prohibit on-street parking on westbound Gilman Ave during the A.M. and P.M. peak periods to provide for three westbound travel lanes for the five-block segment of Gilman Ave between Arelious Walker Dr and Third St; for the same five-block segment, 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; prohibit on-street parking in the eastbound direction; and operate one of the two eastbound lanes as transit-only lanes. As an alternative to the two measures above, convert one of the travel lanes in each direction on Gilman Ave from Third St to Griffith St to transit-only. Prohibit on-street parking on the north side of Paul Ave, between Third St and Bayshore Blvd to create two westbound through lanes;
- **48-Quintara-24th St.** On Evans Ave, between Jennings St and Napoleon St (a nine-block segment – about 6,000 ft [560 m]), convert one of the two travel lanes in each direction to a transit-only lane at all times; and
- **T-Third St.** Reconfigure the section of Third St between Thomas Ave and Kirkwood Ave (nine 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.

The City and County of San Francisco and SFMTA would be responsible for the enforcement of the mitigation and compliance monitoring. This mitigation would be implemented upon completion of the monitoring program as directed and approved by the SFMTA.

Mitigation 6. Purchase additional transit vehicles as necessary to mitigate the project impacts and project contribution to cumulative impacts to headways.

Obtaining additional transit vehicles would help maintaining service headway. One option to mitigate transit operations impact would be to obtain additional Muni buses. Should **Mitigation 5** be determined infeasible or ineffective by the SFMTA, the future developer or owner of the property would work with SFMTA to purchase additional transit vehicles as necessary to mitigate the study area impacts and proposed action's contribution to cumulative impacts to headways based on the schedule and thresholds set forth in the feasibility study. The cost for this mitigation would be shared by the SFMTA and the future developer or owner of the property. The City and County of San Francisco and SFMTA would be responsible for the enforcement of the mitigation and compliance monitoring. The implementation of this mitigation would be completed when the purchase of additional transit vehicles is funded as determined by the feasibility study.

4.1.3.2.4 Factor 4: Bicycle Network and Circulation

Off-street Class I pathways would be provided around the bayside perimeter of Candlestick Point, across the proposed Yosemite Slough bridge, and onto Hunters Point Blvd via Crisp Rd. Within the project site, the Bay Trail would also be completed.

Alternative 1 includes a bicycle lane in both directions on Innes Ave between Donahue St and Hunters Point Blvd, which would require removal of on-street parking on the south side of Innes Ave between Earl St and Hunters Point Blvd. The proposed improvement is consistent with Option 1 in the *San*

Francisco Bicycle Plan; however, it would not preclude implementation of Option 2 (sharrows[12] added to the existing Class III facility), if that option were determined to be preferable by SFMTA.

Overall, with Alternative 1, the added bicycle lanes and bicycle parking presented above would accommodate the bicycling demand associated with the project uses that otherwise would not exist. Therefore, operational impacts of Alternative 1 associated with Factor 4 would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or affect bicycle access. Therefore, transportation impacts associated with Factor 4 would not be different for this variant.

4.1.3.2.5 Factor 5: Pedestrian Circulation

Pedestrian amenities in HPS would include crosswalks at unsignalized intersection, pedestrian crosswalks and signals at all new signalized intersections, corner bulbouts, and completion of the existing sidewalk network where it currently is incomplete. Sidewalk widths on new or improved streets within the project site would range from 10 to 15ft (3 to 4.5 m) in width, with the majority of streets having sidewalks 12 ft (3.6 m) or greater in width. The project would also include new sidewalks, and minor sidewalk narrowing on a number of existing streets within the project site to provide added street width for transit passage.

Overall, with Alternative 1, pedestrian access would improve over current conditions. Development of Alternative 1 would also increase pedestrian presence in the area. Therefore, impacts on pedestrian circulation associated with Factor 5 would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect pedestrian circulation. Therefore, transportation impacts associated with Factor 5 would not be different for this variant.

4.1.3.2.6 Factor 6: Emergency Access

Alternative 1 includes the construction of new roadways that would facilitate both general traffic and emergency vehicle access that would otherwise not exist as presented in Section 4.1.1.2.3. Existing emergency response routes would either be maintained in their existing locations or rerouted as necessary. 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), and emergency vehicles would be able to utilize transit lanes when streets are congested. Therefore, project impacts on emergency access associated with Factor 6 would be *not significant*. No mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

4.1.3.2.7 Factor 7: Loading Impacts

Under Alternative 1, the proposed action would generated a demand for approximately 41 loading spaces and would provide a total of 42 off-street loading spaces within the Hunters Point Shipyard. Overall within the HPS, the loading demand would be accommodated by the off-street loading spaces that would be provided by each individual building. The loading requirements for the proposed action were established in accordance with the HPS Redevelopment Plan and they include several thresholds for each type of land use. If the size of an individual building is below the threshold, then no off-street loading spaces would be required for that building. While the proposed action would provide a sufficient number of off-street loading spaces to meet the

[12] Sharrows are on-street bike lanes designated by symbols painted on the pavement to indicate bicycle use.

overall loading demand, it is likely that a small size building which is exempted from providing off-street loading spaces may require on-street curb space for truck loading, and the businesses in this building would petition the SFMTA for an on-street truck loading space. If the on-street loading spaces are not available when a delivery truck needs to make deliveries to the businesses in the small building, then these 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 limited temporary excess demand would not be a significant impact and no mitigation is required.

In addition to off-street facilities and on-street loading zones, approximately 300 ft (90 m) of curb space on the Stadium Outer Ring Rd within the project site would be designated for truck parking. The parking areas would have 17-foot (5-m) wide parking lanes that would fully accommodate wider trucks without impeding on adjacent bicycle or travel lanes. 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 BVHP.

Table 4.1.3-9 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. Within HPS, the loading demand and estimated supply would be similar. Impacts related to loading operations with Alternative 1 would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 7 would not be different for this variant.

Table 4.1.3-9. Summary of Project Loading Demand and Supply

Scenario/Project Site Area	***Daily Truck Generation***	***Peak Hour Loading Dock Space Demand***	***Supply [a, b]***
Hunters Point Shipyard	713	41	42

Notes:
a. Minimum number of loading spaces permitted per draft Design for Development standard for *CP-HPS Phase II Development Plan*.
b. Does not include stadium loading facilities.
Source: CHS Consulting Group, *et al*.2009 .

4.1.3.3 Stadium Football Game Impacts

This section describes the impacts associated with a new football stadium that would be located in HPS. A Sunday football game and a weekday secondary event were analyzed for the stadium.

4.1.3.3.1 Factor 2: Increase in Traffic Volumes from Stadium Football Games

With Alternative 1, the existing traffic management of pre-game and post-game traffic for the existing stadium would be adjusted to reflect the new stadium location and access routes. Alternative 1 includes 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. 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 Appendix L, Transportation, Traffic, and Circulation Resource Data.

Similar to existing conditions, the majority of stadium-bound traffic would use a portion of US-101 to access the project site on game days. Traffic from the south would predominantly use northbound US-101 and access the site via Harney Way, while traffic from the north would predominantly use southbound US-101 and I-280 and access the site via Cesar Chavez St, Cargo Way, Evans Ave, and Innes Ave. Some trips to the site would use Bayshore Blvd or Third St to access the area via Carroll Ave, Gilman Ave, and Ingalls St.

Prior to and after games at the proposed stadium, special measures (similar to those in place for existing football games at the existing stadium) as discussed below would be taken to allow the project vicinity's circulation system to accommodate unique game day traffic flows. Figure 4.1.3-6 (Stadium Game Day Ingress Routes) presents the pre-game circulation plan and Figure 4.1.3-7 (Stadium Game Day Egress Routes) present the post-game circulation plan. Prior to games, the roadways would be signed and channeled for inbound flow and after games the roadways would be signed and channeled for 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 US-101 and Arelious Walker Dr. Arelious Walker Dr, between Harney Way and Crisp Rd, would provide four inbound lanes. Crisp Rd would provide seven inbound lanes between Arelious Walker Dr 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 Rd, where they would be channeled to a Ring Rd on the southern portion of the stadium. Access to the internal parking aisles would be from the Ring Rd.

Vehicles accessing the new stadium from the north would use Evans Ave and Cargo Way. These inbound routes would merge at the intersection of Hunters Point Blvd/Jennings St/Evans Ave. From there, the inbound route along Hunters Point Blvd and Innes Ave would provide four inbound lanes and one outbound lane. The lane configurations along Hunters Point Blvd and Innes Ave 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 (e.g., large volume of vehicles arriving or leaving in a short period of time), including manual and dynamic control of intersections by traffic control officers and complex travel patterns, traditional methods of calculating intersection LOS would not adequately describe traffic conditions. Instead, impacts 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. As shown in Table 4.1.3-10, while the amount of vehicular traffic associated with the new stadium is expected to be similar to, or slightly less than, the amount of traffic associated with the existing stadium because of the improved transit service proposed to serve the new stadium. The amount of time required to clear football game related traffic would range from 49 minutes to one hour 28 minutes.

As shown in Table 4.1.3-11, the proposed location of the new stadium (inside of HPS) would create additional exit routes (e.g., Innes Ave, Evans Ave, Jennings St, and Cesar Chavez St) such that more streets would be congested following a game than under the 2030 baseline conditions. Providing additional egress routes would spread the post-game congestion; however, it would result in game day traffic congestion along Innes Ave, Evans Ave, and Cargo Way, which would not experience substantial congestion following a game under the 2030 baseline condition.

One result of providing additional egress routes from the proposed new stadium is that traffic congestion is expected to clear the area in less time. As shown in Table 4.1.3-10, the projected clearance time for a sell-out game at the proposed stadium would be about one and a half hours, compared to almost three hours for the existing stadium under 2030 baseline conditions. The projected clearance time is based on the stadium travel demand described in Section 4.1.1.2.3. Due to the multiple access routes serving the stadium, the number of roadways expected to experience post-game traffic congestion is expected to increase with the new stadium; however, the total duration of expected post-game congestion is expected to be considerably less than under the 2030 baseline condition.

Figure 4.1.3-6. Proposed Stadium Game Day Ingress Routes

Figure 4.1.3-7 Proposed Stadium Game Day Egress Routes

Table 4.1.3-10. Post-Game Exit Demand and Clearance Times

Scenario	Assumptions	Exit Demand (vehicles)		Clearance Time (hours:minutes)	
		Existing Stadium	HPS Stadium	Existing Stadium[a]	HPS Stadium: With US-101 Interchange[b]
Most Conservative	Sold-out event, everyone leaves at end of event	21,875	17,075	2:50	1:28
	Sold-out event, 10 percent leave early, 5 percent stay late	18,590	14,510	2:25	1:14
	90 percent attendance, 10 percent leave early, 5 percent stay late	16,730	13,060	2:10	1:11
Average	90 percent attendance, 15 percent leave early, 5 percent stay late	15,750	12,290	2:03	1:07
	80 percent attendance, 15 percent leave early, 5 percent stay late	14,000	10,930	1:49	1:00
	80 percent attendance, 20percent leave early, 5 percent stay late	13,130	10,250	1:53	0:56
Least Conservative	70 percent attendance, 20 percent leave early, 5 percent stay late	11,480	8,960	1:29	0:49

Notes:
a. Based on existing stadium clearance capacity of 7,700 vehicles per hour.
b. 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: Appendix D of the CP-HPS DEIR [SFRA 2009].

Table 4.1.3-11. Locations of Congestion Following Football Games

Exit Route	2030 Baseline (Existing Stadium)	Alternative 1 (HPS Stadium)
Harney Way, between Candlestick Park and US-101	X	X
Jamestown, Ingerson, Gilman, and Carroll Avenues, between Candlestick Park and Third St	X	X
Paul Ave, between Third St and Bayshore Blvd	X	X
Third St, between Jamestown and Cesar Chavez St	X	X
Innes Ave/Hunters Point Blvd, between Earl St and Jennings St		X
Jennings St/Cargo Way/Illinois St, between Evans Ave and 25th St		X
Evans Ave, between Jennings St and Cesar Chavez St		X
Cesar Chavez St, between US-101 and I-280		X

Note: Analysis based on expected stadium exit routes. Other exit routes 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: CHS Consulting Group, *et al*. 2009.

As shown in Table 4.1.3-12, two freeway facilities, I-280 southbound between the Alemany Blvd off- and on-ramps and US-101 northbound at the onramp from Bayshore Blvd would actually see improvements, compared to the 2030 No Action Alternative 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 St/Indiana St and Mariposa St.

Local streets and freeway facilities would still experience congestion following a football game as described in Tables 4.1.3-10, 4.1.3-11, and 4.1.3-12, and traffic impacts associated with the new stadium during game days would be *significant* based on the discussion of existing game day conditions in Section 3.1.4.8.

Alternative 1 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. Limiting parking supply is not expected to create secondary impacts in the surrounding neighborhoods because it would be implemented with the increase in transit capacity. It is expected that most patrons would shift from driving to transit during game days. Widening roadways to mitigate game day impacts would have unwanted secondary impacts on pedestrian and bicycle conditions during non-game days, which would be most of the time, and were not considered further. **Mitigation 7** is proposed so that game day traffic impacts are kept to a minimum. Implementing **Mitigation 7** would likely reduce automobile travel to the stadium and encourage transit usage. Nevertheless, game day traffic would, even with mitigation, result in considerable delays on some roadways for limited periods. Traffic volume impacts during games would be *significant and unavoidable even with mitigation* as indicated in Table 4.1.3-13.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 2 on game days would not be different for this variant.

Table 4.1.3-12. Freeway LOS Analysis – 2030 Baseline and Alternative 1 Conditions Sunday Peak Hour Football Game

Freeway	*Direction*	*Location*	*2030 Baseline*		*Alternative 1*	
			Density[1]	*LOS*	*Density[1]*	*LOS*
Basic Sections						
US-101	NB	Cesar Chavez St to I-80 Merge	>45	F	>45	F
US-101	NB	Harney Way to Third St/Bayshore Blvd	>45	F	>45	F
US-101	SB	Third St/Bayshore Blvd to Harney Way	>45	F	>45	F
US-101	SB	Harney Way to Sierra Point on-ramp	>45	F	>45	F
I-280	SB	Alemany Blvd off- to Alemany on-ramp	35.4	E	30.8	D
Weaving Section[2]						
I-280	NB	25th St on-ramp to Mariposa off-ramp	1,220	C	>1,900	F
Merge Sections						
US-101	NB	Harney Way (future)	>45	F	>45	F
US-101	NB	NB Bayshore Blvd	>45	F	34.6	D
US-101	NB	Alemany Blvd/Industrial St	>45	F	>45	F
US-101	NB	NB Bayshore Blvd/Cesar Chavez St	>45	F	>45	F
US-101	SB	EB Cesar Chavez St/Potrero	>45	F	>45	F
US-101	SB	Alemany Blvd/San Bruno Ave	21.2	C	22.4	C
US-101	SB	SB Third St/Bayshore Blvd	>45	F	>45	F
US-101	SB	Harney Way (future)	>45	F	>45	F
US-101	SB	Sierra Point Pkwy/Lagoon Rd	>45	F	>45	F
I-280	NB	NB Indiana St/25th St	>45	F	>45	F

Notes:
1. Density measured in passenger cars per lane per mile. Density undefined for LOS F conditions.
2. For weave section, weaving volume is reported.

Source: CHS Consulting Group, *et al*. 2009.

Mitigation Measure

Mitigation 7. Develop and maintain a Stadium Event Transportation Management Plan (Stadium TMP).

Implementation of a Stadium TMP identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the stadium operator and SFMTA. The stadium operators would develop and maintain the Stadium TMP for the stadium. The stadium operator would 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, fund, and refine the Stadium TMP, as determined appropriate by SFMTA. The City and County of San Francisco and SFMTA would be responsible for the enforcement of the mitigation and compliance monitoring. The final Stadium TMP would be approved by SFMTA. Preparation of the Stadium TMP would be fully funded by the stadium operator and would be completed in time for implementation on opening day of the stadium. The following actions would be included in the Stadium TMP:

- Information on transportation options to the stadium, including game day service by the various regional service providers, would 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 San Francisco 49ers website, would be updated and maintained;
- The use of charter buses to the stadium would be encouraged and expanded. A number of measures would be considered that could be implemented at low-cost to expand the use of group charters, including reducing parking costs, publicizing the groups in San Francisco 49ers publications and mailings, providing priority parking, providing lounges for bus drivers, and providing support services for rooter clubs;
- Residential Permit Parking Program and/or additional parking restrictions, such as time limits, during game days, particularly in the BVHP areas, would 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 would implement measures to encourage carpools of 4-plus persons per vehicle;
- The stadium operator would charge a higher parking cost for low occupancy vehicles;
- The stadium operator would develop a separate TDM plan for employees of the stadium and concessionaires. The plan would 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 would not receive preferential parking;
- The stadium operator would 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; and
- The Event TMP would ensure that regular transit routes operate acceptably near the stadium. The plan would consider providing alternate routes for those transit lines that do not have exclusive right-of-way on game days (48-Quintara-24th St, 44-O'Shaughnessy, 29-Sunset) onto transit-only facilities such as the BRT right-of-way to the south and Palou Ave to the north (which would be a transit-only facility on game days).

4.1.3.3.2 Factor 3: Transit Impacts from Stadium Football Games

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 Transit Center. Special game day transit, including charter buses and public transit express service, would access the stadium via Palou Ave, which would be converted to transit-only on game days. These buses would conduct passenger loading and unloading on Crisp Rd 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, approximately 16,390 spectators and 650 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.

As presented in Table 4.1.3-13, 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. 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 4.1.3-13. Game Day Muni Capacity by Line

Route	*One-Way Hourly Capacity (passengers per hour)*
24-Divisadero	400[a]
28L-19th Ave/Geneva Ave	800[a]
44-O'Shaughnessy	450[a]
48-Quintara	250[a]
Game Day Express Service (75X, 77X, 78X, 79X, 86, and 87)	6,500[b]
Total	***8,400***

Notes:
a. Assumes Sunday peak hour capacity is 75 percent of typical weekday peak hour capacity, per SFMTA TEP assumptions.
b. Based on existing ridership on these express routes.
Source: SFMTA, Fehr & Peers 2009.

With implementation of **Mitigation 8**, the Alternative 1 impacts to transit service on Sundays during a football game would be reduced. However, traffic impacts during post-game conditions would still degrade transit operations due to congestion. This impact could not be fully mitigated. Therefore, the impact of game day traffic on transit operations would *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transit impacts associated with games on Factor 2 would not be different for this variant.

Mitigation Measure

Mitigation 8. Increase frequency of regularly scheduled Muni routes serving the stadium area.

Implementation and funding of this mitigation identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the stadium operator and

SFMTA. The mitigation would need to be approved and implementable prior to opening day of the stadium. SFMTA would increase frequency on regularly scheduled Muni routes serving the stadium area on game days. In addition, the stadium operator would 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 would be determined based on patron characteristics that may evolve over time, the increased transit service, taken as an aggregate, would generally compensate for the projected shortfall of 3,600 passengers per hour on the existing and proposed transit lines. The City and County of San Francisco and SFMTA would be responsible for the enforcement of the mitigation and compliance monitoring. The SFMTA would review and approve a game day transit operating plan.

4.1.3.3.3 Factor 4: Bicycle Network and Circulation Impacts from Stadium Football Games

Alternative 1 would improve bicycle access to the area in terms of new bicycle lanes on existing and reconfigured roadways, and bicycle access within the project site and in the project vicinity would be maintained on game days. 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 Ave instead of Gilman Ave for access to and from the stadium).

For those spectators arriving by bicycle, the proposed stadium would provide improved amenities compared to the existing stadium. Bicycle racks, lockers, and bicycle valet services would be provided at the stadium entrances.

Bicycle access to the stadium on football game days would be difficult, as at present, due to heavy traffic volumes (e.g., streets with heavy traffic would pose a greater challenge for bicycle travel and would potentially cause bicyclists to divert to roadways not designated as stadium access routes). However, new bicycle lanes on existing and reconfigured roadways to access to the new stadium would be provided, and impacts on bicycle operations would therefore be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

4.1.3.3.4 Factor 5: Pedestrian Circulation Impacts from Stadium Football Games

Pedestrian access to the stadium from offsite locations would be provided via 15-ft (4.5-m) sidewalks on either side of Crisp Rd. All other streets leading into the stadium site would provide 12- to 15-ft (3.6- to 4.5-m) sidewalks. Near the stadium, game day pedestrians would be allowed to cross Crisp Rd at two locations where the Ring Rd intersects Crisp Rd. Pedestrians traveling between the stadium and the 3,000 parking spaces in the HPS R&D campus would cross the Ring Rd on the south side of Crisp Rd. Because of the need to balance pedestrian flows with efficient auto egress, temporary pedestrian overcrossings, similar to the pedestrian bridge recently installed on Hunters Point Expressway at the location of the at-grade pedestrian crossing to the State Park parking lots, would be provided. Traffic control officers would 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. Pedestrian crossing in the vicinity of the stadium during game days would be difficult, as at present for the existing stadium, due to heavy traffic volumes (e.g., streets with heavy traffic volumes are difficult for pedestrians to cross). However, since pedestrian access would be maintained at approximately current levels (e.g., no closure of existing sidewalks or crosswalks), stadium game day impacts on pedestrian circulation would be *not significant*. Therefore, no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

4.1.3.3.5 Factor 6: Emergency Vehicle Access Impacts from Stadium Football Games

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 Dr route, emergency vehicles would be allowed to use the BRT-only lanes. Emergency vehicles would also be allowed to use Palou Ave, 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 Rd. Emergency vehicles would be able to enter the stadium parking lot via Crisp Rd. Emergency vehicles would also be able to use Innes Ave, as there would be at least one lane in each direction on this route open to traffic. Since the outbound direction may be congested immediately following games, this may not be as desirable a route as the Harney Way BRT lanes or Palou Ave. Since multiple emergency access routes would be provided, stadium game day impacts on emergency access would be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

4.1.3.3.6 Factor 7: Loading Impacts from Stadium Football Games

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 operator of appropriate delivery times.

Based on information obtained from the San Francisco 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 (Appendix D of the CP-HPS DEIR [SFRA 2009]). 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 impacts related to loading would be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

4.1.3.4 Stadium Secondary Event Impacts

4.1.3.4.1 Factor 2: Increase in Traffic Volumes from Stadium Secondary Events

Traffic generated by a secondary event would access the project site via Cesar Chavez St, Cargo Way, Evans Ave, Innes Ave, Bayshore Blvd, Third St, Carroll Ave, Gilman Ave, and Ingalls St. 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.

Table 4.1.3-14 compares the intersection LOS operating conditions for Alternative 1 weekday P.M. peak hour conditions without a secondary event to conditions with a secondary event. With a secondary event, additional intersections would operate at LOS E or LOS F conditions beyond those identified for the P.M. peak hour under Alternative 1 conditions, including:

- #1048 Evans Ave/Jennings St/Middle Point Rd;
- #110 Innes Ave/Donahue St; and
- #111 Donahue St/Galvez Ave.

Table 4.1.3-14. Intersection LOS – 2030 Alternative 1 and Secondary Event Conditions

Intersection		*Peak Hour*	*2030 Alternative 1*		*2030 Alternative 1 with Secondary Event*	
			LOS[a]	**Delay/ v/c[b]**	**LOS**	**Delay/ v/c**
City and County of San Francisco Streets						
#1002	Third St/Cesar Chavez St	P.M.	**F**	**>80/1.76**	**F**	**>80/1.76**
#1003	Third St/Cargo Way	P.M.	**F**	**>80/1.74**	**F**	**>80/1.74**
#1004	Third St/Evans Ave	P.M.	**F**	**>80/1.53**	**F**	**>80/2.11**
#1006	Third St/Palou Ave	P.M.	**F**	**>80/5.99**	**F**	**>80/5.99**
#1008	Third St/Carroll Ave	P.M.	**E**	**74.8/0.93**	**F**	**82.8/0.99**
#1009	Third St/Paul Ave/Gilman Ave	P.M.	**F**	**>80/3.36**	**F**	**>80/3.48**
#1016	Evans Ave/Cesar Chavez St	P.M.	**F**	**>80/1.84**	**F**	**>80/2.96**
#1048	Jennings St/Middle Point Rd/Evans Ave	P.M.	C	31.5	**F**	**>80/1.62**
#1058	Evans Ave/Napoleon St/Toland St	P.M.	**F**	**>80/1.61**	**F**	**>80/2.16**
Hunters Point Shipyard Streets						
#110	Innes Ave/Donahue St	P.M.	A	8.0	**F**	**>50/1.82**
#111	Donahue St/Galvez Ave	P.M.	C	18.1	**F (WBL)**	**>50/3.57**
#112	Donahue St/Lockwood St	P.M.	A	9.5	A	9.5
#113	Crisp Rd/I St (Outer Ring Rd)	P.M.	C	15.9	D	28.7
#114	Crisp Rd/Spear St (Inner Ring Rd)	P.M.	C	15.3	C	22.4
#115	Robinson St/Spear Ave	P.M.	**F (SBL)**	**>50/1.24**	**F (SBL)**	**>50/5.54**
#116	Lockwood St/Spear Ave	P.M.	B	14.6	B	14.6

Notes:
LOS – level of service; A.M. – A.M. Peak; P.M. – P.M. peak; Sun – Sunday Peak; NBL – northbound left turn; SBL – southbound left turn; EBL – eastbound left turn; WBL – westbound left turn.
a. Intersections operating at LOS E or LOS F conditions highlighted in bold..
b. Delay in seconds per vehicle and overall intersection volume-to-capacity (v/c) ratio is presented where intersections operating at LOS E or LOS F conditions. For side street STOP-controlled intersections, delay and LOS presented for worst approach.
Sources: CHS Consulting Group, *et al*. 2010; CHS Consulting Group, *et al*. 2009.

Traffic associated with a secondary event would exacerbate traffic operations at intersections that would operate at LOS E or LOS F conditions without a secondary event in the P.M. peak hour, including:

- #1004 Third St/Evans Ave;
- #1008 Third St/Carroll Ave;
- #1009 Third St/Paul Ave/Gilman Ave;
- #1016 Cesar Chavez St/Evans Ave;
- #1058 Evans Ave/Napoleon St/Toland St; and
- #115 Robinson St/Spear Ave.

Secondary event traffic would be added to the following freeway facilities that would operate at LOS E or LOS F during the weekday P.M. peak hour:

- US-101 northbound off ramp to Third St/Bayshore Blvd;
- US-101 northbound off ramp to Bayshore Blvd/Cesar Chavez St;
- US-101 southbound off ramp to Cesar Chavez;
- US-101 southbound off ramp to Bayshore Blvd/Third St;
- I-280 northbound off ramp to Cesar Chavez St; and
- I-280 southbound off ramp to Pennsylvania Ave.

Since these facilities would experience congested traffic prior to a secondary event, traffic impacts associated with the new stadium during secondary events would exacerbate existing congestion. **Mitigation 9** would minimize the traffic impacts associated with secondary events by ensuring more orderly traffic flow than would otherwise occur. Implementation of this mitigation measure would improve vehicle entrance and exit flows to the stadium site, maintain orderly traffic operations, and reduce intrusion onto neighborhood streets near the stadium. Even with the implementation of **Mitigation 9**, on days when special events are held at the stadium, the secondary event's impacts to the study roadway network would be *significant and unavoidable with mitigation*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

Mitigation Measure

Mitigation 9. Develop and maintain a Secondary Event Component as part of the Stadium TMP.

Implementation of this mitigation identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the stadium operator and SFMTA. The stadium operator would develop, fund, and maintain, as part of a Stadium TMP (**Mitigation 7**), a plan for secondary events. The Stadium TMP is a strategy for coordinating with representatives of SFMTA and the San Francisco 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 City and County of San Francisco and SFMTA would be responsible for the enforcement of the mitigation and compliance monitoring. The secondary event component of the Stadium TMP would be approved by SFMTA and would be implementable prior to opening day of the stadium.

4.1.3.4.2 Factor 3: Transit Impacts from Stadium Secondary Events

During secondary events with attendance of 37,500 spectators, regularly scheduled bus service adjacent to the stadium would continue to operate, providing direct service to the stadium and into the Hunters Point Transit Center. Additional secondary event-related transit service is not proposed. Table 4.1.3-15 presents the total one-way capacity that would be available during the weekday P.M. peak hour.

Table 4.1.3-15. Weekday P.M. Peak Hour One-Way Muni Capacity to Stadium by Line Weekday P.M. Conditions

Route	Peak Hour Frequency (minutes)	One-Way Hourly Capacity (passengers per hour)
24-Divisadero	6	635
28L-19th Ave/Geneva Ave	5	1,130
44-O'Shaughnessy	6	635
48-Quintara	10	380
HPX – Hunters Point Express	12	320
Total		**3,100**

Source: SFMTA, Fehr & Peers 2009.

During the weekday evening period, likely between 5:00 and 6:00 P.M., 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 P.M. peak hour on routes serving the stadium area (e.g., 24-Divisadero, 28L-19th Ave Limited, 44-O'Shaughnessey, 48-Quintara-24th St, and HPX as extended to serve the event). The overall one-way transit demand in the P.M. 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 4.1.3-15, the total one-way transit capacity serving the stadium site during a typical weekday P.M. peak hour would be 3,100 passengers per hour, which would result in 2,625 riders that would not be accommodated.

With implementation of **Mitigation 10**, Alternatives 1 and 1A's impacts on transit service on special event days would be reduced, but would still be *significant*. 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* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

Mitigation Measure

Mitigation 10. Increase frequency on Muni routes serving the stadium area prior to secondary events.

Similar to **Mitigation 8**, SFMTA would increase frequency on regularly scheduled Muni routes serving the stadium area prior to large special events. In addition, the stadium operator would 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 Ave Limited, and 44-O'Shaughnessey would already be operating near their maximum frequency. Therefore, this mitigation measure primarily applies to the 48-Quintara-24th St 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 would 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).

Implementation and funding of this mitigation identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the stadium operator and SFMTA. The mitigation would need to be approved and implementable prior to opening day of the stadium. SFMTA and the stadium operator would implement a stadium transportation systems plan similar to that developed for game-day operations (except that the Yosemite Slough bridge would not be available for private automobiles), on a case-by-case basis depending on the expected size of the secondary event. The City and County of San Francisco and SFMTA would be responsible for the enforcement of the mitigation and compliance monitoring. The SFMTA would review and approve a special event transit operating plan.

4.1.3.4.3 Factor 4: Bicycle Network and Circulation Impacts from Stadium Secondary Events

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 at the stadium by bicycle, the stadium would include bicycle racks, lockers, and bicycle valet services would be provided at the stadium entrances. 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 *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

4.1.3.4.4 Factor 5: Pedestrian Circulation Impacts from Stadium Secondary Events

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. 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 *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

4.1.4 Alternative 1A: Stadium Plan/No-Bridge Alternative

This section describes the construction and operational impacts for Alternative 1A (Stadium Plan/No–Bridge Alternative). The land use program for Alternative 1A would be the same as Alternative 1; however, Alternative 1A would modify the circulation plan proposed under the *CP-HPS Phase II Development Plan* and would not include construction of the Yosemite Slough bridge. Impacts to transportation from operation of Alternative 1A would be similar to those discussed for Alternative 1 (Section 4.1.3.1.2).

Under Alternative 1A, since the Yosemite Slough bridge would not be constructed, certain motorized and non-motorized traffic would be required to circumnavigate the slough. Between the intersection of Carroll Ave/Arelious Walker Dr and Crisp Rd within HPS, the proposed BRT line would be routed on Carroll Ave between Arelious Walker Dr and Hawes St, on Hawes St between Carroll Ave and Armstrong Ave (currently unimproved), on Armstrong Ave between Hawes St and the DoN rail right-of-way, along the DoN rail right-of-way between Armstrong Ave and Shafter Ave, along Shafter Ave between the DoN rail right-of-way and Arelious Walker Dr, and on Arelious Walker Dr between Shafter Ave and Crisp Rd (currently unimproved). The figure illustrating the proposed route is included in Appendix L, Transportation, Traffic, and Circulation Resource Data.

- On Carroll Ave 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 St between Carroll Ave and Armstrong Ave, and Arelious Walker Dr between Shafter Ave and Crisp Rd are currently unimproved streets and would be built out to accommodate one transit-only travel lane in each direction;
- The DoN rail right-of-way between Armstrong Ave and Shafter Ave would be improved to provide one transit-only travel lane in each direction; and
- Shafter Ave between the rail right-of-way and Arelious Walker Dr 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 4 ft (1.2 m) (from 15 to 11 ft [4.5 to 3.3 m] wide) on both sides of the street.

Consistent with Alternative 1 trip generation, Alternative 1A would generate 1,924 weekday A.M., 2,164 weekday P.M., and 1,666 Sunday P.M. peak hour vehicle trips

4.1.4.1 Construction Impacts

Impacts to transportation resources associated with construction activities for Alternative 1A would be comparable to those for Alternative 1 because the construction methods and construction footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1.

The Alternative 1A development program is the same as Alternative 1; however, Alternative 1A would not include construction of the Yosemite Slough bridge. Therefore, Alternative 1A 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 Alternative 1.

4.1.4.1.1 Factor 1: Construction Vehicle Traffic and Roadway Impacts

Construction activities associated with Alternative 1A would be similar to Alternative 1. Development and implementation of **Mitigation 1** (Construction TMP as described for Alternative 1) would help minimize Alternative 1A's contribution to cumulative construction-related traffic impacts. Some disruption and increased delays would still occur even with implementation of a construction TMP. Therefore, significant construction-related traffic impacts on local and regional roadways would still be possible. Localized construction-related traffic impacts would therefore *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 1 would not be different for these variants.

4.1.4.2 Operational Impacts

Impacts to transportation from operation of Alternative 1A would be similar to those discussed for Alternative 1 (Section 4.1.3.3.2, Operational Impacts), with the exception that Alternative 1A operations would not include the Yosemite Slough bridge. Because the Yosemite Slough bridge would not allow auto travel on non-game days in Alternative 1, the weekday traffic circulation patterns would be the same for both alternatives.

Without the bridge across Yosemite Slough, the proposed new BRT route traveling between Balboa Park BART Station and the Hunters Point Transit Center would follow a different alignment than under Alternative 1. Instead of a direct route across Yosemite Slough, the BRT route would travel west along Carroll Ave, north along Hawes St, and then west on Armstrong Ave, where it would join the DoN 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 Ave. The route would continue east on Shafter Ave to Arelious Walker, where it would reassume the same alignment as Alternative 1. Operation of the BRT within the rail right-of-way would not affect study intersection operations. Therefore, the traffic impacts associated with Alternative 1A would be the same as Alternative 1.

4.1.4.2.1 Factor 2: Increase in Traffic Volumes

PROJECT TRAVEL DEMAND MANAGEMENT PLAN

Alternative 1A would be similar to Alternative 1. As discussed in the Alternative 1 analysis, the final TDM Plan has not yet been formally approved and **Mitigation 2** requires preparation, approval, and implementation of the final TDM Plan. With implementation of **Mitigation 2**, Alternative 1A 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. The impact to traffic would *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 2 would not be different for this variant.

Intersection Traffic Impacts

The study intersections that would require mitigation or have significant and unavoidable impacts due to the increase in traffic volumes with implementation of Alternative 1 would also apply to Alternative 1A. Section 4.1.3.3.1, Increase in Traffic Volumes, discusses traffic effects of those intersections and the feasibility of mitigation measures. The intersection LOS is shown in Table 4.1.4-1. Figure 4.1.4-1 shows the weekday A.M./P.M. peak hour intersection volumes, and Figure 4.1.4-2 shows the Sunday P.M. peak hour volumes.

Table 4.1.4-1. Intersection LOS – 2030 Baseline and Alternative 1A Conditions								
Intersection		***Peak Hour***	***2030 Baseline***[d]		***Alternative 1A***			
			LOS[a]	**Delay/ v/c**[b]	**LOS**	**Delay/ v/c**	**Percent**[c]	**Impact**
City and County of San Francisco Streets								
#1002	Third St/Cesar Chavez St	A.M.	**F**	**>80/1.49**	**F**	**>80/1.63**	**8.5**	●
		P.M.	**F**	**>80/1.45**	**F**	**>80/1.76**	**7.8**	●
		Sun	C	29.2	**E**	**65.6/0.73**	**--**	● PI
#1003	Third St/Cargo Way	A.M.	**F**	**>80/1.21**	**F**	**>80/1.90**	**9.8**	●
		P.M.	**F**	**>80/1.23**	**F**	**>80/1.74**	**8.9**	●
		Sun	C	29.2	C	30.0	--	○
#1004	Third St/Evans Ave	A.M.	**F**	**>80/1.13**	**F**	**>80/1.43**	**12.5**	●
		P.M.	**F**	**>80/1.18**	**F**	**>80/1.53**	**10.0**	●
		Sun	D	**44.0**	**E**	**58.8/0.87**	--	● PI
#1006	Third St/Palou Ave	A.M.	D	**54.9**	**F**	**>80/1.91**	--	● PI
		P.M.	**F**	**>80/1.51**	**F**	**>80/5.99**	**10.5**	●
		Sun	**E**	**75.5/0.67**	**F**	**>80/4.03**	**16.6**	●
#1008	Third St/Carroll Ave	A.M.	B	11.0	C	23.1	--	○
		P.M.	B	13.4	**E**	**74.8/0.93**	--	● PI
		Sun	B	10.2	**E**	**55.1/0.66**	**--**	● PI
#1009	Third St/Paul Ave/Gilman Ave	A.M.	**F**	**>80/1.15**	**F**	**>80/2.00**	4.5	○ NSC
		P.M.	**F**	**>80/1.27**	**F**	**>80/3.36**	4.1	○ NSC
		Sun	**E**	**62.8/0.71**	**F**	**>80/1.89**	**6.1**	●
#1016	Evans Ave/Cesar Chavez St	A.M.	**F**	**>80/1.85**	**F**	**>80/1.91**	**6.6**	●
		P.M.	**F**	**>80/1.78**	**F**	**>80/1.84**	**5.4**	●
		Sun	B	16.9	B	19.1	--	○
#1048	Jennings St/Middle Point Rd/Evans Ave	A.M.	C	22.9	C	27.7	--	○
		P.M.	C	29.1	C	31.5	--	○
		Sun	B	19.7	B	19.9	--	○
#1058	Evans Ave/Napoleon St/Toland St	A.M.	**F**	**>80/1.12**	**F**	**>80/1.50**	**6.9**	●
		P.M.	**F**	**>80/1.48**	**F**	**>80/1.61**	**5.4**	●
		Sun	**E**	**57.3/0.48**	**E**	**59.9/0.57**	**9.2**	●
Hunters Point Shipyard Streets								
#110	Innes Ave/Donahue St	A.M.	B	14.5	A	9.6	--	○
		P.M.	B	14.7	A	8.0	--	○
		Sun	B	15.2	A	9.0	--	○
#111	Donahue St/Galvez Ave	A.M.	A	8.7	C	15.8	--	○
		P.M.	A	8.8	C	18.1	--	○
		Sun	A	8.7	B	11.9	--	○
#112	Donahue St/Lockwood St	A.M.	A	8.5	A	9.2	--	○
		P.M.	A	8.5	A	9.5	--	○
		Sun	A	8.5	A	8.9	--	○
#113	Crisp Rd/I St (Outer Ring Rd)	A.M.	Proposed Intersection		C	16.8	--	○
		P.M.			C	15.9	--	○
		Sun			C	20.9	--	○
#114	Crisp Rd/Spear St (Inner Ring Rd)	A.M.	A	7.4	C	15.7	--	○
		P.M.	A	7.4	C	15.3	--	○
		Sun	A	7.4	C	16.8	--	○
#115	Robinson St/Spear Ave	A.M.	Proposed Intersection		**F (SBL)**	**>50/0.66**	**--**	⊙ PI
		P.M.			**F (SBL)**	**>50/1.24**	**--**	⊙ PI
		Sun			C	17.0	--	○

Table 4.1.4-1. Intersection LOS – 2030 Baseline and Alternative 1A Conditions

Intersection		Peak Hour	2030 Baseline[d]		Alternative 1A			
			LOS[a]	Delay/ v/c[b]	LOS	Delay/ v/c	Percent[c]	Impact
#116	Lockwood St/Spear Ave	A.M.	A	8.4	C	16.9	--	○
		P.M.	A	8.5	B	14.6	--	○
		Sun	A	8.4	A	9.4	--	○

Notes:

LOS – level of service; A.M. – A.M. Peak; P.M. – P.M. peak; Sun – Sunday Peak; NBL – northbound left turn; SBL – southbound left turn; SBT – southbound through; EBL – eastbound left turn; WBL – westbound left turn; NSC – no significant contribution; PI – project impact.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

a. Intersections operating at LOS E or LOS F conditions highlighted in bold.

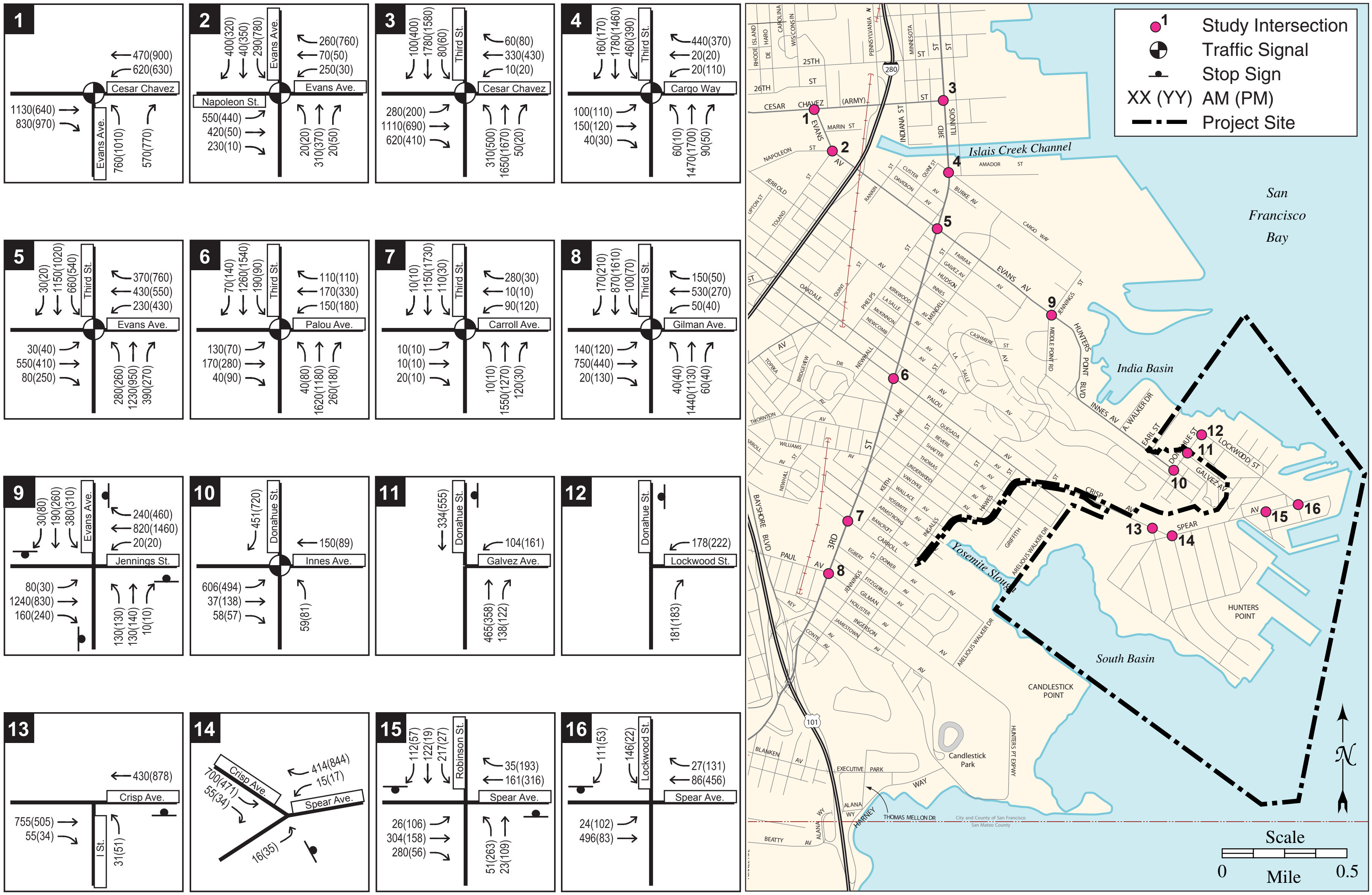
b. Delay in seconds per vehicle overall intersection volume-to-capacity (v/c) ratio is presented. where intersection operating at LOS E or F conditions. For side street STOP-controlled intersections, delay and LOS presented for worst approach.

c. Percent contribution of project traffic.

d. 2030 baseline does not include HPS Phase II entitlements.

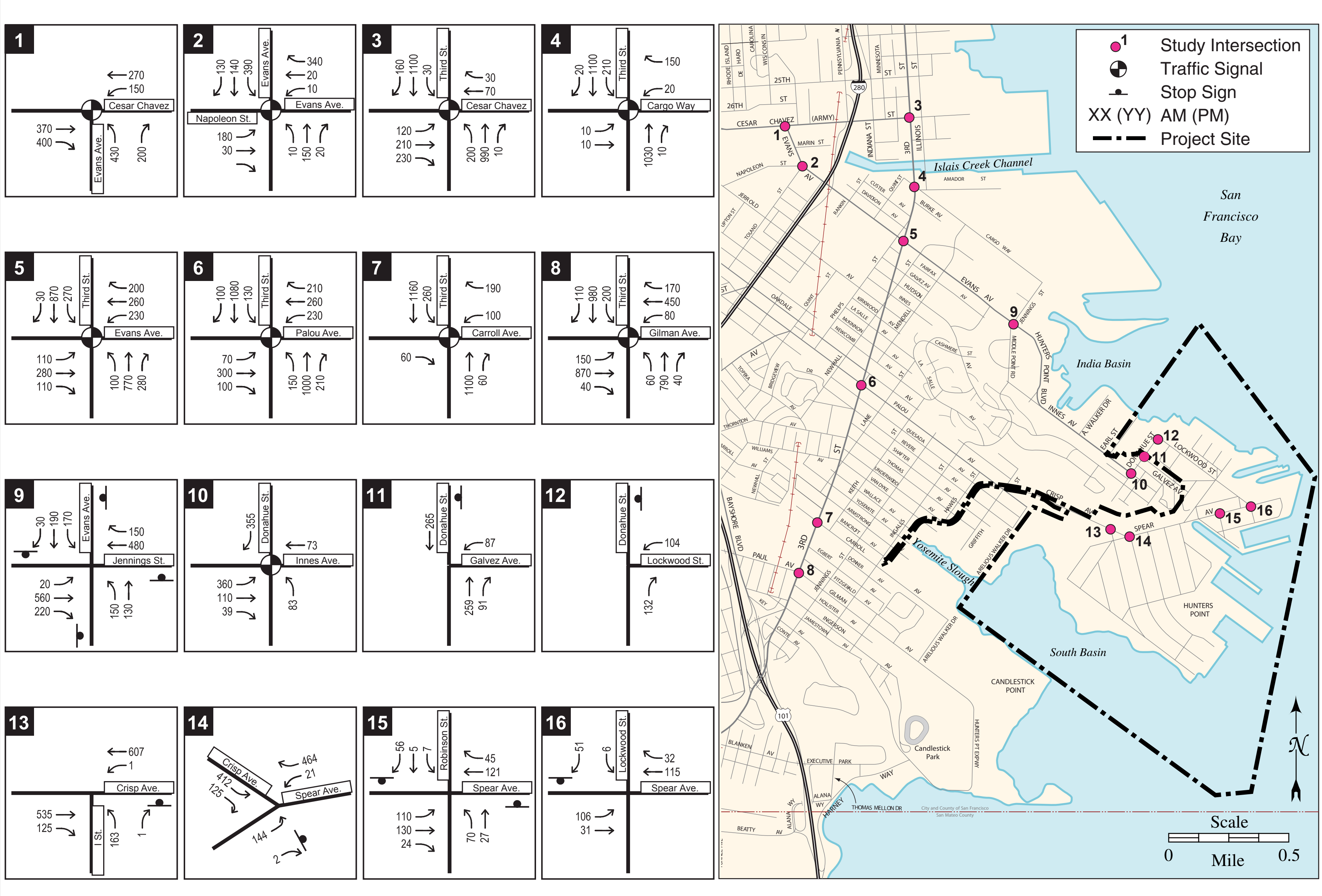
e. Significant cumulative and project impacts are presented, and the project impact is distinguished by using the "PI" designation.

Sources: CHS Consulting Group, *et al*. 2010; CHS Consulting Group, *et al*. 2009.



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.4-1. Weekday A.M. and P.M. Peak Hour Traffic Volumes - Alternative 1A



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.4-2. Sunday P.M. Peak Hour Traffic Volumes - Alternative 1A

INTERSECTIONS WITH NOT SIGNIFICANT IMPACTS

The following intersections are expected to operate at acceptable levels of service; therefore, the impact would be *not significant* and no mitigation is proposed.

#1048 Jennings St/Middle Point Rd/Evans Ave;

#110 Innes Ave/Donahue St;

#111 Donahue St/Galvez Ave;

#112 Donahue St/Lockwood St;

#113 Crisp Rd/I St (Outer Ring Rd);

#114 Crisp Rd/Spear St (Inner Ring Rd); and

#116 Lockwood St/Spear Ave.

INTERSECTIONS WITH PROJECT AND CUMULATIVE TRAFFIC IMPACTS

The results show that the following study intersections are projected to operate at unacceptable levels with Alternative 1A and would result in project-specific impacts or would contribute to significant cumulative impacts during at least one peak hour.

#1002 Third St/Cesar Chavez St – project and cumulative *(significant and unavoidable)*;

#1003 Third St/Cargo Way – project and cumulative *(significant and unavoidable)*;

#1004 Third St/Evans Ave – project and cumulative *(significant and unavoidable)*;

#1006 Third St/Palou Ave – project and cumulative *(significant and unavoidable)*;

#1008 Third St/Carroll Ave – project-specific *(significant and unavoidable)*;

#1009 Third St/Paul Ave/Gilman Ave – project and cumulative (*significant and unavoidable)*;

#1016 Evans Ave/Cesar Chavez St – project and cumulative (*significant and unavoidable)*;

#1058 Evans Ave/Napoleon St/Toland St – project and cumulative *(significant and unavoidable)*; and

#115 Robinson St/Spear Ave – project-specific *(significant and mitigable)*.

At intersections that would operate at LOS E or LOS F under 2030 baseline conditions and would continue to operate at LOS E or LOS F under 2030 cumulative conditions, the increase in vehicle trips from 2030 baseline was reviewed to determine whether the increase would contribute considerably (by five percent or more) to critical movements operating at LOS E or LOS F. Alternative 1A contributions were determined to be significant and no feasible mitigation measures were identified for intersections described as "project and cumulative *(significant and unavoidable)*" in the list above.

The degradation in LOS would primarily be due to project-related traffic increases along Third St and Carroll Ave. To accommodate additional right-of-way needed for additional lanes, Third St would need to be widened. This would require demolition of existing structures and substantial right-of-way acquisition and would not be sufficient to improve intersection operating conditions to acceptable levels. Due to the issues related to acquisition of additional right-of-way, mitigation was determined to be infeasible. Traffic impacts at this intersection under Alternative 1A conditions would *remain significant and unavoidable*.

As described above (see Section 4.1.3.3.1, Increase in Traffic Volumes), implementation of **Mitigation 3** would minimize Alternative 1A transportation impacts. Therefore, traffic impacts at the single intersection of Robinson St/Spear Ave would be *not significant with mitigation*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation intersection impacts associated with Factor 2 would not be different for this variant.

FREEWAY TRAFFIC IMPACTS

Freeway Segment Impacts

Alternative 1A would create impacts at similar freeway mainline sections and freeway ramp junctions as noted for Alternative 1 (Section 4.1.3.3.1, Increase in Traffic Volumes).

Table 4.1.4-2 presents the results of the mainline LOS analysis and summarizes the mainline segment impacts for 2030 baseline and Alternative 1A conditions. In some cases, the mainline segments operate at acceptable levels with the addition of project traffic during a specific peak periods. The increase in traffic due to Alternative 1A would result in increases in traffic volumes on the freeway segments that would cause the operations on all the study area freeway segments to deteriorate from the already LOS F conditions; however, the percent contribution of Alternative 1A traffic is not considered significant and does not significantly contribute to the traffic impacts. Because impacts would be *not significant*, no mitigation is proposed.

Table 4.1.4-2. Mainline Segment LOS and Segment Impacts – 2030 Baseline and Alternative 1A Conditions

Ramp Location	Peak	2030 Baseline		Alternative 1A			
		LOS	Density [a]	LOS	Density	Percent[b]	Impact
US-101, the SF County Line NB	A.M.	**F**	**>45**	**F**	**>45**	1.6	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0.9	○ NSC
	Sun	D	30.3	D	32.3	--	○
US-101, the SF County Line SB	A.M.	**F**	**>45**	**F**	**>45**	0.7	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.3	○ NSC
	Sun	D	31.8	D	34.3	--	○
SF/Oakland Bay Bridge EB	A.M.	**F**	**>45**	**F**	**>45**	1.2	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	2.2	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	1.2	○ NSC
SF/Oakland Bay Bridge WB	A.M.	**F**	**>45**	**F**	**>45**	1.0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0.7	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	0.6	○ NSC
I-280, south of US-101 NB	A.M.	**F**	**>45**	**F**	**>45**	0.8	○ NSC
	P.M.	D	33.2	D	33.3	--	○
	Sun	C	21.6	C	21.6	--	○
I-280, south of US-101 SB	A.M.	D	34.4	D	34.6	--	○
	P.M.	**F**	**>45**	**F**	**>45**	0.8	○ NSC
	Sun	D	29.5	D	29.5	--	○

Notes:
SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution.
● - Significant and unavoidable (no feasible mitigation)
⦿ - Significant and mitigable (not significant with mitigation)
○ - Not significant
a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.
b. Percent contribution of project traffic.
Source: CHS Consulting Group, *et al*. 2010.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 2 and freeway segments would not be different for this variant.

FREEWAY RAMP IMPACTS

Alternative 1A would create similar significant traffic impacts to freeway ramp junctions as Alternative 1. Table 4.1.4-3 presents the results of the ramp junction merge (on-ramp) and diverge (off-ramp) analysis and summarizes the impacts for 2030 baseline and Alternative 1A conditions. As described in the discussion of Alternative 1 impacts in Section 4.1.3.3.1, Increase in Traffic Volumes, no feasible mitigation measures have been identified for the freeway ramp junctions expected to experience significant impacts under Alternative 1 conditions. Therefore, traffic impacts at the freeway ramp junctions under Alternative 1A would *remain significant and unavoidable*.

Table 4.1.4-3. Ramp Junction LOS and Segment Impacts – 2030 Baseline and Alternative 1A Conditions

Ramp Location	Peak	2030 Baseline		Alternative 1A			
		LOS	Density[a]	LOS	Density	Percent[b]	Impact
US-101 NB Off to Third St/Bayshore Blvd	A.M.	D	31.3	D	32.6	--	○
	P.M.	**E**	**35.5**	**E**	**37.3**	**8.6**	●
	Sun	C	22.8	C	24.0	--	○
US-101 NB On from Third St/Bayshore Blvd	A.M.	C	22.3	C	23.6	--	○
	P.M.	C	27.9	D	30.0	--	○
	Sun	C	21.9	C	22.4	--	○
US-101 NB Off to Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	2.3	○ NSC
	P.M.	**E**	**39.4**	**E**	**40.7**	0.4	○ NSC
	Sun	D	29.7	D	30.5	--	○
US-101 NB On from Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	2.1	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	**6.1**	●
	Sun	D	31.4	**F**	**>45**	**5.2**	●
US-101 SB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	4.6	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	4.8	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	4.5	○ NSC
US-101 SB Off to Bayshore Blvd/Third St	A.M.	**E**	**39.8**	**E**	**41.4**	0	○ NSC
	P.M.	**E**	**36.1**	**E**	**37.3**	0	○ NSC
	Sun	C	24.6	C	25.0	--	○
US-101 SB On from Bayshore Blvd/Third St	A.M.	**F**	**>45**	**F**	**>45**	**8.1**	●
	P.M.	**F**	**>45**	**F**	**>45**	**10.7**	●
	Sun	C	23.7	C	26.0	--	○
I-280 NB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	Sun	C	26.0	C	26.0	--	○
I-280 NB On from Indiana St	A.M.	**F**	**>45**	**F**	**>45**	**7.9**	●
	P.M.	**F**	**>45**	**F**	**>45**	**13.9**	●
	Sun	C	25.2	C	26.0	--	○
I-280 SB Off to Pennsylvania Ave	A.M.	**E**	**36.3**	**E**	**36.9**	**16.8**	●
	P.M.	**F**	**>45**	**F**	**>45**	**8.0**	●
	Sun	D	30.6	D	30.9	--	○

Notes:

SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.

b. 4Percent contribution of project traffic.

Source: CHS Consulting Group, *et al*. 2010.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 2 and freeway ramp impacts would not be different for this variant.

4.1.4.2.2 Factor 3: Transit Impacts

The transit impact analysis performed for Alternative 1 (see Section 4.1.3.2.3, Transit Impacts) also applies to Alternative 1A conditions. Therefore, the same impacts and mitigation measures would apply.

Final Transit Plan

As discussed in Alternative 1, although there is a plan for increased transit service to the transit study area, **Mitigation 4** requires preparation and implementation of the final Transit Plan since the final Transit Plan has not been formally approved by SFMTA. Thus, **Mitigation 4** requires preparation, approval, and implementation of the final transit-operating plan.

Ridership and Capacity Utilization at Study Area Cordons

The transit operating plan assumed for Alternative 1A would be the same as for Alternative 1. However, since the Yosemite Slough bridge would not be constructed, the BRT route would travel around Yosemite Slough. The alternate route would extend west on Carroll Ave, north on Hawes St, and west on Armstrong Ave to an abandoned railroad right-of-way previously operated by DoN. The BRT route would then travel along this right-of-way, just east of Ingalls St, to its intersection with Shafter St, just east of Hawes St. The BRT route would travel east on Shafter St to Arelious Walker Dr, where it would resume its primary proposed route into HPS.

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 the most direct route of travel between HPS 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 (28L-19th Ave/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 HPS would decrease by approximately 15 percent compared to the forecasts presented for Alternative 1. However, because this represents a relatively small portion of the overall project transit ridership, the additional traffic generated by Alternative 1A would be minimal, and therefore a separate analysis was not conducted.

With the Muni transit capacity increases assumed for Alternative 1A, compared to the 2030 baseline, the total transit travel demand on Muni would be accommodated at each of the three cordons during the A.M. and P.M. peak hours. At the regional screenlines, Alternative 1A would contribute minimally to future ridership and contributions to future cumulative impacts would be not significant. **Mitigation 4** requires that the final Transit Plan would be prepared and implemented. With implementation of **Mitigation 4**, as with Alternative 1, Alternative 1A impacts on transit capacity would be *not significant with mitigation*.

Transit Capacity Utilization at Downtown Screenlines

The capacity utilization for the downtown screenlines for the A.M. and P.M. peak hours for the cumulative conditions are summarized in Section 4.1.3.3.2, Transit Impacts. As discussed in the Alternative 1 analysis, impacts on transit capacity at the downtown screenlines would be *not significant*.

Transit Capacity and Utilization at Regional Screenlines

The capacity utilization for the regional transit provider screenlines for the A.M. and P.M. peak hours for existing, 2030 baseline, and 2030 cumulative conditions are summarized in Section 4.1.3.3.2, Transit Impacts. As discussed in the Alternative 1 analysis, the cumulative impacts and the proposed action's contribution to cumulative impacts on regional transit capacity would be *not significant*.

Transit Operations Impacts

Transit impacts associated with Alternative 1A would be the same as for Alternative 1, with the exception of the 28L-19th Ave/Geneva Limited. Under Alternative 1A, the Yosemite Slough bridge would not be constructed, and the BRT travel times would increase by about five minutes since the BRT route would need to travel around the slough. During the A.M. peak hour, an additional seven vehicles would be required to maintain projected headways, and during the P.M. peak hour an additional 12 vehicles would be required. As for Alternative 1, these transit vehicles would be in addition to those identified to maintain 2030 baseline conditions (16 vehicles in the A.M. peak hour and 16 vehicles in the P.M. peak hour).

Mitigations 5 and 6 would also be applicable for Alternative 1A. As with the Alternative 1, **Mitigations 5 and 6** would reduce, but not eliminate, Alternative 1A impacts on transit operations. Alternative 1A impacts on transit operations would therefore *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 3 would not be different for this variant.

4.1.4.2.3 Factor 4: Bicycle Network and Circulation

Alternative 1A bicycle trips would be accommodated within the proposed street network for this alternative which would improve bicycle routes and access within the new development and thereby improve the bicycle network and circulation in the vicinity. See the Alternative 1 discussion of bicycle network and circulation impacts in Section 4.1.3.2.4, Bicycle Network and Circulation. Operational impacts associated with Factor 4 would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or affect bicycle access. Therefore, transportation impacts associated with Factor 4 would not be different for this variant.

4.1.4.2.4 Factor 5: Pedestrian Circulation

Alternative 1A would improve sidewalks and the pedestrian network in the vicinity by ensuring adequate sidewalk widths and facilitating pedestrian circulation in areas not now served by such facilities. See the Alternative 1 discussion of Pedestrian Circulation impacts in Section 4.1.3.2.5, Pedestrian Circulation. Overall, impacts on pedestrian circulation associated with Factor 5 would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect pedestrian circulation. Therefore, transportation impacts associated with Factor 5 would not be different for this variant.

4.1.4.2.5 Factor 6: Emergency Access

Alternative 1A 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. 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), and emergency vehicles would be able to utilize transit lanes when streets are congested. Therefore, the impacts of Alternative 1A on emergency access associated with Factor 6 would be *not significant*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for this variant.

4.1.4.2.6 Factor 7: Loading Impacts

The loading impacts assessment associated with Alternative 1A would be the same as the assessment completed for Alternative 1 (Section 4.1.3.2.6, Loading Impacts). Impacts related to loading operations with Alternative 1A would be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect loading capacity. Therefore, transportation impacts associated with Factor 7 would not be different for this variant.

4.1.4.3 Stadium Football Game Impacts – Alternative 1A

The stadium football game impacts associated with Alternative 1A would be the same as for Alternative 1 (Section 4.1.3.4, Football Stadium Game Impacts). However, there would be a few differences in overall circulation as Alternative 1A does not include construction of a bridge over the Yosemite Slough. These differences are described below.

Because the Yosemite Slough bridge would be expected to accommodate four lanes of auto traffic into and out of the stadium before and after games, respectively, Alternative 1A would cause a loss of 40 percent of the ingress and egress roadway capacity by nearly 40 percent (total ingress and egress roadway lanes to and from the stadium would be reduced from the proposed 11 total auto lanes to 7). This would mean fewer vehicles can leave the stadium after the game, and thus similar or less congestion on area roadways due to limits imposed on the numbers of vehicles reaching more distant streets in any given time period, particularly those leading toward the US-101/Harney Way interchange. However, the lower exit capacity would likely render the new stadium infeasible as a desirable option for an NFL football team. **Mitigation 7 and Mitigation 8** also would be applicable to Alternative 1A.

4.1.4.3.1 Factor 2: Increase in Traffic Volumes from Stadium Football Games

Without the Yosemite Slough bridge, during football game days at the stadium the entrance and exiting capacity for vehicles would be reduced by forty percent compared to Alternative 1. This would result in delays on surface streets, but would reduce freeway ramp and segment impacts since their use would be limited by street capacity. Implementing **Mitigation 7** would reduce automobile travel to the stadium and encourage transit usage. Even with implementation of **Mitigation 7**, Alternative 1A impacts on Sunday pre-game and post-game period traffic conditions would *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic or adversely affect pedestrian circulation. Therefore, transportation impacts associated with Factor 2 would not be different for this variant.

4.1.4.3.2 Factor 3: Transit Impacts from Stadium Football Games

The transit impact analysis for stadium football games performed for Alternative 1 would also apply to Alternative 1A (Section 4.1.3.4, Stadium Football Game Impacts). Although an alternative transit/BRT route around Yosemite Slough would be technically feasible, it would not be an optimal configuration for a game day transit/BRT system. Alternative 1A would not accommodate the BRT route using the Yosemite Slough bridge proposed with Alternative 1.

The same impacts and mitigation measures would apply. With implementation of **Mitigation 8**, Alternative 1A impacts to transit service on Sundays during a football game would be minimized. 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* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic. Therefore, transportation impacts would not be different for this variant.

4.1.4.3.3 Factor 4: Bicycle Network and Circulation Impacts from Stadium Football Games

The bicycle impact analysis for stadium football games performed for Alternative 1 would also apply to Alternative 1A (Section 4.1.3.4.3, Bicycle Network and Circulation). However, bicycle access from the south to the stadium on football game days would be more difficult without the Yosemite Slough bridge. Bicycle access to the new stadium would be provided for Alternative 1A, and impacts on bicycle operations would be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic. Therefore, transportation impacts would not be different for this variant.

4.1.4.3.4 Factor 5: Pedestrian Circulation Impacts from Stadium Football Games

The pedestrian impacts analysis for the stadium football game performed for Alternative 1 would also apply to Alternative 1A (see Section 4.1.3.4.4, Pedestrian Circulation). However, pedestrian access from the south to the stadium on football game days would be more difficult without the Yosemite Slough bridge. Since pedestrian access would be maintained, stadium game day impacts on pedestrian circulation would be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic. Therefore, transportation impacts would not be different for this variant.

4.1.4.3.5 Factor 6: Emergency Vehicle Access Impacts from Stadium Football Games

Emergency vehicle access impacts for stadium football games for Alternative 1A would be similar to Alternative 1 (see Section 4.1.3.4.5, Emergency Access); however, the BRT-only lanes on the Harney Way/Arelious Walker Dr route would not exist because the bridge over Yosemite Slough would not be constructed. Since multiple emergency access routes would be provided, stadium game day impacts on emergency access would be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic. Therefore, transportation impacts would not be different for this variant.

4.1.4.3.6 Factor 7: Loading Impacts from Stadium Football Games

Loading impacts assessment associated with Alternative 1A would be similar to the assessment completed for Alternative 1 (Section 4.1.3.4.6, Loading Impacts). Impacts related to loading would be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic. Therefore, transportation impacts would not be different for this variant.

4.1.4.4 Stadium Secondary Event Impacts

All stadium secondary event impacts associated with Alternative 1A would be the same as described for Alternative 1 (Section 4.1.3.5, Stadium Secondary Event Impacts), and **Mitigation 9 and Mitigation 10** would apply. Table 4.1.4-4 summarizes these impacts.

Table 4.1.4-4. Stadium Secondary Event Impacts (Alternative 1A)

Description	*Impact*	*Comments*
Increase in Traffic Volumes (Factor 2)	◘	***Mitigation 9***
Transit Impacts (Factor 3)	◘	***Mitigation 10***
Bicycle Impacts (Factor 4)	○	
Pedestrian Impacts (Factor 5)	○	
Emergency Access (Factor 6)	○	
Loading Impacts (Factor 7)	○	

Notes:
- ● - Significant and unavoidable
- ◘ - Significant and unavoidable with mitigation
- ◉ - Not significant with mitigation
- ○ - Not significant

Source: CHS Consulting Group, *et al*. 2010.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional traffic. Therefore, transportation impacts would not be different for this variant.

4.1.5 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

Alternative 2 would increase the total amount of development compared to Alternative 1 with an increase in R&D space at HPS of 2,500,000 gft^2 (232,000 gm^2). There would be no football stadium. Alternative 2 would not have game day or other stadium event transportation impacts associated with Alternative 1. Alternative 2 would have the same roadway, transit, bikeway, and Bay Trail improvements proposed with Alternative 1, including the Yosemite Slough bridge; however, the bridge would be narrower than the bridge for Alternative 1, accommodating two 11-ft (3.3-m) wide dedicated BRT lanes, a sidewalk, and a Class I bicycle path with no provision for automobile traffic on game days or any other days. This alternative would have additional roadways to serve the R&D uses at HPS South compared to Alternative 1.

Alternative 2 would generate 3,065 weekday A.M. trips, 3,134 weekday P.M. trips, and 2,585 Sunday P.M. trips. Alternative 2 trips would be greater than Alternative 1 trips.

4.1.5.1 Construction Impacts

Impacts to transportation resources associated with construction activities for Alternative 2 would be comparable to those for Alternative 1 because the construction methods and construction footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1.

4.1.5.1.1 Factor 1: Construction Vehicle Traffic and Roadway Impacts

Construction activities associated with Alternative 2 would be similar to Alternative 1. Depending on the phasing of the additional development, Alternative 2 may result in fewer construction traffic impacts between 2012 and 2017 when the new stadium would have been constructed, and somewhat greater impacts in the years the additional R&D space would be constructed. Development and implementation of **Mitigation 1** (Construction TMP as described for Alternative 1) would help minimize Alternative 2's contribution to cumulative construction-related traffic impacts. Some disruption and increased delays could still occur even with implementation of a construction TMP; therefore, significant construction-related traffic impacts on local and regional roadways are still possible. Localized construction-related traffic impacts would therefore *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

4.1.5.2 Operational Impacts

4.1.5.2.1 Factor 2: Increase in Traffic Volumes

Project Travel Demand Management Plan

Alternative 2 would be similar to Alternative 1, except that instead of a new football stadium, which generates very few weekday peak hour vehicle trips, there would be additional R&D space. The additional R&D space envisioned under Alternative 2 would generate more weekday peak hour vehicular traffic than Alternative 1. As discussed in the Alternative 1 analysis, the final TDM Plan has not yet been formally approved and **Mitigation 2** is proposed so that the final TDM Plan would be prepared and implemented.

With implementation of the **Mitigation 2**, alternative modes would be encouraged, the use of single-occupant vehicles would be discouraged, and the impact of additional vehicles generated by Alternative 2 would be lessened. However, Alternative 2 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. The Alternative 2 and Alternative 2's contribution to traffic would *remain significant and unavoidable* with mitigation.

Intersection Traffic Impacts

The study intersections that would require mitigation or have significant and unavoidable impacts due to the increase in traffic volumes with implementation of Alternative 1 would also apply to Alternative 2. Section 4.1.3.2, Operational Impacts, discusses traffic effects of those intersections and the feasibility of mitigation measures. The intersection LOS is shown in Table 4.1.5-1. Figure 4.1.5-1 shows the weekday A.M./P.M. peak hour intersection volumes, and Figure 4.1.5-2 shows the Sunday P.M. peak hour volumes.

Table 4.1.5-1. Intersection LOS – 2030 Baseline and Alternative 2 Conditions

Intersection		*Peak*	*2030 Baseline*		*Alternative 2*			
			LOS[a]	**Delay/ v/c[b]**	**LOS**	**Delay/ v/c**	**Percent[c]**	**Impact**
City and County of San Francisco Streets								
#1002	Third St/Cesar Chavez St	A.M.	**F**	**>80/1.49**	**F**	**>80/1.70**	**12.9**	●
		P.M.	**F**	**>80/1.45**	**F**	**>80/1.82**	**12.2**	●
		Sun	C	29.2	**F**	**>80/0.80**	**--**	● PI
#1003	Third St/Cargo Way	A.M.	**F**	**>80/1.21**	**F**	**>80/1.98**	**14.6**	●
		P.M.	**F**	**>80/1.23**	**F**	**>80/1.83**	**13.4**	●
		Sun	C	29.2	D	36.2	--	○
#1004	Third St/Evans Ave	A.M.	**F**	**>80/1.13**	**F**	**>80/1.59**	**18.4**	●
		P.M.	**F**	**>80/1.18**	**F**	**>80/1.59**	**15.6**	●
		Sun	**E**	44.0	**E**	**63.3/0.92**	--	● PI
#1006	Third St/Palou Ave	A.M.	F	54.9	**F**	**>80/2.22**	--	● PI
		P.M.	**F**	**>80/1.51**	**F**	**>80/5.97**	**15.5**	●
		Sun	**E**	**75.5/0.67**	**F**	**>80/4.03**	**18.4**	●
#1008	Third St/Carroll Ave	A.M.	B	11.0	C	22.3	--	○
		P.M.	B	13.4	**E**	**78.3/0.95**	--	● PI
		Sun	B	10.2	**E**	**69.7/0.66**	**--**	● PI

Table 4.1.5-1. Intersection LOS – 2030 Baseline and Alternative 2 Conditions

Intersection		***Peak***	***2030 Baseline***		***Alternative 2***			
			LOS[a]	**Delay/ v/c**[b]	**LOS**	**Delay/ v/c**	**Percent**[c]	**Impact**
#1009	Third St/Paul Ave/Gilman Ave	A.M.	**F**	**>80/1.15**	**F**	**>80/2.02**	**6.4**	●
		P.M.	**F**	**>80/1.27**	**F**	**>80/3.40**	**5.6**	●
		Sun	**E**	**62.8/0.71**	**F**	**>80/1.84**	**6.1**	●
#1016	Evans Ave/Cesar Chavez St	A.M.	**F**	**>80/1.85**	**F**	**>80/1.96**	**10.2**	●
		P.M.	**F**	**>80/1.78**	**F**	**>80/1.86**	**8.4**	●
		Sun	B	16.9	B	19.5	--	○
#1048	Jennings St/Middle Point Rd/Evans Ave	A.M.	**C**	22.9	**E**	**61.4/1.17**	--	● PI
		P.M.	**C**	29.1	D	42.7	--	--
		Sun	B	19.7	C	20.5	--	--
#1058	Evans Ave/Napoleon St/Toland St	A.M.	**F**	**>80/1.12**	**F**	**>80/1.53**	**10.4**	●
		P.M.	**F**	**>80/1.48**	**F**	**>80/1.65**	**8.3**	●
		Sun	**E**	**57.3/0.48**	**E**	**59.6/0.58**	**10.6**	●
Hunters Point Shipyard Streets								
#110	Innes Ave/Donahue St	A.M.	B	14.5	B	17.0	--	○
		P.M.	B	14.7	A	8.2	--	○
		Sun	B	15.2	A	8.3	--	○
#111	Donahue St/Galvez Ave	A.M.	A	8.7	**E (WBL)**	**35.1/(0.53)**	--	○
		P.M.	A	8.8	**E (WBL)**	**42.0/(0.74)**	--	○
		Sun	A	8.7	B	13.5	--	○
#112	Donahue St/Lockwood St	A.M.	A	8.5	A	9.5	--	○
		P.M.	A	8.5	B	10.3	--	○
		Sun	A	8.5	A	9.1	--	○
#113	Crisp Rd/I St (Outer Ring Rd)	A.M.			D	24.5	--	○
		P.M.		Proposed Intersection	C	19.6	--	○
		Sun		Proposed Intersection	C	22.5	--	○
#114	Crisp Rd/Spear St (Inner Ring Rd)	A.M.	A	7.4	C	23.4	--	○
		P.M.	A	7.4	C	18.6	--	○
		Sun	A	7.4	C	18.8	--	○
#115	Robinson St/Spear AveRobinson St/Spear Ave	A.M.		Proposed Intersection	**F (SBL+ SBT)**	**>50/(2.97/1.72)**	**--**	⦿ PI
		P.M.		Proposed Intersection	**F (SBL + SBT)**	**>50/(5.24/1.73)**	**--**	⦿ PI
		Sun			D	26.7	--	○
#116	Lockwood St/Spear Ave	A.M.	A	8.4	**F (SBL)**	**>50/(1.42)**	**--**	⦿ PI
		P.M.	A	8.5	**E (SBL)**	**35.4/(0.27)**	**--**	⦿ PI
		Sun	A	8.4	B	10.6	--	○

Notes:

LOS – level of service; A.M. – A.M. Peak; P.M. – P.M. peak; Sun – Sunday Peak; NBL – northbound left turn; SBL – southbound left turn; SBT – southbound through; EBL – eastbound left turn; WBL – westbound left turn; NSC – no significant contribution; PI – project impact.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

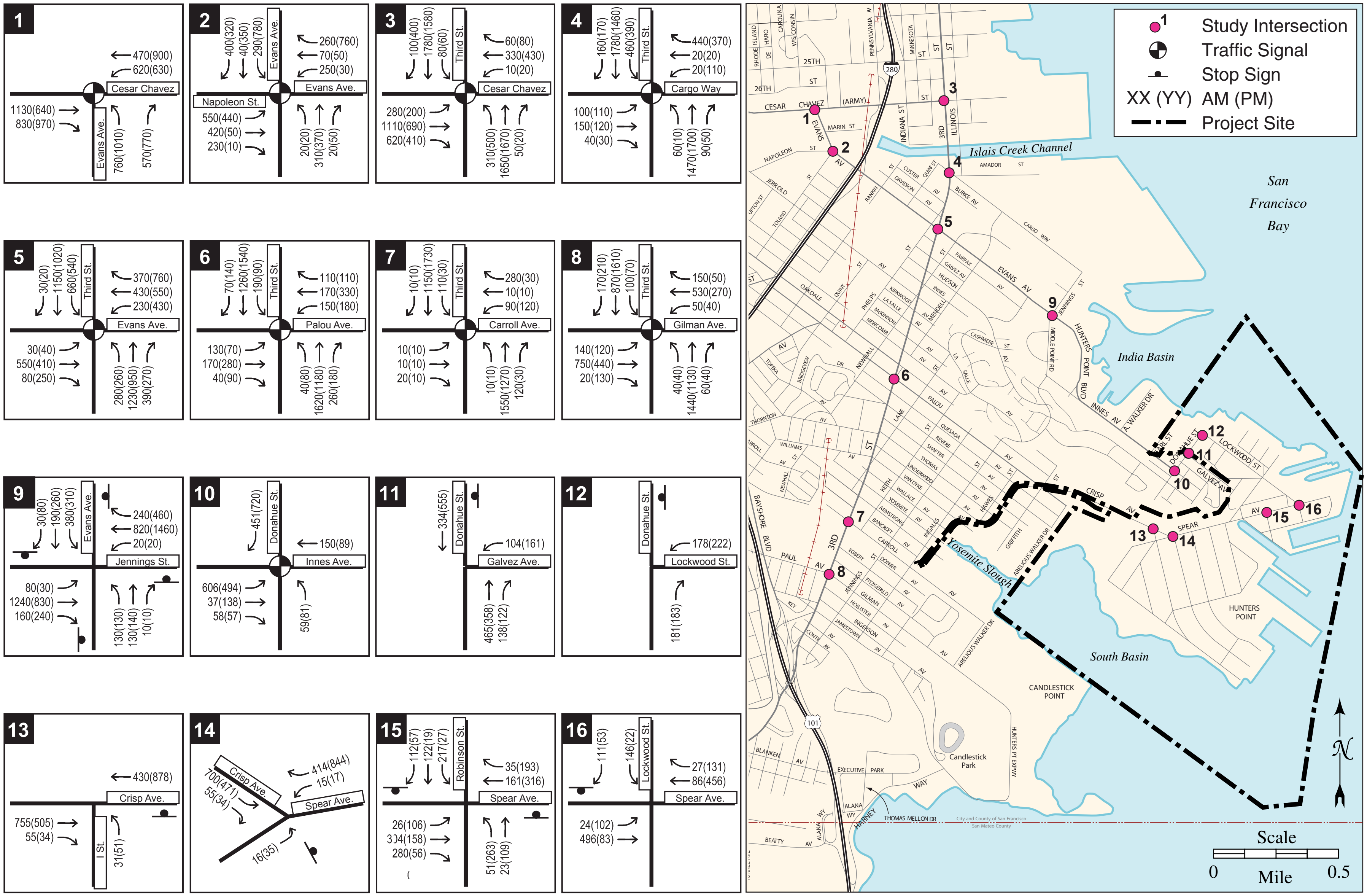
a. Intersections operating at LOS E or LOS F conditions highlighted in bold.

b. Delay in seconds per vehicle and overall intersection volume-to-capacity (v/c) ratio is presented where intersections operating at LOS E or LOS F conditions. For side street STOP-controlled intersections, delay and LOS presented for worst approach.

c. Percent contribution of project traffic.

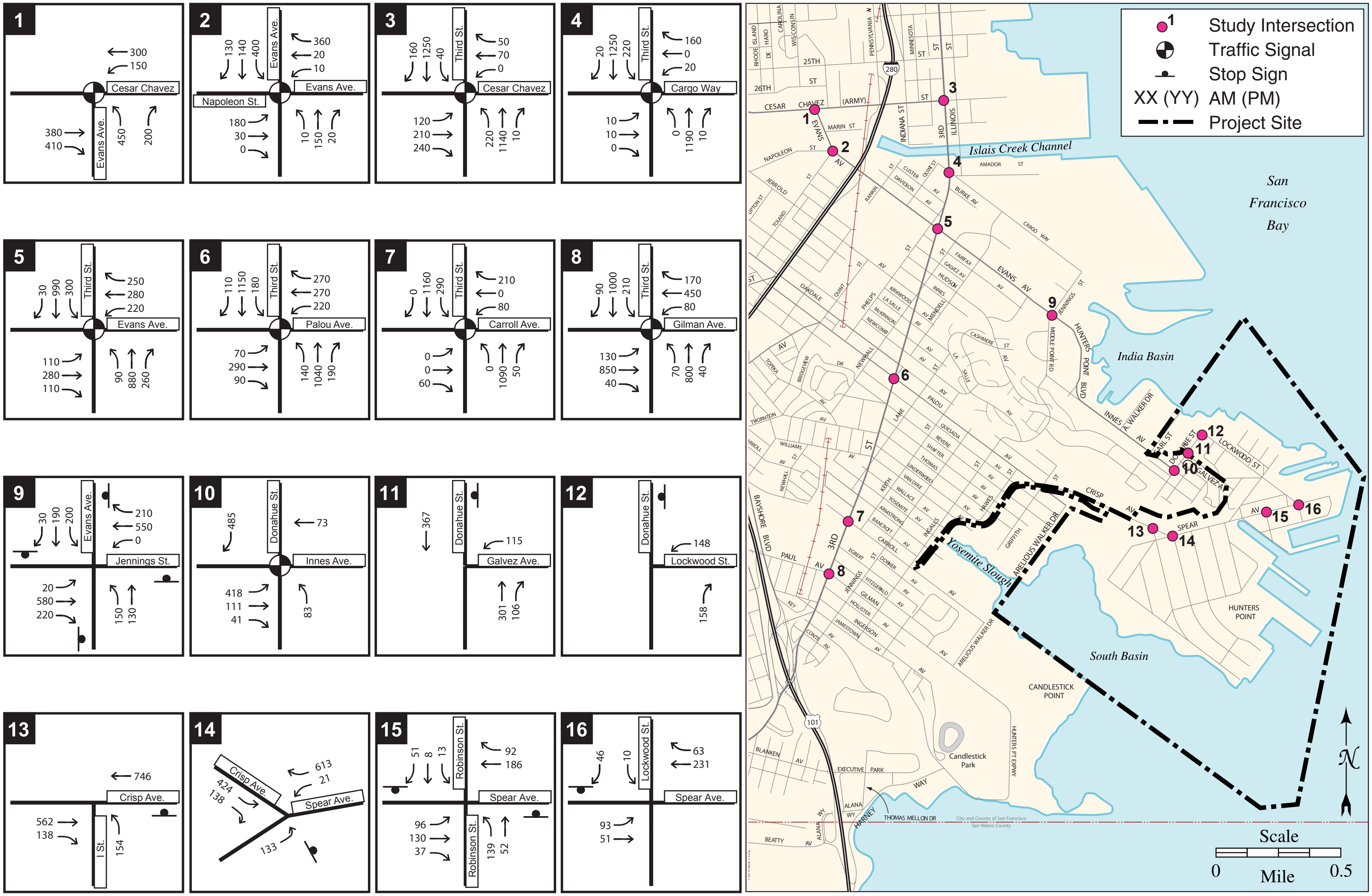
d. Significant cumulative and project impacts are presented, and the project impact is distinguished by using the "PI" designation.

Sources: CHS Consulting Group, *et al*. 2010; CHS Consulting Group, *et al*. 2009.



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.5-1. Weekday A.M. and P.M. Peak Hour Traffic Volumes - Alternative 2



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.5-2. Sunday P.M. Peak Hour Traffic Volumes - Alternative 2

INTERSECTIONS WITH NOT SIGNIFICANT IMPACTS

The following intersections are expected to operate at acceptable levels of service; therefore, the impacts would be *not significant* and no mitigation is proposed.

#110 Innes Ave/Donahue St;

#112 Donahue St/Lockwood St;

#113 Crisp Rd/I St (Outer Ring Rd); and

#114 Crisp Rd/Spear St (Inner Ring Rd).

INTERSECTIONS WITH PROJECT AND CUMULATIVE TRAFFIC IMPACTS

The results show that the following study intersections are projected to operate at unacceptable levels with Alternative 2 and would result in project-specific impacts or would contribute to significant cumulative impacts during at least one peak hour.

#1002 Third St/Cesar Chavez St – project and cumulative *(significant and unavoidable);*

#1003 Third St/Cargo Way – project and cumulative *(significant and unavoidable);*

#1004 Third St/Evans Ave – project and cumulative *(significant and unavoidable);*

#1006 Third St/Palou Ave – project and cumulative *(significant and unavoidable);*

#1008 Third St/Carroll Ave – project-specific *(significant and unavoidable);*

#1009 Third St/Paul Ave/Gilman Ave – project and cumulative (*significant and unavoidable);*

#1016 Evans Ave/Cesar Chavez St – project and cumulative (*significant and unavoidable);*

#1048 Jennings St/Middle Point Rd/Evans Ave – project-specific *(significant and unavoidable);*

#1058 Evans Ave/Napoleon St/Toland St – project and cumulative *(significant and unavoidable);*

#111 Donahue St/Galvez Ave – project-specific *(significant and mitigable);*

#115 Robinson St/Spear Ave – project-specific *(significant and mitigable);* and

#116 Lockwood St/Spear Ave – project-specific *(significant and mitigable).*

At intersections that would operate at LOS E or LOS F under 2030 baseline conditions and would continue to operate at LOS E or LOS F under 2030 cumulative conditions, the increase in vehicle trips from 2030 baseline conditions caused by the Alternative 2 was determined to be significant and no feasible mitigation measures were identified for intersections described as “project and cumulative *(significant and unavoidable)*” in the list above.

Possible mitigation measures associated with these intersections are included with the Alternative 1 analysis. The Alternative 1 analysis concluded that due to issues related to acquisition of additional right-of-way, mitigation was infeasible, which would also apply to the intersection of Jennings St/Middle Point Rd/Evans Ave. Therefore, Alternative 2 traffic impacts and contribution to cumulative impacts at these study intersections would *remain significant and unavoidable*.

The intersection of Donahue St/Galvez Ave (#111) is proposed as a side street STOP-controlled intersection with movements along Donahue St uncontrolled and movements on Galvez Ave controlled by a STOP sign. Under Alternative 2, operating conditions would degrade from an acceptable LOS to LOS E during the weekday A.M. and P.M. peak periods, and traffic signal warrants would be met. The poor level of service would primarily be due to the delay that would be experienced by the STOP - controlled movements on Galvez Ave approaches. Implementation of **Mitigation 11** would minimize Alternative 2 transportation impacts at the Donahue St/Galvez Ave intersection to *not significant with mitigation*.

The intersection of Robinson St/Spear Ave (#115) would operate at an unacceptable LOS under Alternative 2. As described above (see Section 4.1.3.3.1, Increase in Traffic Volumes), implementation of **Mitigation 3** would minimize Alternative 2 transportation impacts. Therefore, traffic impacts at the intersection of Robinson Street/Spear Avenue would be *not significant with mitigation*.

The intersection of Lockwood St/Spear Ave (#116) is proposed as a side street STO-controlled intersection with movements along Spear Ave uncontrolled and movements on Lockwood St controlled by a STOP sign. Under Alternative 2, operating conditions would degrade from an acceptable LOS to LOS F and LOS E during the weekday A.M. and P.M. peak periods, respectively, and traffic signal warrants would be met. The poor level of service is primarily due to the delay that would be experienced by the stop-controlled movements on Lockwood St approaches. Implementation of **Mitigation 12** would minimize Alternative 2 transportation impacts at the Lockwood St/Spear Ave intersection to *not significant with mitigation*.

Mitigation Measure

Mitigation 11. Install a traffic signal at the intersection of Donahue St/Galvez Ave.

The future developer or owner of the property would install a traffic signal at the intersection of Donahue St/Galvez Ave to minimize impacts of Alternative 2 and improve operating conditions to acceptable levels of LOS D or better.

Implementation of this mitigation would be the responsibility of the future developer or owner of the property. Installation of a traffic signal at the intersection of Donahue St/Galvez Ave would improve intersection operations to LOS D or better. Traffic forecasts show that this intersection would be very close to meeting peak hour traffic signal warrants with buildout of Alternative 2. The future developer or owner of the property, in collaboration with the city, would monitor traffic volumes at completion of each phase of construction to determine whether the intersection volumes would actually warrant a traffic signal and when it would be implemented. The SFMTA and DPW would design and implement the measure as necessary. The City and County of San Francisco and SFMTA would be responsible for the enforcement of the mitigation, and the City and County of San Francisco, SFMTA, and the Planning Department would be responsible for the compliance monitoring. The monitoring program would be completed upon installation of the traffic signal.

Mitigation 12. Install a traffic signal at the intersection of Lockwood St/Spear Ave.

The future developer or owner of the property would install a traffic signal at the intersection of Lockwood St/Spear Ave to minimize impacts of Alternative 2 and improve operating conditions to acceptable levels of LOS D or better.

Implementation of this mitigation would be the responsibility of the future developer or owner of the property. Installation of a traffic signal at the intersection of Lockwood St/Spear Ave would improve intersection operations to LOS D or better. Traffic forecasts show that this intersection would be very close to meeting peak hour traffic signal warrants with build-out of Alternative 2. The future developer or owner of the property, in collaboration with the city, would monitor traffic volumes at completion of each phase of construction to determine whether the intersection volumes would actually warrant a traffic signal and when it would be implemented. The SFMTA and DPW would design and implement the measure as necessary. The City and County of San Francisco and SFMTA would be responsible for the enforcement of the mitigation, and the City and County of San Francisco, SFMTA, and the Planning Department would be responsible for the compliance monitoring. The monitoring program would be completed upon installation of the traffic signal.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 2 would not be different for these variants.

Freeway Traffic Impacts

FREEWAY SEGMENT IMPACTS

Alternative 2 would create impacts at similar freeway mainline sections and freeway ramp junctions to Alternative 1, although the magnitude of impacts may be greater with Alternative 2 due to increased traffic generation compared to Alternative 1, as discussed in Section 4.1.3.3.1, Increase in Traffic Volumes.

Table 4.1.5-2 presents the results of the mainline LOS analysis and summarizes the mainline segment impacts for 2030 baseline and Alternative 2 conditions. In some cases, the mainline segments operate at acceptable levels with the addition of project traffic during a specific peak periods. The increase in traffic due to Alternative 2 would result in increases in traffic volumes on the freeway segments that would cause the operations on all the study area freeway segments to deteriorate from the already LOS F conditions; however, the percent contribution of Alternative 2 traffic is not considered significant and does not significantly contribute to the traffic impacts. Because impacts would be *not significant*, no mitigation is proposed.

Table 4.1.5-2. Mainline Segment LOS and Segment Impacts – 2030 Baseline and Alternative 2 Conditions

Ramp Location	Peak Hour	2030 Baseline		Alternative 2			
		LOS	Density[a]	LOS	Density	Percent[b]	Impact
US-101, the SF County Line NB	A.M.	**F**	**>45**	**F**	**>45**	2.7	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.1	○ NSC
	Sun	D	30.3	D	32.3	--	○
US-101, the SF County Line SB	A.M.	**F**	**>45**	**F**	**>45**	0.8	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.8	○ NSC
	Sun	D	31.8	D	34.5	--	○
SF/Oakland Bay Bridge EB	A.M.	**F**	**>45**	**F**	**>45**	1.5	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	3.4	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	1.9	○ NSC
SF/Oakland Bay Bridge WB	A.M.	**F**	**>45**	**F**	**>45**	1.8	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0.8	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	0.9	○ NSC
I-280, south of US-101 NB	A.M.	**F**	**>45**	**F**	**>45**	1.4	○ NSC
	P.M.	D	33.2	D	33.3	--	○
	Sun	C	21.6	C	21.6	--	○
I-280, south of US-101 SB	A.M.	D	34.4	D	34.6	--	○
	P.M.	**F**	**>45**	**F**	**>45**	1.2	○ NSC
	Sun	D	29.5	D	29.5	--	○

Notes:
SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution.
● - Significant and unavoidable (no feasible mitigation)
◉ - Significant and mitigable (not significant with mitigation)
○ - Not significant
a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.
b. Percent contribution of project traffic.
Source: CHS Consulting Group, *et al*. 2010.

Freeway Ramp Impacts

Alternative 2 would create similar significant traffic impacts to freeway ramp junctions as Alternative 1. Table 4.1.5-3 presents the results of the ramp junction merge (on-ramp) and diverge (off-ramp) analysis and summarizes the impacts for 2030 baseline and Alternative 2 conditions. As described in the discussion of Alternative 1 impacts in Section 4.1.3.3.1, Increase in Traffic Volumes, no feasible mitigation measures have been identified for the freeway ramp junctions expected to experience significant impacts under Alternative 1 conditions. Therefore, traffic impacts at the freeway ramp junctions under Alternative 2 would *remain significant and unavoidable*.

Table 4.1.5-3. Ramp Junction LOS and Segment Impacts – 2030 Baseline and Alternative 2 Conditions

Ramp Location	Peak Hour	2030 Baseline		Alternative 2			
		LOS	Density[a]	LOS	Density	Percent[b]	Impact
US-101 NB Off to Third St/Bayshore Blvd	A.M.	D	31.3	D	32.2	--	○
	P.M.	**E**	**35.5**	**E**	**37.4**	**9.8**	●
	Sun	C	22.8	C	24.0	--	○
US-101 NB On from Third St/Bayshore Blvd	A.M.	C	22.3	C	24.4	--	○
	P.M.	C	27.9	D	30.0	--	○
	Sun	C	21.9	C	22.4	--	○
US-101 NB Off to Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	4.3	○ NSC
	P.M.	**E**	**39.4**	**E**	**40.8**	0.7	○ NSC
	Sun	D	29.7	D	30.6	--	○
US-101 NB On from Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	2.4	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	**8.9**	●
	Sun	D	31.4	**F**	**>45**	**8.3**	●
US-101 SB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	**7.8**	●
	P.M.	**F**	**>45**	**F**	**>45**	2.9	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	**6.5**	●
US-101 SB Off to Bayshore Blvd/Third St	A.M.	**E**	**34.7**	**E**	**41.9**	0	○ NSC
	P.M.	**E**	**31.2**	**E**	**37.3**	0	○ NSC
	Sun	C	22.4	C	25.1	--	○
US-101 SB On from Bayshore Blvd/Third St	A.M.	**F**	**>45**	**F**	**>45**	**9.2**	●
	P.M.	**F**	**>45**	**F**	**>45**	**14.9**	●
	Sun	C	23.7	C	26.1	--	○
I-280 NB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	Sun	C	26.0	C	26.0	--	○
I-280 NB On from Indiana St	A.M.	**F**	**>45**	**F**	**>45**	**8.6**	●
	P.M.	**F**	**>45**	**F**	**>45**	**20.3**	●
	Sun	C	25.2	C	26.2	--	○
I-280 SB Off to Pennsylvania Ave	A.M.	**E**	**36.3**	**E**	**37.5**	**26.3**	●
	P.M.	**F**	**>45**	**F**	**>45**	**8.9**	●
	Sun	D	30.6	D	31.1	--	○

Notes:

SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.

b. Percent contribution of project traffic.

Source: CHS Consulting Group *et al*. 2010

Significant and unavoidable impacts are associated with Factor 2 (Increased Traffic Volumes) for intersection levels of service and freeway ramps. **Mitigations 3, 11, and 12** would reduce impacts at the intersections of Donahue St/Galvez Ave, Robinson St/Spear Ave, and Lockwood St/Spear Ave to less than significant. Nevertheless, overall impacts of Alternative 2 related to traffic volume would be *significant and unavoidable.*

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

4.1.5.2.2 Factor 3: Transit Impacts

The transit impact analysis performed for Alternative 1 (see Section 4.1.3.3.2, Transit Impacts) would also apply to Alternative 2 conditions. Therefore, the same impacts and mitigation measures would apply.

Final Transit Plan

As discussed in Alternative 1, although there is a plan for increased transit service to the transit study area, **Mitigation 4** requires preparation, approval, and implementation of the final Transit Plan because the final Transit Plan has not been formally approved by SFMTA. With implementation of **Mitigation 4** project impacts on transit capacity would be *not significant with mitigation*.

Ridership and Capacity Utilization at Study Area Cordons

The Alternative 1 transit capacity analysis is representative of Alternative 2 (*significant and mitigable*; Section 4.1.3.3.2, Transit Impacts). **Mitigation 4** requires preparation, approval, and implementation of the final Transit Plan. With implementation of **Mitigation 4**, the study area impacts and the proposed action's contribution to cumulative impacts on transit capacity at the study area cordons would be *not significant* with mitigation.

Transit Capacity Utilization at Downtown Screenlines

The capacity utilization for the downtown screenlines for the A.M. and P.M. peak hours for the cumulative conditions are summarized in Section 4.1.3.3.2, Transit Impacts. As discussed in the Alternative 1 analysis, impacts on transit capacity at the downtown screenlines would be *not significant*.

Transit Capacity and Utilization at Regional Screenlines

The capacity utilization for the regional transit provider screenlines for the A.M. and P.M. peak hours for existing, 2030 baseline, and 2030 cumulative conditions are summarized in Section 4.1.3.3.2, Transit Impacts. As discussed in the Alternative 1 analysis, the cumulative impacts and the proposed action contribution to cumulative impacts on regional transit capacity would be *not significant*.

Transit Operations Impacts

During the A.M. peak hour, Alternative 2 would require additional transit vehicles on the same routes as Alternative 1. During the P.M. peak hour, Alternative 2 would require additional vehicles on the same routes as Alternative 1, except that Alternative 2 would also require additional vehicles on the 48-Quntara-24th St route. Impacts associated with Alternative 2 would be somewhat more extensive than those for Alternative 1. Alternative 2 would require 10 additional vehicles in the A.M. peak hour, and 15 additional vehicles in the P.M. peak hour. As for Alternative 1, these transit vehicles would be in addition to those identified to maintain 2030 baseline conditions (16 vehicles in the A.M. peak hour and 16 vehicles in the P.M. peak hour). **Mitigation 5 and 6** would also apply to Alternative 2. Because a feasibility study of the improvements contemplated in **Mitigation 5** would be required, implementation of **Mitigation 5** is uncertain. Since implementation of **Mitigation 6** alone, without **Mitigation 5**, might not be sufficient to reduce the impacts to a not significant level, the project impacts would remain *significant and unavoidable with mitigation*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

4.1.5.2.3 Factor 4: Bicycle Network and Circulation

Alternative 2 bicycle trips would be accommodated within the proposed street network for this alternative which would improve bicycle routes and access within the new development and thereby improve the bicycle network and circulation in the vicinity. See the Alternative 1 discussion of bicycle network and circulation impacts in operational impacts of Section 4.1.3.2.4, Bicycle Network and Circulation. Operational impacts associated with Factor 4 would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or affect bicycle access. Therefore, transportation impacts associated with Factor 4 would not be different for these variants.

4.1.5.2.4 Factor 5: Pedestrian Circulation

Alternative 2 would improve sidewalks and the pedestrian network in the vicinity by ensuring adequate sidewalk widths and facilitating pedestrian circulation in areas not now served by such facilities. See the Alternative 1 discussion of Pedestrian Circulation impacts in Section 4.1.3.2.5, Pedestrian Circulation. Overall, impacts on pedestrian circulation associated with Factor 5 would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect pedestrian circulation. Therefore, transportation impacts associated with Factor 5 would not be different for these variants.

4.1.5.2.5 Factor 6: Emergency Access

Alternative 2 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. 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), and emergency vehicles would be able to utilize transit lanes when streets are congested. Therefore, the impacts of Alternative 2 on emergency access associated with Factor 6 would be *not significant*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for these variants.

4.1.5.2.6 Factor 7: Loading Impacts

The loading impacts assessment associated with Alternative 2 would be similar to the assessment completed for Alternative 1 (see Section 4.1.3.3.6, Loading Impacts). The proposed action would establish a minimum number of loading spaces; more could be provided as part of individual development projects. Table 4.1.5-4 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. Within HPS, the loading demand and estimated supply would be similar. Impacts related to loading operations with Alternative 2 would be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

Table 4.1.5-4. Summary of Alternative 2 Loading Demand and Supply

Project Site Area	*Daily Truck Generation*	*Peak Hour Loading Dock Space Demand*	*Supply*[a, b]
Hunters Point Shipyard	1,238	72	67

Notes:
a. Minimum number of loading spaces permitted per draft Design for Development standard for *CP-HPS Phase II Development Plan*.
b. Does not include stadium loading facilities.
Source: CHS Consulting Group, *et al*. 2009.

4.1.6 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

Impacts to transportation from operation of Alternative 2A would be similar to those discussed for Alternative 1 (Section 4.1.3.1.2).

Alternative 2A would not increase the total amount of development compared to Alternative 1 but would relocate approximately 1,625 housing units from Candlestick Point to HPS and increase R&D by 500,000 ft^2 (46,500 m^2). Therefore, 4,275 residential units (rather than 2,650 residential units) and 3,000,000 ft^2 (280,000 m^2) of R&D space would be developed at HPS. Alternative 2A would include all uses proposed with Alternative 1 with the exception of the stadium. Without a stadium, Alternative 2A would not have the game day or other stadium event transportation impacts associated with Alternative 1. Alternative 2A would have the same arena-related transportation effects as with Alternative 1. Alternative 2A would have the same roadway, transit, bikeway, and Bay Trail improvements proposed with Alternative 1, including the Yosemite Slough bridge; however, the bridge would be narrower than the bridge with Alternative 1.

Alternative 2A would generate 2,324 weekday A.M. trips, 2,628 weekday P.M. trips, and 1,894 Sunday P.M. trips. Alternative 2A trips would be slightly greater than Alternative 1 trips.

4.1.6.1 Construction Impacts

Impacts to transportation resources associated with construction activities for Alternative 2A would be comparable to those for Alternative 1 because the construction methods and construction footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1.

4.1.6.1.1 Factor 1: Construction Vehicle Traffic and Roadway Impacts

Construction activities associated with Alternative 2A would be similar to those described for Alternative 1. Depending on the phasing of the additional development, Alternative 2A may result in fewer construction traffic impacts between 2012 and 2017 when the new stadium would have been constructed, and somewhat greater impacts in the years the additional housing would be constructed. Development and implementation of **Mitigation 1** (Construction TMP as described for Alternative 1) would help minimize the Alternative 2A contribution to cumulative construction-related traffic impacts. Some disruption and increased delays would still occur even with implementation of a construction TMP; therefore, significant construction-related traffic impacts on local and regional roadways would still be possible. Localized construction-related traffic impacts would therefore *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

4.1.6.2 Operational Impacts

4.1.6.2.1 Factor 2: Increase in Traffic Volumes

Project Travel Demand Management Plan

Alternative 2A would be similar to Alternative 1, except that instead of a new football stadium, which would generate very few weekday peak hour vehicle trips, there would be additional housing. The additional housing envisioned under Alternative 2A would generate weekday peak hour vehicular traffic similar to Alternative 1. As discussed in the Alternative 1 analysis, the final TDM Plan has not yet been formally approved, and **Mitigation 2** is required so that the final TDM Plan would be prepared and implemented.

With implementation of **Mitigation 2**, alternative modes would be encouraged, the use of single-occupant vehicles would be discouraged, and the impact of additional vehicles generated by Alternative 2A would be lessened. However, Alternative 2A would still result in significant and unavoidable impacts on traffic and transit operations and would still make considerable contributions to cumulative impacts due to substantial increases in traffic. The proposed action's contribution to traffic would *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 2 would not be different for these variants.

Intersection Traffic Impacts

The study intersections that would require mitigation or have significant and unavoidable impacts due to the increase in traffic volumes with implementation of Alternative 1 would also apply to Alternative 2A. Section 4.1.3.3.1, Increase in Traffic Volumes, discusses traffic effects of those intersections and the feasibility of mitigation measures. The intersection LOS is shown in Table 4.1.6-1. Figure 4.1.6-1 shows the weekday A.M./P.M. peak hour intersection volumes, and Figure 4.1.6-2 shows the Sunday P.M. peak hour volumes.

Table 4.1.6-1. Intersection LOS – 2030 Baseline and Alternative 2A Conditions

Intersection		*Peak Hour*	*2030 Baseline*		*Alternative 2A*			
			LOS[a]	**Delay/ v/c[b]**	**LOS**	**Delay/ v/c**	**Percent[c]**	**Impact**
City and County of San Francisco Streets								
#1002	Third St/Cesar Chavez St	A.M.	**F**	**>80/1.49**	**F**	**>80/1.65**	**9.8**	●
		P.M.	**F**	**>80/1.45**	**F**	**>80/1.77**	**10.4**	●
		Sun	C	29.2	**F**	**>80/0.78**	**--**	● PI
#1003	Third St/Cargo Way	A.M.	**F**	**>80/1.21**	**F**	**>80/1.92**	**11.3**	●
		P.M.	**F**	**>80/1.23**	**F**	**>80/1.77**	**11.6**	●
		Sun	C	29.2	D	33.9	--	○
#1004	Third St/Evans Ave	A.M.	**F**	**>80/1.13**	**F**	**>80/1.48**	**14.8**	●
		P.M.	**F**	**>80/1.18**	**F**	**>80/1.61**	**14.1**	●
		Sun	D	44.0	**E**	**69.0/0.93**	**--**	● PI
#1006	Third St/Palou Ave	A.M.	D	54.9	**F**	**>80/2.13**	--	● PI
		P.M.	**F**	**>80/1.51**	**F**	**>80/6.01**	**14.3**	●
		Sun	**E**	**75.5/0.67**	**F**	**>80/2.92**	**18.5**	●

Table 4.1.6-1. Intersection LOS – 2030 Baseline and Alternative 2A Conditions

Intersection		Peak Hour	*2030 Baseline*		*Alternative 2A*			
			LOS[a]	Delay/ v/c[b]	LOS	Delay/ v/c	Percent[c]	Impact
#1008	Third St/Carroll Ave	A.M.	B	11.0	B	18.2	--	○
		P.M.	B	13.4	**E**	**62.7/0.92**	--	● PI
		Sun	B	10.2	**E**	**55.5/0.64**	**--**	● PI
#1009	Third St/Paul Ave/Gilman Ave	A.M.	**F**	**>80/1.15**	**F**	**>80/1.88**	**5.6**	●
		P.M.	**F**	**>80/1.27**	**F**	**>80/3.41**	**5.3**	●
		Sun	**E**	**62.8/0.71**	**F**	**>80/1.82**	**6.2**	●
#1016	Evans Ave/Cesar Chavez St	A.M.	**F**	**>80/1.85**	**F**	**>80/1.93**	**7.9**	●
		P.M.	**F**	**>80/1.78**	**F**	**>80/1.85**	**7.4**	●
		Sun	B	16.9	B	19.3	--	○
#1048	Jennings St/Middle Point Rd/Evans Ave	A.M.	C	22.9	C	34.7	--	○
		P.M.	C	29.1	D	38.2	--	○
		Sun	B	19.7	C	20.3	--	○
#1058	Evans Ave/Napoleon St/Toland St	A.M.	**F**	**>80/1.12**	**F**	**>80/1.51**	**8.4**	●
		P.M.	**F**	**>80/1.48**	**F**	**>80/1.63**	**7.6**	●
		Sun	**E**	**57.3/0.48**	**E**	**59.8/0.58**	**12.4**	●
Hunters Point Shipyard Streets								
#110	Innes Ave/Donahue St	A.M.	B	14.5	A	9.4	--	○
		P.M.	B	14.7	A	7.6	--	○
		Sun	B	15.2	A	7.8	--	○
#111	Donahue St/Galvez Ave	A.M.	A	8.7	C	21.6	--	○
		P.M.	A	8.8	C	26.2	--	○
		Sun	A	8.7	B	13.9	--	○
#112	Donahue St/Lockwood St	A.M.	A	8.5	A	9.8	--	○
		P.M.	A	8.5	A	9.8	--	○
		Sun	A	8.5	A	9.1	--	○
#113	Crisp Rd/I St (Outer Ring Rd)	A.M.	Proposed Intersection		C	17.0	--	○
		P.M.			C	19.4	--	○
		Sun			C	20.5	--	○
#114	Crisp Rd/Spear St (Inner Ring Rd)	A.M.	A	7.4	C	16.2	--	○
		P.M.	A	7.4	C	18.1	--	○
		Sun	A	7.4	C	16.9	--	○
#115	Robinson St/Spear Ave	A.M.	Proposed Intersection		**F (SBL)**	**>50/0.90**	**--**	⦿ PI
		P.M.			**F (SBL)**	**>50/0.56**	**--**	⦿ PI
		Sun			C	22.3	--	○
#116	Lockwood St/Spear Ave	A.M.	A	8.4	C	21.0	--	○
		P.M.	A	8.5	B	17.2	--	○
		Sun	A	8.4	A	9.7	--	○

Notes:

LOS – level of service; A.M. – A.M. Peak; P.M. – P.M. peak; Sun – Sunday Peak NBL – northbound left turn; SBL – southbound left turn; EBL – eastbound left turn; WBL – westbound left turn; NSC – no significant contribution.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

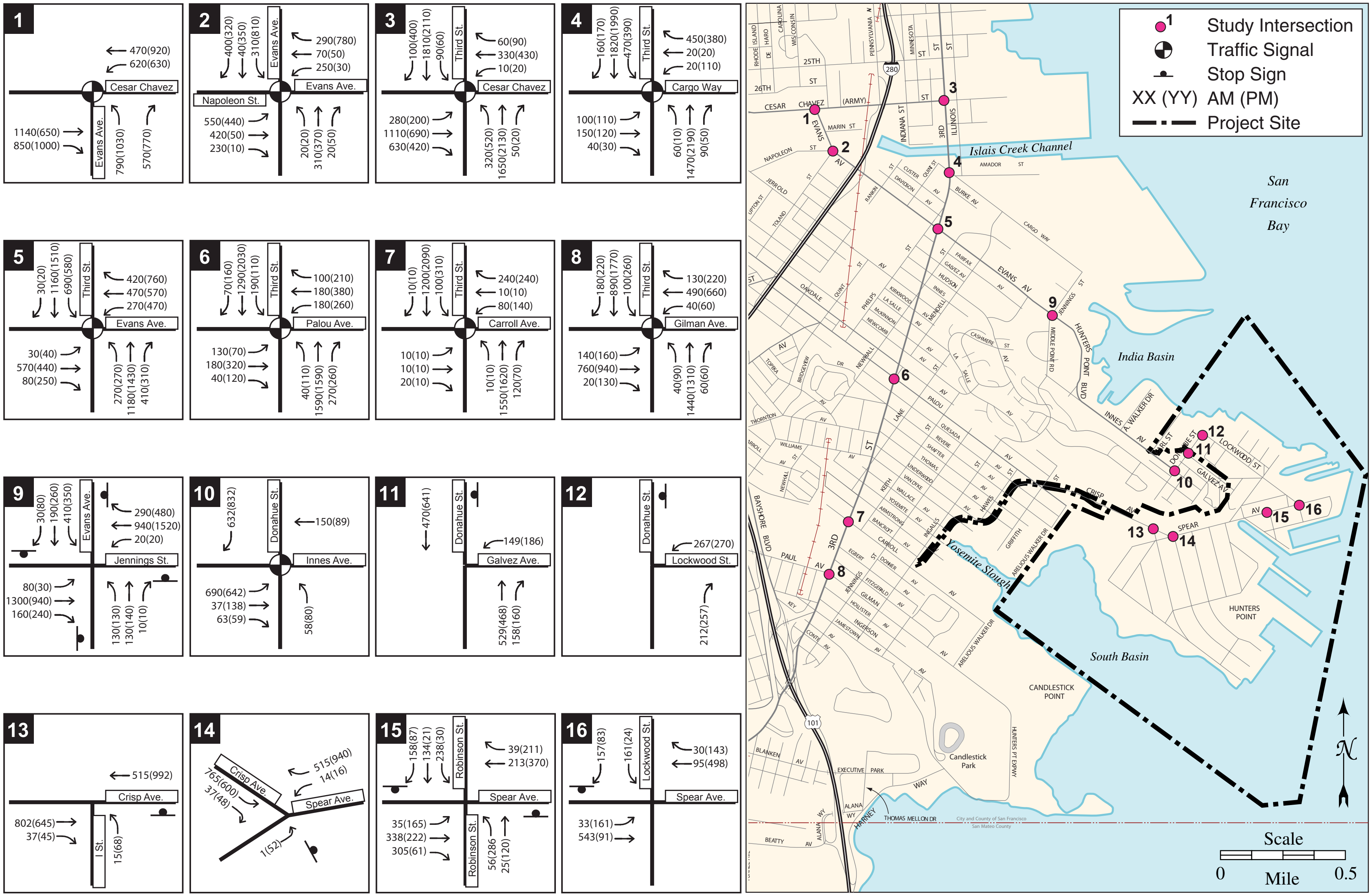
a. Intersections operating at LOS E or LOS F conditions highlighted in bold.

b. Delay in seconds per vehicle and overall intersection volume-to-capacity (v/c) ratio is presented where intersections operating at LOS E or LOS F conditions. For side street STOP-controlled intersections, delay and LOS presented for worst approach.

c. Percent contribution of project traffic.

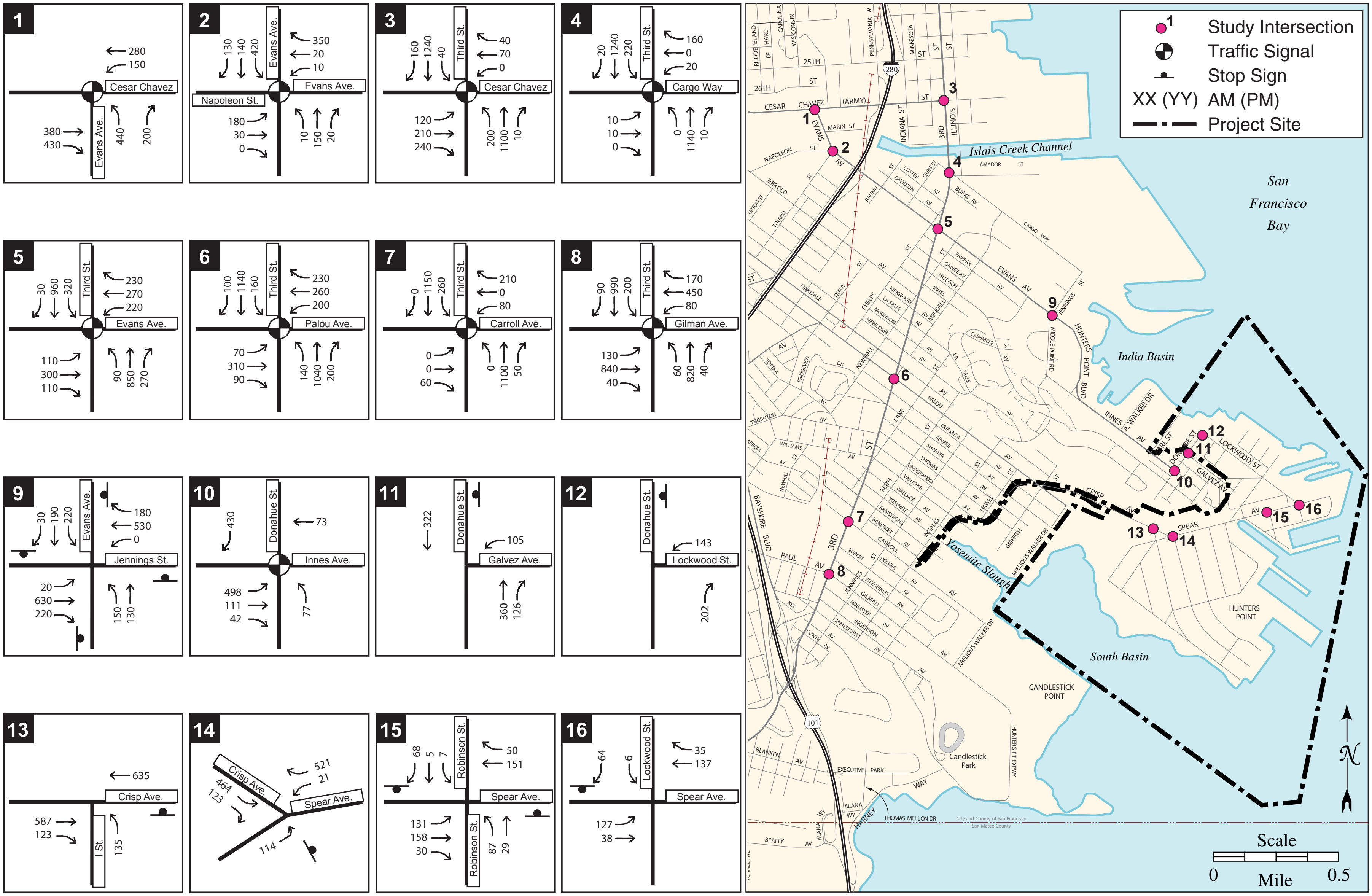
d. Significant cumulative and project impacts are presented, and the project impact is distinguished by using the “PI” designation.

Sources: CHS Consulting Group, *et al*. 2010; CHS Consulting Group, *et al*. 2009.



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.6-1. Weekday A.M. and P.M. Peak Hour Traffic Volumes - Alternative 2A



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.6-2. Sunday A.M. and P.M. Peak Hour Traffic Volumes - Alternative 2A

INTERSECTIONS WITH NOT SIGNIFICANT IMPACTS

Implementation of Alternative 2A would result in *not significant* project and cumulative impacts at some of the study area intersections since they are expected to operate at acceptable levels of service. Therefore, impacts would be *not significant*, and no mitigation is proposed**.**

#1048 Jennings St/Middle Point Rd/Evans Ave;

#110 Innes Ave/Donahue St;

#111 Donahue St/Galvez Ave;

#112 Donahue St/Lockwood St;

#113 Crisp Rd/I St (Outer Ring Rd);

#114 Crisp Rd/Spear St (Inner Ring Rd); and

#116 Lockwood St/Spear Ave.

INTERSECTIONS WITH PROJECT AND CUMULATIVE TRAFFIC IMPACTS

The results show that of the following study intersections are projected to operate at unacceptable levels with Alternative 2A and would result in project-specific impacts or would contribute to significant cumulative impacts during at least one peak hour.

#1002 Third St/Cesar Chavez St – project and cumulative *(significant and unavoidable)*;

#1003 Third St/Cargo Way – project and cumulative (*significant and unavoidable)*;

#1004 Third St/Evans Ave – project and cumulative *(significant and unavoidable)*;

#1006 Third St/Palou Ave – project and cumulative *(significant and unavoidable)*;

#1008 Third St/Carroll Ave – project-specific *(significant and unavoidable)*;

#1009 Third St/Paul Ave/Gilman Ave – project and cumulative (*significant and unavoidable)*;

#1016 Evans Ave/Cesar Chavez St – project and cumulative (*significant and unavoidable)*;

#1058 Evans Ave/Napoleon St/Toland St – project and cumulative *(significant and unavoidable)*; and

#115 Robinson St/Spear Ave – project-specific *(significant and mitigable)*.

At intersections that would operate at LOS E or LOS F under 2030 baseline conditions and would continue to operate at LOS E or LOS F under 2030 cumulative conditions, the increase in vehicle trips from 2030 baseline was reviewed to determine whether the increase would contribute considerably (by five percent or more) to critical movements operating at LOS E or LOS F. Alternative 2A contributions were determined to be *significant* and no feasible mitigation measures were identified for intersections described as "project and cumulative *(significant and unavoidable)*" in the list above.

Discussions on possible mitigation measures associated with these intersections are included with the Alternative 1 analysis (Section 4.1.3.3.1, Increase in Traffic Volumes). The Alternative 1 analysis concluded that due to the issues related to acquisition of additional right-of-way, mitigation was determined to be infeasible. Therefore, Alternative 2A traffic impacts and contribution to cumulative impacts at these locations would *remain significant and unavoidable*.

The intersection of Robinson St/Spear Ave would operate at an unacceptable LOS under Alternative 2A. As described above (see Section 4.1.3.3.1, Increase in Traffic Volumes), implementation of **Mitigation 3** would minimize Alternative 2 transportation impacts. Therefore, traffic impacts at the intersection of Robinson Street/Spear Avenue would be *not significant with mitigation*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 2 as it relates to intersection levels of service would not be different for these variants.

Freeway Segment Impacts

Table 4.1.6-2 presents the results of the mainline LOS analysis and summarizes the mainline segment impacts for 2030 baseline and Alternative 2A conditions. In some cases, the mainline segments operate at acceptable levels with the addition of project traffic during a specific peak periods. The increase in traffic due to Alternative 2A would result in increases in traffic volumes on the freeway segments that would cause the operations on all the study area freeway segments to deteriorate from the already LOS F conditions; however, the percent contribution of Alternative 2A traffic is not considered significant and does not significantly contribute to the traffic impacts. Because impacts would be *not significant*, no mitigation is proposed.

Table 4.1.6-2. Mainline Segment LOS and Segment Impacts – 2030 Baseline and Alternative 2A Conditions

Ramp Location	*Peak Hour*	*2030 Baseline*		*Alternative 2A*			
		LOS	**Density[a]**	**LOS**	**Density**	**Percent[b]**	**Impact**
US-101, the SF County Line NB	A.M.	**F**	**>45**	**F**	**>45**	1.7	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.2	○ NSC
	Sun	D	30.3	D	32.6	--	○
US-101, the SF County Line SB	A.M.	**F**	**>45**	**F**	**>45**	1.0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.5	○ NSC
	Sun	D	31.8	D	34.0	--	○
SF/Oakland Bay Bridge EB	A.M.	**F**	**>45**	**F**	**>45**	1.9	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.6	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	1.0	○ NSC
SF/Oakland Bay Bridge WB	A.M.	**F**	**>45**	**F**	**>45**	1.0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.5	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	0.5	○ NSC
I-280, south of US-101 NB	A.M.	**F**	**>45**	**F**	**>45**	0.8	○ NSC
	P.M.	D	33.2	D	33.3	--	○
	Sun	C	21.6	C	21.6	--	○
I-280, south of US-101 SB	A.M.	D	34.4	D	34.6	--	○
	P.M.	**F**	**>45**	**F**	**>45**	0.9	○ NSC
	Sun	D	29.5	D	29.5	--	○

Notes:

SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.

b. Percent contribution of project traffic.

Sources: CHS Consulting Group, *et al*. 2010; CHS Consulting Group, *et al*. 2009.

Freeway Ramp Impacts

Implementation of Alternative 2A would result in significant impacts at freeway on- and off-ramp locations. Impacts would be significant and unavoidable. Alternative 2A would create similar significant traffic impacts to freeway ramp junctions as Alternative 1. Table 4.1.6-3 presents the results of the ramp junction merge (on-ramp) and diverge (off-ramp) analysis and summarizes the impacts for 2030 baseline and Alternative 2A conditions. As described in the discussion of Alternative 1 impacts in Section 4.1.3.3.1, Increase in Traffic Volumes, no feasible mitigation measures have been identified for the freeway ramp junctions expected to experience significant impacts under Alternative 1 conditions. Therefore, traffic impacts at the freeway ramp junctions under Alternative 2A would remain significant and unavoidable.

Table 4.1.6-3. Ramp Junction LOS and Segment Impacts – 2030 Baseline and Alternative 2A Conditions

Ramp Location	Peak Hour	2030 Baseline		Alternative 2A			
		LOS	Density[a]	LOS	Density	Percent[b]	Impact
US-101 NB Off to Third St/Bayshore Blvd	A.M.	D	31.3	D	32.5	--	○
	P.M.	**E**	**35.5**	**E**	**37.4**	**11.2**	●
	Sun	C	22.8	C	24.1	--	○
US-101 NB On from Third St/Bayshore	A.M.	C	22.3	C	23.5	--	○
	P.M.	C	27.9	D	30.0	--	○
	Sun	C	21.9	C	22.4	--	○
US-101 NB Off to Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	2.5	○ NSC
	P.M.	**E**	**39.4**	**E**	**41.1**	0.4	○ NSC
	Sun	D	29.7	D	30.6	--	○
US-101 NB On from Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	2.5	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	**7.1**	●
	Sun	D	31.4	**F**	**>45**	**--**	● PI
US-101 SB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	**5.0**	●
	P.M.	**F**	**>45**	**F**	**>45**	3.3	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	**6.8**	●
US-101 SB Off to Bayshore Blvd/Third St	A.M.	**E**	**39.8**	**E**	**41.4**	0	○ NSC
	P.M.	**E**	**36.1**	**E**	**37.3**	0	○ NSC
	Sun	C	24.6	C	25.1	--	○
US-101 SB On from Bayshore Blvd/Third St	A.M.	**F**	**>45**	**F**	**>45**	**10.5**	●
	P.M.	**F**	**>45**	**F**	**>45**	**12.5**	●
	Sun	C	23.7	C	26.0	--	○
I-280 NB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	Sun	C	26.0	C	26.0	--	○
I-280 NB On from Indiana St	A.M.	**F**	**>45**	**F**	**>45**	**10.0**	●
	P.M.	**F**	**>45**	**F**	**>45**	**16.0**	●
	Sun	C	25.2	C	26.1	--	○
I-280 SB Off to Pennsylvania Ave	A.M.	**E**	**36.3**	**E**	**36.9**	**18.1**	●
	P.M.	**F**	**>45**	**F**	**>45**	**9.6**	●
	Sun	D	30.6	D	31.1	--	○

Notes:

SF – San Francisco; NB – northbound;. SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution; PI – project impact.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.

b. Percent contribution of project traffic.

Source: CHS Consulting Group, *et al*. 2010.

While the freeway segment analysis did not find significant project impacts, both the intersection and freeway ramp analyses determined that Alternative 2A would result in *significant and unavoidable* impacts associated with increases in traffic volumes.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

4.1.6.2.2 Factor 3: Transit Impacts

Final Transit Plan

As discussed in Alternative 1, although the there is a plan for increased transit service to the transit study area, **Mitigation 4** requires preparation, approval, and implementation of the final transit-operating plan because the final Transit Plan has not been formally approved by SFMTA. Thus, with **Mitigation 4** project impacts on transit capacity would be *not significant with mitigation*.

Ridership and Capacity Utilization at Study Area Cordons

The Alternative 1 transit capacity analysis is representative of Alternative 2A (*significant and mitigable*; Section 4.1.3.3.2, Transit Impacts). **Mitigation 4** requires that the final Transit Plan would be prepared and implemented. With implementation of **Mitigation 4**, the study area impacts and the proposed action's contribution to cumulative impacts on transit capacity at the study area cordons would be *not significant with mitigation*.

Transit Capacity Utilization at Downtown Screenlines

The capacity utilization for the downtown screenlines for the A.M. and P.M. peak hours for the cumulative conditions are summarized in Section 4.1.3.3.2, Transit Impacts. As discussed in the Alternative 1 analysis, impacts on transit capacity at the downtown screenlines would be *not significant*.

Transit Capacity and Utilization at Regional Screenlines

The capacity utilization for the regional transit provider screenlines for the A.M. and P.M. peak hours for existing, 2030 baseline, and 2030 cumulative conditions are summarized in Section 4.1.3.3.2, Transit Impacts. As discussed in the Alternative 1 analysis, the cumulative impacts and the proposed action contribution to cumulative impacts on regional transit capacity would be *not significant*.

Transit Operations Impacts

During the A.M. peak hour, Alternative 2A would require additional transit vehicles on the same routes as Alternative 1. During the P.M. peak hour, Alternative 2A would require additional vehicles on the same routes as Alternative 1, except that Alternative 2A would also require additional vehicles on the 48-Quintara-24th St route. Impacts associated with Alternative 2A would be somewhat more extensive than those for Alternative 1. Alternative 3 would require 8 additional vehicles in the A.M. peak hour, and 12 additional vehicles in the P.M. peak hour. As for Alternative 1, these transit vehicles would be in addition to those identified to maintain 2030 baseline conditions (16 vehicles in the A.M. peak hour and 16 vehicles in the P.M. peak hour). **Mitigations 5 and 6** would also apply to Alternative 2A. Because a feasibility study of the improvements contemplated in **Mitigation 5** would be required, implementation of **Mitigation 5** is uncertain. Since implementation of **Mitigation 6** alone, without **Mitigation 5**, might not be sufficient to reduce the impacts to a not significant level, the project impacts would *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

4.1.6.2.3 Factor 4: Bicycle Network and Circulation

Alternative 2A bicycle trips would be accommodated within the proposed street network for this alternative which would improve bicycle routes and access within the new development and thereby improve the bicycle network and circulation in the vicinity. See the Alternative 1 discussion of bicycle network and circulation impacts in Section 4.1.3.3.3, Bicycle Network and Circulation. Operational impacts associated with Factor 4 would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or affect bicycle access. Therefore, transportation impacts associated with Factor 4 would not be different for these variants.

4.1.6.2.4 Factor 5: Pedestrian Circulation

Alternative 2A would improve sidewalks and the pedestrian network in the vicinity by ensuring adequate sidewalk widths and facilitating pedestrian circulation in areas not now served by such facilities. See the Alternative 1 discussion of Pedestrian Circulation impacts in Section 4.1.3.2.5, Pedestrian Circulation. Overall, impacts on pedestrian circulation associated with Factor 5 would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect pedestrian circulation. Therefore, transportation impacts associated with Factor 5 would not be different for these variants.

4.1.6.2.5 Factor 6: Emergency Access

Alternative 2A 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. 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), and emergency vehicles would be able to utilize transit lanes when streets are congested. Therefore, the impacts of Alternative 2A on emergency access associated with Factor 6 would be *not significant*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for these variants.

4.1.6.2.6 Factor 7: Loading Impacts

The loading impacts assessment associated with Alternative 2A would be similar to the assessment completed for Alternative 1 (Section 4.1.3.3.6). The proposed action would establish a minimum number of loading spaces; more could be provided as part of individual development projects. Table 4.1.6-4 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. Within HPS, the loading demand and estimated supply would be similar. Impacts related to loading operations with Alternative 2A would be *not significant*, and no mitigation is proposed.

Table 4.1.6-4. Summary of Alternative 2A Loading Demand and Supply

Scenario/Project Site Area	*Daily Truck Generation*	*Peak Hour Loading Dock Space Demand*	*Supply*[a, b]
Hunters Point Shipyard	881	51	53

Notes:
a. Minimum number of loading spaces permitted per draft Design for Development standard for *CP-HPS Phase II Development Plan*.
b. Does not include stadium loading facilities.
Source: CHS Consulting Group, *et al*. 2009.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

4.1.7 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

Alternative 3 would not increase the total amount of development compared to Alternative 1 but would relocate approximately 1,350 housing units from Candlestick Point to HPS. Therefore, 4,000 residential units (rather than 2,650 residential units) would be developed at HPS. Alternative 3 would include all uses proposed with Alternative 1 with the exception of the stadium. Without a stadium, Alternative 3 would not have the game day or other stadium event transportation impacts associated with Alternative 1. Alternative 3 would have the same arena-related transportation effects as with Alternative 1. Alternative 3 would have the same roadway, transit, bikeway, and Bay Trail improvements proposed with Alternative 1, including the Yosemite Slough bridge; however, the bridge would be narrower than the bridge with Alternative 1.

Alternative 3 would generate 2,044 weekday A.M. trips, 2,337 weekday P.M. trips, and 1,728 Sunday P.M. trips. Alternative 3 trips would be slightly greater than Alternative 1 trips.

4.1.7.1 Construction Impacts

Impacts to transportation resources associated with construction activities for Alternative 3 would be comparable to those for Alternative 1 because the construction methods and construction footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1.

4.1.7.1.1 Factor 1: Construction Vehicle Traffic and Roadway Impacts

Construction activities associated with Alternative 3 would be similar to Alternative 1. Depending on the phasing of the additional development, Alternative 3 may result in fewer construction traffic impacts between 2012 and 2017 when the new stadium would have been constructed, and somewhat greater impacts in the years the additional housing would be constructed. Development and implementation of **Mitigation 1** (Construction TMP as described for Alternative 1) would help minimize Alternative 3's contribution to cumulative construction-related traffic impacts. Some disruption and increased delays would still occur even with implementation of a construction TMP; therefore, significant construction-related traffic impacts on local and regional roadways would still be possible. Localized construction-related traffic impacts would therefore *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

4.1.7.2 Operational Impacts

4.1.7.2.1 Factor 2: Increase in Traffic Volumes

Project Travel Demand Management Plan

Alternative 3 would be similar to Alternative 1, except that instead of a new football stadium, which generates very few weekday peak hour vehicle trips, there would be additional housing. The additional housing envisioned under Alternative 3 would generate weekday peak hour vehicular traffic similar to Alternative 1. As discussed in the Alternative 1 analysis, the final TDM Plan has not yet been formally approved, and **Mitigation 2** would require that the final TDM Plan be prepared and implemented.

With implementation of the **Mitigation 2**, alternative modes would be encouraged, the use of single-occupant vehicles would be discouraged, and the impact of additional vehicles generated by Alternative 3 would be lessened. However, Alternative 3 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.

Intersection Traffic Impacts

The study intersections that would require mitigation or have significant and unavoidable impacts due to the increase in traffic volumes with implementation of Alternative 1 would also apply to Alternative 3. Section 4.1.3.3.1, Increase in Traffic Volumes, discusses traffic effects of those intersections and the feasibility of mitigation measures. The intersection LOS is shown in Table 4.1.7-1. Figure 4.1.7-1 shows the weekday A.M./P.M. peak hour intersection volumes, and Figure 4.1.7-2 shows the Sunday P.M. peak hour volumes.

Table 4.1.7-1. Intersection LOS – 2030 Baseline and Alternative 3 Conditions

Intersection		*Peak Hour*	*2030 Baseline*		*Alternative 3*			
			LOS[a]	**Delay/ v/c**[b]	**LOS**	**Delay/ v/c**	**Percent**[c]	**Impact**
City and County of San Francisco Streets								
#1002	Third St/Cesar Chavez St	A.M.	**F**	**>80/1.49**	**F**	**>80/1.63**	**8.6**	●
		P.M.	**F**	**>80/1.45**	**F**	**>80/1.75**	**9.0**	●
		Sun	C	29.2	**F**	**>80/0.78**	**--**	● PI
#1003	Third St/Cargo Way	A.M.	**F**	**>80/1.21**	**F**	**>80/1.90**	**10.0**	●
		P.M.	**F**	**>80/1.23**	**F**	**>80/1.74**	**10.0**	●
		Sun	C	29.2	C	33.3	--	○
#1004	Third St/Evans Ave	A.M.	**F**	**>80/1.13**	**F**	**>80/1.44**	**13.4**	●
		P.M.	**F**	**>80/1.18**	**F**	**>80/1.56**	**12.3**	●
		Sun	D	44.0	**E**	**66.5/0.91**	**--**	● PI
#1006	Third St/Palou Ave	A.M.	D	54.9	**F**	**>80/1.97**	**--**	● PI
		P.M.	**F**	**>80/1.51**	**F**	**>80/6.07**	**12.3**	●
		Sun	**E**	**75.5/0.67**	**F**	**>80/2.51**	**17.7**	●
#1008	Third St/Carroll Ave	A.M.	B	11.0	B	18.6	--	○
		P.M.	B	13.4	**E**	**66.5/0.92**	**--**	● PI
		Sun	B	10.2	**E**	**60.3/0.65**	**--**	● PI
#1009	Third St/Paul Ave/Gilman Ave	A.M.	**F**	**>80/1.15**	**F**	**>80/1.89**	**5.0**	●
		P.M.	**F**	**>80/1.27**	**F**	**>80/3.32**	4.7	○ NSC
		Sun	**E**	**62.8/0.71**	**F**	**>80/1.82**	**5.7**	●
#1016	Evans Ave/Cesar Chavez St	A.M.	**F**	**>80/1.85**	**F**	**>80/1.92**	**7.0**	●
		P.M.	**F**	**>80/1.78**	**F**	**>80/1.84**	**6.4**	●

Table 4.1.7-1. Intersection LOS – 2030 Baseline and Alternative 3 Conditions								
Intersection		*Peak Hour*	*2030 Baseline*		*Alternative 3*			
			LOS[a]	**Delay/ v/c**[b]	**LOS**	**Delay/ v/c**	**Percent**[c]	**Impact**
		Sun	B	16.9	B	19.1	--	○
#1048	Jennings St/Middle Point Rd/Evans Ave	A.M.	**C**	22.9	C	29.5	--	○
		P.M.	**C**	29.1	C	33.4	--	○
		Sun	B	19.7	C	20.3	--	○
#1058	Evans Ave/Napoleon St/Toland St	A.M.	**F**	**>80/1.12**	**F**	**>80/1.50**	**7.5**	●
		P.M.	**F**	**>80/1.48**	**F**	**>80/1.62**	**6.6**	●
		Sun	**E**	**57.3/0.48**	**E**	**59.9/0.58**	**11.5**	●
Hunters Point Shipyard Streets								
#110	Innes Ave/Donahue St	A.M.	B	14.5	A	9.4	--	○
		P.M.	B	14.7	A	7.6	--	○
		Sun	B	15.2	A	8.1	--	○
#111	Donahue St/Galvez Ave	A.M.	A	8.7	C	18.0	--	○
		P.M.	A	8.8	C	20.7	--	○
		Sun	A	8.7	B	13.0	--	○
#112	Donahue St/Lockwood St	A.M.	A	8.5	A	9.6	--	○
		P.M.	A	8.5	A	9.6	--	○
		Sun	A	8.5	A	9.0	--	○
#113	Crisp Rd/I St (Outer Ring Rd)	A.M.			C	15.7	--	○
		P.M.		Proposed Intersection	D	16.6	--	○
		Sun			D	19.0	--	○
#114	Crisp Rd/Spear St (Inner Ring Rd)	A.M.	A	7.4	C	15.0	--	○
		P.M.	A	7.4	C	15.9	--	○
		Sun	A	7.4	C	16.0	--	○
#115	Robinson St/Spear Ave	A.M.			**F (SBL)**	**>50/0.63**	**--**	⦿ PI
		P.M.		Proposed Intersection	**F (SBL)**	**>50/1.58**	**--**	⦿ PI
		Sun			C	18.7	--	○
#116	Lockwood St/Spear Ave	A.M.	A	8.4	C	15.9	--	○
		P.M.	A	8.5	B	14.6	--	○
		Sun	A	8.4	A	9.4	--	○

Notes:

LOS – level of service; A.M. – A.M. Peak; P.M. – P.M. peak; Sun – Sunday Peak NBL – northbound left turn; SBL – southbound left turn; EBL – eastbound left turn; WBL – westbound left turn; NSC – no significant contribution.

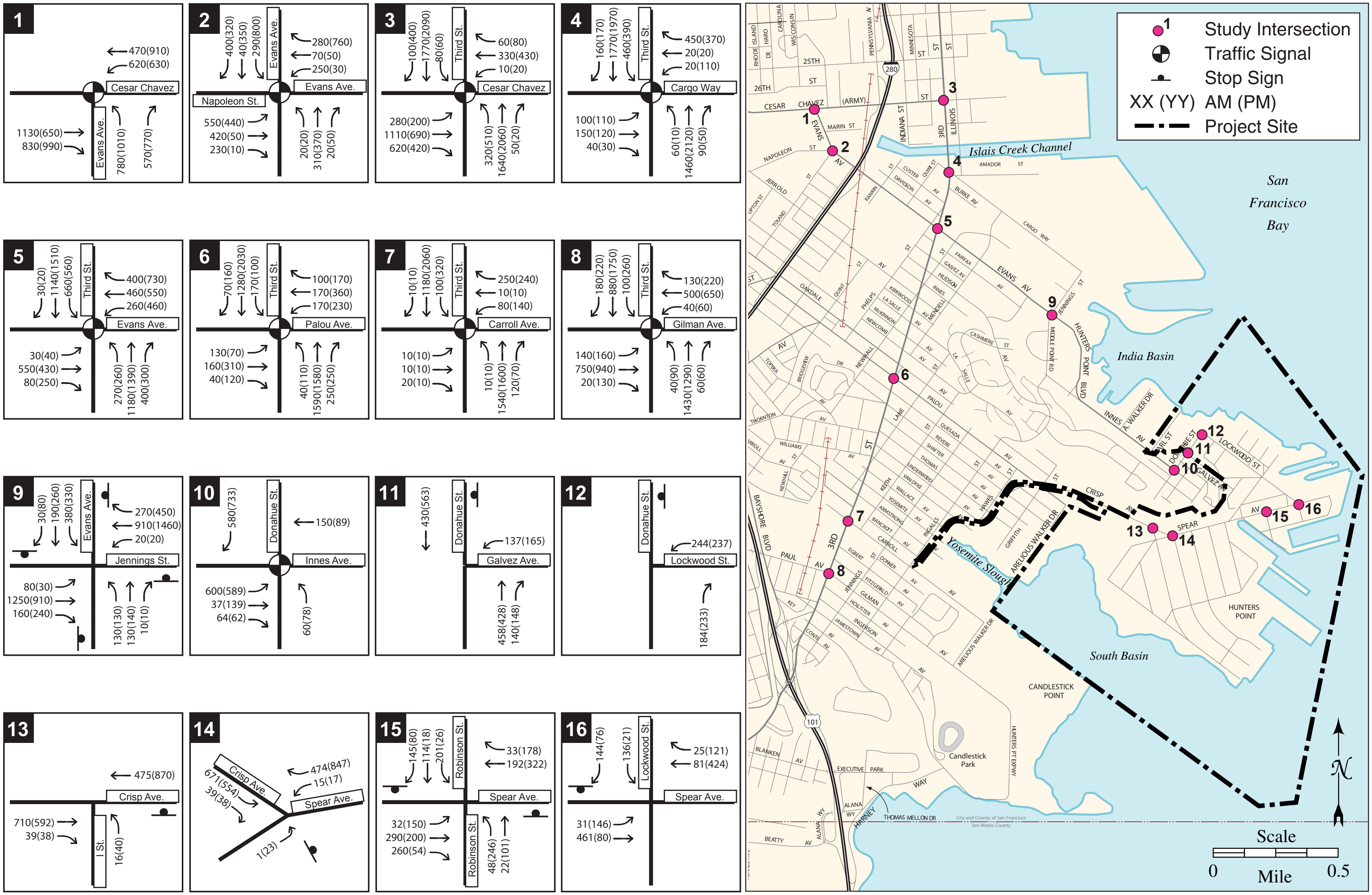
● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

a. Intersections operating at LOS E or LOS F conditions highlighted in bold
b. Delay in seconds per vehicle and overall intersection volume-to-capacity (v/c) ratio is presented where intersections operating at LOS E or LOS F conditions. For side street STOP-controlled intersections, delay and LOS presented for worst approach.
c. Percent contribution of project traffic.
d. Significant cumulative and project impacts are presented, and the project impact is distinguished by using the "PI" designation.

Sources: CHS Consulting Group, *et al*. 2010; CHS Consulting Group, *et al*. 2009.



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.7-1. Weekday A.M. and P.M. Peak Hour Traffic Volumes - Alternative 3

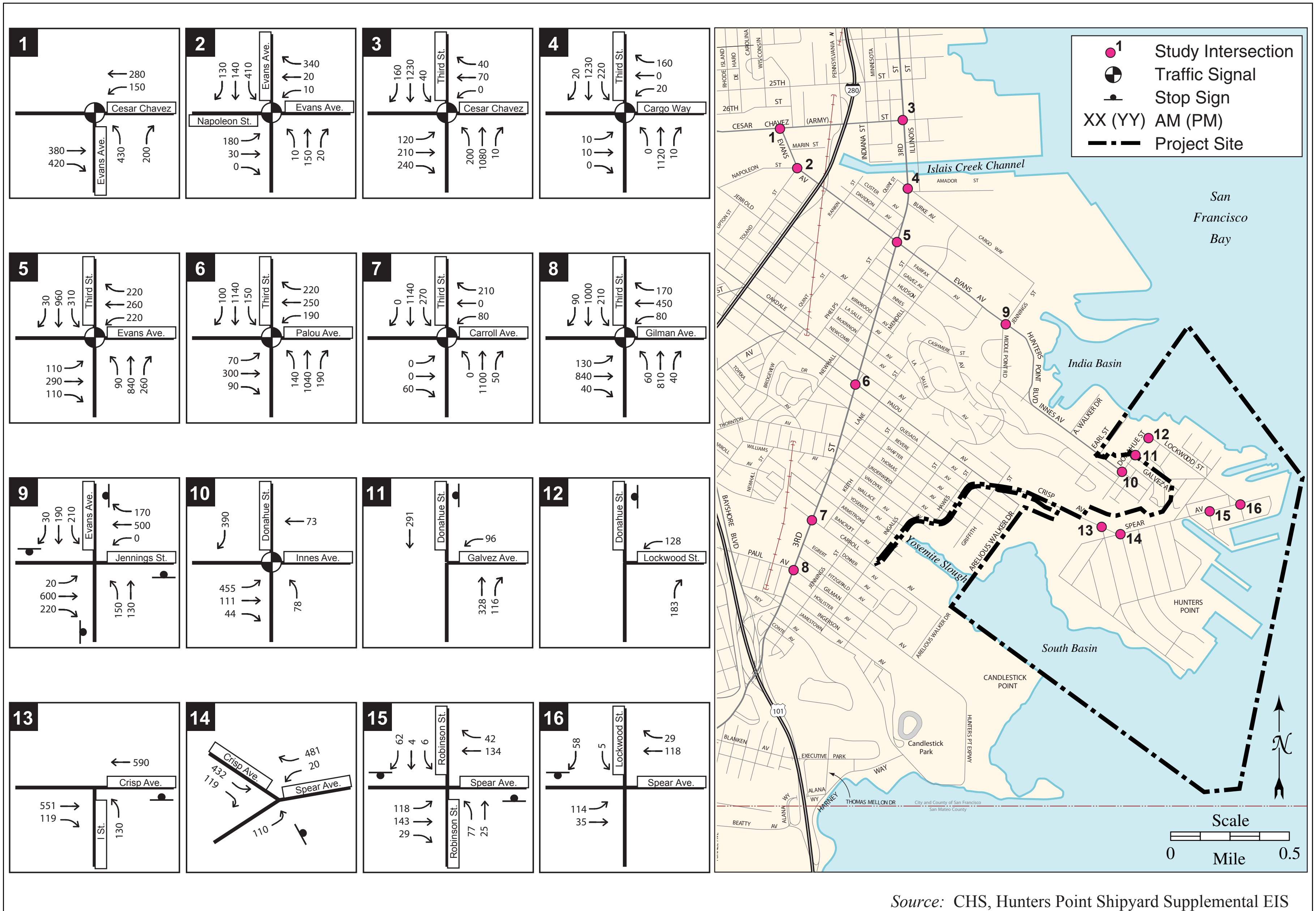


Figure 4.1.7-2. Sunday P.M. Peak Hour Traffic Volumes - Alternative 3

INTERSECTIONS WITH NON-SIGNIFICANT IMPACTS

The following intersections are expected to operate at acceptable levels of service; therefore, the impact would be *not significant* and no mitigation is proposed.

#1048 Jennings St/Middle Point Rd/Evans Ave;

#110 Innes Ave/Donahue St;

#111 Donahue St/Galvez Ave;

#112 Donahue St/Lockwood St;

#113 Crisp Rd/I St (Outer Ring Rd);

#114 Crisp Rd/Spear St (Inner Ring Rd); and

#116 Lockwood St/Spear Ave.

INTERSECTIONS WITH PROJECT AND CUMULATIVE TRAFFIC IMPACTS

The following study intersections are projected to operate at unacceptable levels with Alternative 3 and would result in project-specific impacts or would contribute to significant cumulative impacts during at least one peak hour.

#1002 Third St/Cesar Chavez St – project and cumulative *(significant and unavoidable);*

#1003 Third St/Cargo Way – project and cumulative (*significant and unavoidable);*

#1004 Third St/Evans Ave – project and cumulative *(significant and unavoidable);*

#1006 Third St/Palou Ave – project and cumulative *(significant and unavoidable);*

#1008 Third St/Carroll Ave – project-specific *(significant and unavoidable);*

#1009 Third St/Paul Ave/Gilman Ave – project and cumulative (*significant and unavoidable);*

#1016 Evans Ave/Cesar Chavez St – project and cumulative (*significant and unavoidable);*

#1058 Evans Ave/Napoleon St/Toland St – project and cumulative *(significant and unavoidable);* and

#115 Robinson St/Spear Ave – project-specific *(significant and mitigable).*

At intersections that would operate at LOS E or LOS F under 2030 baseline conditions and would continue to operate at LOS E or LOS F under 2030 cumulative conditions, the increase in vehicle trips from 2030 baseline was reviewed to determine whether the increase would contribute considerably (by five percent or more) to critical movements operating at LOS E or LOS F. Alternative 3 contributions were determined to be significant and no feasible mitigation measures were identified for intersections described as "project and cumulative *(significant and unavoidable)*" in the list above.

Discussions on possible mitigation measures associated with these intersections are included with the Alternative 1 analysis. The Alternative 1 analysis concluded that due to the issues related to acquisition of additional right-of-way, mitigation would be infeasible for many intersections. Therefore, Alternative 3 traffic impacts and contribution to cumulative impacts at these locations would *remain significant and unavoidable*.

The intersection of Robinson St/Spear Ave would operate at an unacceptable LOS under Alternative 3. As described above (see Section 4.1.3.3.1, Increase in Traffic Volumes), implementation of **Mitigation 3** would minimize Alternative 2 transportation impacts. Therefore, traffic impacts at the intersection of Robinson Street/Spear Avenue would be *not significant with mitigation*.

Freeway Traffic Impacts

FREEWAY SEGMENT IMPACTS

Alternative 3 would create impacts at similar freeway mainline sections and freeway ramp junctions to Alternative 1, although the magnitude of impacts may be greater with Alternative 3 due to increased traffic generation compared to Alternative 1. Table 4.1.7-2 presents the results of the mainline LOS analysis and summarizes the mainline segment impacts for 2030 baseline and Alternative 3 conditions. In some cases, the mainline segments operate at acceptable levels with the addition of project traffic during a specific peak periods. The increase in traffic due to Alternative 3 would result in increases in traffic volumes on the freeway segments that would cause the operations on all the study area freeway segments to deteriorate from the already LOS F conditions; however, the percent contribution of Alternative 3 traffic is not considered significant and does not significantly contribute to the traffic impacts. Because impacts would be *not significant*, no mitigation is proposed.

Table 4.1.7-2. Mainline Segment LOS and Segment Impacts – 2030 Baseline and Alternative 3 Conditions

Ramp Location	*Peak Hour*	*2030 Baseline*		*Alternative 3*			
		LOS	Density[a]	LOS	Density	Percent[b]	Impact
US-101, the SF County Line NB	A.M.	**F**	**>45**	**F**	**>45**	1.5	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.1	○ NSC
	Sun	D	30.3	D	32.4	--	○
US-101, the SF County Line SB	A.M.	**F**	**>45**	**F**	**>45**	0.9	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.3	○ NSC
	Sun	D	31.8	D	34.4	--	○
SF/Oakland Bay Bridge EB	A.M.	**F**	**>45**	**F**	**>45**	1.5	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	2.1	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	1.4	○ NSC
SF/Oakland Bay Bridge WB	A.M.	**F**	**>45**	**F**	**>45**	1.0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0.8	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	0.9	○ NSC
I-280, south of US-101 NB	A.M.	**F**	**>45**	**F**	**>45**	0.7	○ NSC
	P.M.	D	33.2	D	33.3	--	○
	Sun	C	21.6	C	21.6	--	○
I-280, south of US-101 SB	A.M.	D	34.4	D	34.6	--	○
	P.M.	**F**	**>45**	**F**	**>45**	0.7	○ NSC
	Sun	D	29.5	D	29.5	--	○

Notes:
SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution.
● - Significant and unavoidable (no feasible mitigation)
⦿ - Significant and mitigable (not significant with mitigation)
○ - Not significant
a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.
b. Percent contribution of project traffic.
Source: CHS Consulting Group, *et al*. 2010.

FREEWAY RAMP IMPACTS

Alternative 3 would create similar significant traffic impacts to freeway ramp junctions as Alternative 1. Table 4.1.7-3 presents the results of the ramp junction merge (on-ramp) and diverge (off-ramp) analysis and summarizes the impacts for 2030 baseline and Alternative 3 conditions. As described in the discussion of Alternative 1 impacts in Section 4.1.3.3.1, Increase in Traffic Volumes, no feasible mitigation measures have been identified for the freeway ramp junctions expected to experience significant impacts under Alternative 1 conditions.

While the freeway segment analysis did not find significant project impacts, both the intersection and freeway ramp analyses determined that Alternative 3 would result in *significant and unavoidable* impacts associated with increases in traffic volumes.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

Table 4.1.7-3. Ramp Junction LOS and Segment Impacts – 2030 Baseline and Alternative 3 Conditions

Ramp Location	***Peak Hour***	***2030 Baseline***		***Alternative 3***			
		LOS	**Density[a]**	**LOS**	**Density**	**Percent[b]**	**Impact**
US-101 NB Off to Third St/Bayshore Blvd	A.M.	D	31.3	D	32.5	--	○
	P.M.	**E**	**35.5**	**E**	**37.4**	**7.9**	●
	Sun	C	22.8	C	24.1	--	○
US-101 NB On from Third St/Bayshore Blvd	A.M.	C	22.3	C	23.5	--	○
	P.M.	C	27.9	D	30.0	--	○
	Sun	C	21.9	C	22.4	--	○
US-101 NB Off to Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	2.2	○ NSC
	P.M.	**E**	**39.4**	**E**	**40.8**	0.4	○ NSC
	Sun	D	29.7	D	30.6	--	○
US-101 NB On from Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	2.4	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	**5.8**	●
	Sun	D	31.4	**F**	**>45**	**--**	● PI
US-101 SB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	4.3	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	2.9	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	**6.3**	●
US-101 SB Off to Bayshore Blvd/Third St	A.M.	**E**	**34.7**	**E**	**41.4**	0	○ NSC
	P.M.	**E**	**31.2**	**E**	**37.3**	0	○ NSC
	Sun	C	22.4	C	25.1	--	○
US-101 SB On from Bayshore Blvd/Third St	A.M.	**F**	**>45**	**F**	**>45**	**9.5**	●
	P.M.	**F**	**>45**	**F**	**>45**	**10.8**	●
	Sun	C	23.7	C	25.9	--	○
I-280 NB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	Sun	C	26.0	C	26.0	--	○
I-280 NB On from Indiana St	A.M.	**F**	**>45**	**F**	**>45**	**9.0**	●
	P.M.	**F**	**>45**	**F**	**>45**	**13.4**	●
	Sun	C	25.24	C	26.0	--	○
I-280 SB Off to Pennsylvania Ave	A.M.	**E**	**36.3**	**E**	**36.9**	**15.8**	●
	P.M.	**F**	**>45**	**F**	**>45**	**8.6**	●
	Sun	D	30.6	D	31.1	--	○

Notes:

SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution; PI – project impact.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.

b. Percent contribution of project traffic.

Source: CHS Consulting Group, *et al*. 2010.

4.1.7.2.2 Factor 3: Transit Impacts

Final Transit Plan

As discussed in Alternative 1, although the there is a plan for increased transit service to the transit study area, because the final Transit Plan has not been formally approved by SFMTA, **Mitigation 4** is proposed so that the final Transit Plan would be prepared and implemented. Thus, **Mitigation 4** requires preparation, approval, and implementation of the final transit-operating plan; therefore, project impacts on transit capacity would be *not significant with mitigation*.

Ridership and Capacity Utilization at Study Area Cordons

The Alternative 1 transit capacity analysis is representative of Alternative 3. **Mitigations 5 and 6** are proposed so that the final Transit Plan would be prepared and implemented. With implementation of **Mitigation 5**, the study area impacts and the proposed action's contribution to cumulative impacts on transit capacity at the study area cordons would be *not significant with mitigation*.

Transit Capacity Utilization at Downtown Screenlines

The capacity utilization for the downtown screenlines for the A.M. and P.M. peak hours for the cumulative conditions are summarized in Section 4.1.3.3.2, Transit Impacts. As discussed in the Alternative 1 analysis, impacts on transit capacity at the downtown screenlines would be *not significant*.

Transit Capacity and Utilization at Regional Screenlines

The capacity utilization for the regional transit provider screenlines for the A.M. and P.M. peak hours for existing, 2030 baseline, and 2030 cumulative conditions are summarized in Section 4.1.3.3.2, Transit Impacts. As discussed in the Alternative 1 analysis, the cumulative impacts and the proposed action's contribution to cumulative impacts on regional transit capacity would be *not significant*.

Transit Operations Impacts

During the A.M. peak hour, Alternative 3 would require additional transit vehicles on the same routes as Alternative 1. During the P.M. peak hour, Alternative 3 would require additional vehicles on the same routes as Alternative 1, except that Alternative 3 would also require additional vehicles on the 48-Quintara-24th St route. Impacts associated with Alternative 3 would be somewhat more extensive than those for Alternative 1. Alternative 3 would require 8 additional vehicles in the A.M. peak hour, and 12 additional vehicles in the P.M. peak hour. As for Alternative 1, these transit vehicles would be in addition to those identified to maintain 2030 baseline conditions (16 vehicles in the A.M. peak hour and 16 vehicles in the P.M. peak hour). **Mitigations 5 and 6** would also apply to Alternative 3. Because a feasibility study of the improvements contemplated in **Mitigation 5** would be required, implementation of **Mitigation 5** is uncertain. Since implementation of **Mitigation 6** alone, without **Mitigation 5**, might not be sufficient to reduce the impacts to a not significant level, the project impacts would *remain significant and unavoidable* with mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

4.1.7.2.3 Factor 4: Bicycle Network and Circulation

Alternative 3 bicycle trips would be accommodated within the proposed street network for this alternative which would improve bicycle routes and access within the new development and thereby improve the bicycle network and circulation in the vicinity. See the Alternative 1 discussion of bicycle network and circulation impacts in Section 4.1.3.2.4, Bicycle Network and Circulation. Operational impacts associated with Factor 4 would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or affect bicycle access. Therefore, transportation impacts associated with Factor 4 would not be different for these variants.

4.1.7.2.4 Factor 5: Pedestrian Circulation

Alternative 3 would improve sidewalks and the pedestrian network in the vicinity by ensuring adequate sidewalk widths and facilitating pedestrian circulation in areas not now served by such facilities. See the Alternative 1 discussion of Pedestrian Circulation impacts in Section 4.1.3.2.5, Pedestrian Circulation. Overall, impacts on pedestrian circulation associated with Factor 5 would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect pedestrian circulation. Therefore, transportation impacts associated with Factor 5 would not be different for these variants.

4.1.7.2.5 Factor 6: Emergency Access

Alternative 3 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. 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), and emergency vehicles would be able to utilize transit lanes when streets are congested. Therefore, the impacts of Alternative 3 on emergency access associated with Factor 6 would be *not significant*.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic or adversely affect emergency access. Therefore, transportation impacts associated with Factor 6 would not be different for these variants.

4.1.7.2.6 Factor 7: Loading Impacts

The loading impacts assessment associated with Alternative 3 is similar to the assessment completed for Alternative 1 (see Section 4.1.3.3.6, Loading Impacts). The proposed action would establish a minimum number of loading spaces; more could be provided as part of individual development projects. Table 4.1.7-4 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. Within HPS, the loading demand and estimated supply would be similar. Impacts related to loading operations with Alternative 3 would be *not significant*, and no mitigation is proposed.

Table 4.1.7-4. Summary of Alternative 3 Loading Demand and Supply

Scenario/Project Site Area	*Daily Truck Generation*	*Peak Hour Loading Dock Space Demand*	*Supply*[a, b]
Hunters Point Shipyard	766	44	47

Notes:

a. Minimum number of loading spaces permitted per draft Design for Development standard for *CP-HPS Phase II Development Plan*.

b. Does not include stadium loading facilities.

Source: CHS Consulting Group, *et al*. 2009.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

4.1.8 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

Alternative 4 is a reduced-development alternative. Land uses proposed under Alternative 4 would be similar to those proposed under Alternative 1; however, residential densities and commercial intensities for most uses would be approximately 30 percent less at full build-out in comparison to build-out of Alternative 1. This alternative would not include construction of a bridge over Yosemite Slough. This alternative assumes that the San Francisco 49ers football team would continue to use the existing Candlestick Park stadium.

Alternative 4 would generate 1,565 weekday A.M. trips, 1,752 weekday P.M. trips, and 1,455 Sunday P.M. trips. Alternative 4 trips would be less than Alternative 1 trips.

4.1.8.1 Construction Impacts

Impacts to transportation resources associated with construction activities for Alternative 4 would be comparable to those for Alternative 1 because the construction methods and construction footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1.

4.1.8.1.1 Factor 1: Construction Vehicle Traffic and Roadway Impacts

Construction activities associated with Alternative 4 would be similar to Alternative 1, except Alternative 4 assumes a general reduction in development as compared to Alternative 1 (approximately a 30 percent reduction). The extent and duration would likely be somewhat less than identified for Alternative 1. Development and implementation of **Mitigation 1** (Construction TMP as described for Alternative 1) would help minimize Alternative 4's contribution to cumulative construction-related traffic impacts. Some disruption and increased delays would still occur even with implementation of a construction TMP; therefore, significant construction-related traffic impacts on local and regional roadways are still possible. Localized construction-related traffic impacts would therefore *remain significant and unavoidable* with mitigation.

4.1.8.2 Operational Impacts

4.1.8.2.1 Factor 2: Increase in Traffic Volumes

Project Travel Demand Management Plan

Alternative 4 would be similar to Alternative 1, except the reduced development alternative generates slightly fewer weekday peak hour vehicle trips. To minimize the potential for an increase in project-generated vehicles and the proposed action's contribution to significant cumulative impacts, implementation of a TDM Plan would be required. As discussed in the Alternative 1 analysis, the final TDM Plan has not yet been formally approved, and **Mitigation 2** is proposed so that the final TDM Plan would be prepared and implemented.

With implementation of the **Mitigation 2**, alternative modes would be encouraged, the use of single-occupant vehicles would be discouraged, and the impact of additional vehicles generated by Alternative 4 would be lessened. However, Alternative 4 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. The proposed action and proposed action's contribution to traffic would *remain significant and unavoidable* with mitigation.

Intersection Traffic Impacts

The study intersections that would require mitigation or have significant and unavoidable impacts due to the increase in traffic volumes with implementation of Alternative 1 would also apply to Alternative 4. Section 4.1.3.3.1, Increase in Traffic Volumes, discusses traffic effects of those intersections and the feasibility of mitigation measures. The intersection LOS is shown in Table 4.1.8-1. Figure 4.1.8-1 shows the weekday A.M./P.M. peak hour intersection volumes, and Figure 4.1.8-2 shows the Sunday P.M. peak hour volumes.

INTERSECTIONS WITH NON-SIGNIFICANT IMPACTS

The following intersections are expected to operate at acceptable levels of service; therefore, the impact would be *not significant* and no mitigation is proposed.

#1048 Jennings St/Middle Point Rd/Evans Ave;

#110 Innes Ave/Donahue St;

#111 Donahue St/Galvez Ave;

#112 Donahue St/Lockwood St;

#113 Crisp Rd/I St (Outer Ring Rd);

#114 Crisp Rd/Spear St (Inner Ring Rd); and

#116 Lockwood St/Spear Ave.

Table 4.1.8-1. Intersection LOS – 2030 Baseline and Alternative 4 Conditions

Intersection		***Peak Hour***	***2030 Baseline***		***Alternative 4***			
			LOS	**Delay/ v/c** [b]	**LOS**	**Delay/ v/c**	**Percent** [c]	**Impact**
City and County of San Francisco Streets								
#1002	Third St/Cesar Chavez St	A.M.	**F**	**>80/1.49**	**F**	**>80/1.61**	**6.9**	●
		P.M.	**F**	**>80/1.45**	**F**	**>80/1.70**	**7.2**	●
		Sun	C	29.2	D	53.2	**--**	○
#1003	Third St/Cargo Way	A.M.	**F**	**>80/1.21**	**F**	**>80/1.84**	**8.1**	●
		P.M.	**F**	**>80/1.23**	**F**	**>80/1.68**	**8.1**	●
		Sun	C	29.2	C	27.7	--	○
#1004	Third St/Evans Ave	A.M.	**F**	**>80/1.13**	**F**	**>80/1.38**	**10.6**	●
		P.M.	**F**	**>80/1.18**	**F**	**>80/1.47**	**9.6**	●
		Sun	**D**	**44.0**	D	50.5	**--**	○
#1006	Third St/Palou Ave	A.M.	**D**	**54.9**	**F**	**>80/1.75**	**--**	● PI
		P.M.	**F**	**>80/1.51**	**F**	**>80/5.37**	**10.1**	●
		Sun	**E**	**75.5/0.67**	**F**	**>80/2.70**	**17.7**	●
#1008	Third St/Carroll Ave	A.M.	B	11.0	B	17.7	--	○
		P.M.	B	13.4	**E**	**55.9/0.86**	**--**	● PI
		Sun	B	10.2	D	40.2	**--**	○
#1009	Third St/Paul Ave/Gilman Ave	A.M.	**F**	**>80/1.15**	**F**	**>80/1.82**	3.7	○NSC
		P.M.	**F**	**>80/1.27**	**F**	**>80/2.87**	3.6	○NSC
		Sun	**E**	**62.8/0.71**	**F**	**>80/1.67**	**5.7**	●

Table 4.1.8-1. Intersection LOS – 2030 Baseline and Alternative 4 Conditions

Intersection		Peak Hour	2030 Baseline		Alternative 4			
			LOS	Delay/ v/c [b]	LOS	Delay/ v/c	Percent[c]	Impact
#1016	Evans Ave/Cesar Chavez St	A.M.	**F**	**>80/1.85**	**F**	**>80/1.90**	**5.5**	●
		P.M.	**F**	**>80/1.78**	**F**	**>80/1.83**	4.8	○NSC
		Sun	B	16.9	B	18.9	--	○
#1048	Jennings St/Middle Point Rd/Evans Ave	A.M.	C	22.9	C	24.4	--	○
		P.M.	C	29.1	C	27.1	--	○
		Sun	B	19.7	B	19.9	--	○
#1058	Evans Ave/Napoleon St/Toland St	A.M.	**F**	**>80/1.12**	**F**	**>80/1.48**	**5.7**	●
		P.M.	**F**	**>80/1.48**	**F**	**>80/1.60**	4.9	○NSC
		Sun	**E**	**57.3/0.48**	**E**	**60.0/0.56**	**9.6**	●
Hunters Point Shipyard Streets								
#110	Innes Ave/Donahue St	A.M.	B	14.5	A	9.9	--	○
		P.M.	B	14.7	A	8.7	--	○
		Sun	B	15.2	A	9.6	--	○
#111	Donahue St/Galvez Ave	A.M.	A	8.7	B	13.6	--	○
		P.M.	A	8.8	B	14.3	--	○
		Sun	A	8.7	B	10.9	--	○
#112	Donahue St/Lockwood St	A.M.	A	8.5	A	9.1	--	○
		P.M.	A	8.5	A	9.2	--	○
		Sun	A	8.5	A	8.8	--	○
#113	Crisp Rd/I St (Outer Ring Rd)	A.M.			C	14.5	--	○
		P.M.		Proposed Intersection	C	14.6	--	○
		Sun			C	20.3	--	○
#114	Crisp Rd/Spear St (Inner Ring Rd)	A.M.	A	7.4	C	13.7	--	○
		P.M.	A	7.4	C	14.1	--	○
		Sun	A	7.4	C	20.9	--	○
#115	Robinson St/Spear Ave	A.M.			**E (SBL)**	**37.2/0.43**	**--**	⦿ PI
		P.M.		Proposed Intersection	**F (SBL)**	**>50/0.76**	**--**	⦿ PI
		Sun			B	14.1	--	○
#116	Lockwood St/Spear Ave	A.M.	A	8.4	B	13.6	--	○
		P.M.	A	8.5	B	12.8	--	○
		Sun	A	8.4	A	9.1	--	○

Notes:

LOS – level of service; A.M. – A.M. Peak; P.M. – P.M. peak; Sun – Sunday Peak NBL – northbound left turn; SBL – southbound left turn; EBL – eastbound left turn; WBL – westbound left turn; NSC – no significant contribution; PI – project impact.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

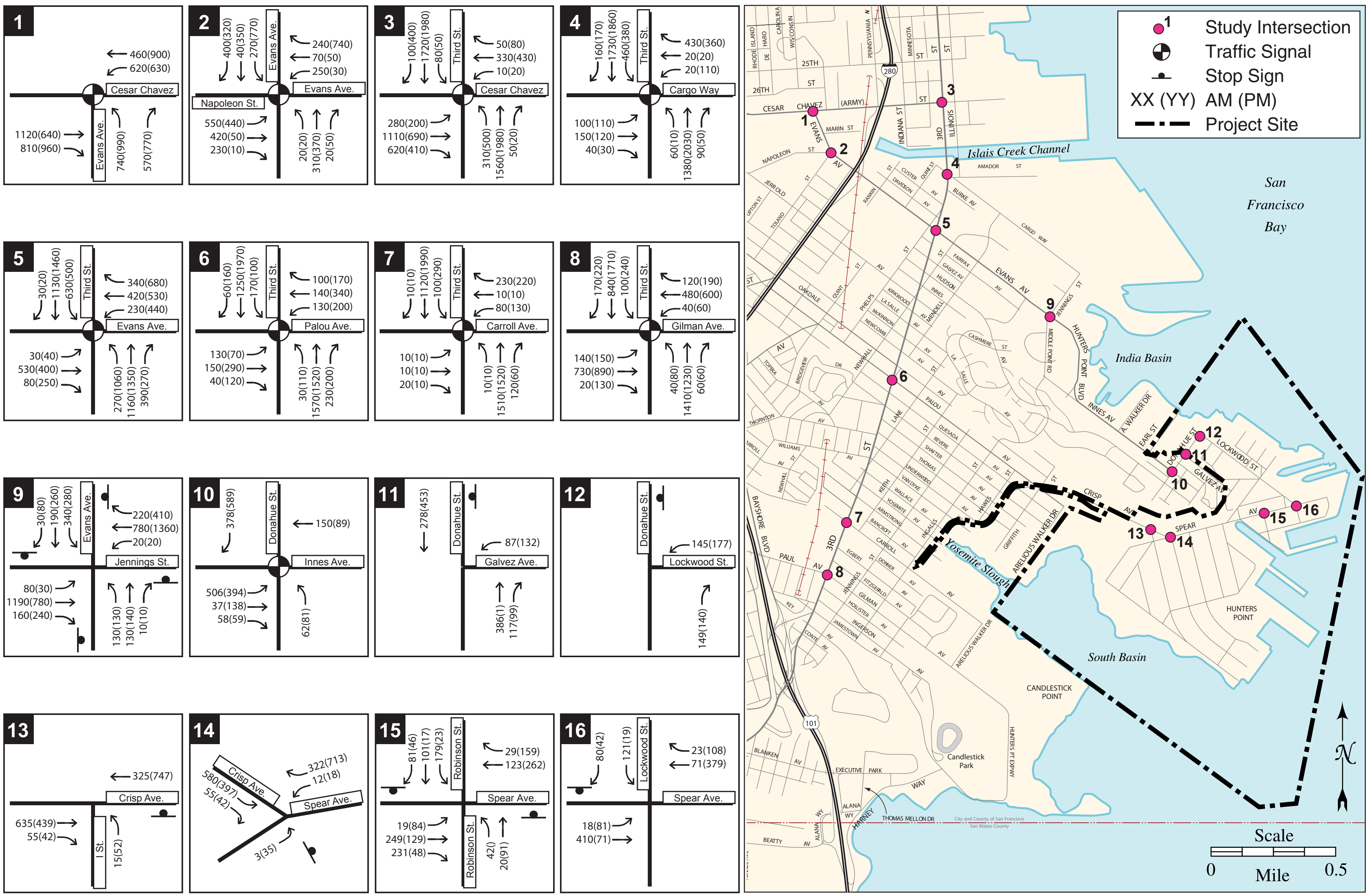
a. Intersections operating at LOS E or LOS F conditions highlighted in bold.

b. Delay in seconds per vehicle and overall intersection volume-to-capacity (v/c) ratio is presented where intersections operating at LOS E or LOS F conditions. For side street STOP-controlled intersections, delay and LOS presented for worst approach.

c. Percent contribution of project traffic.

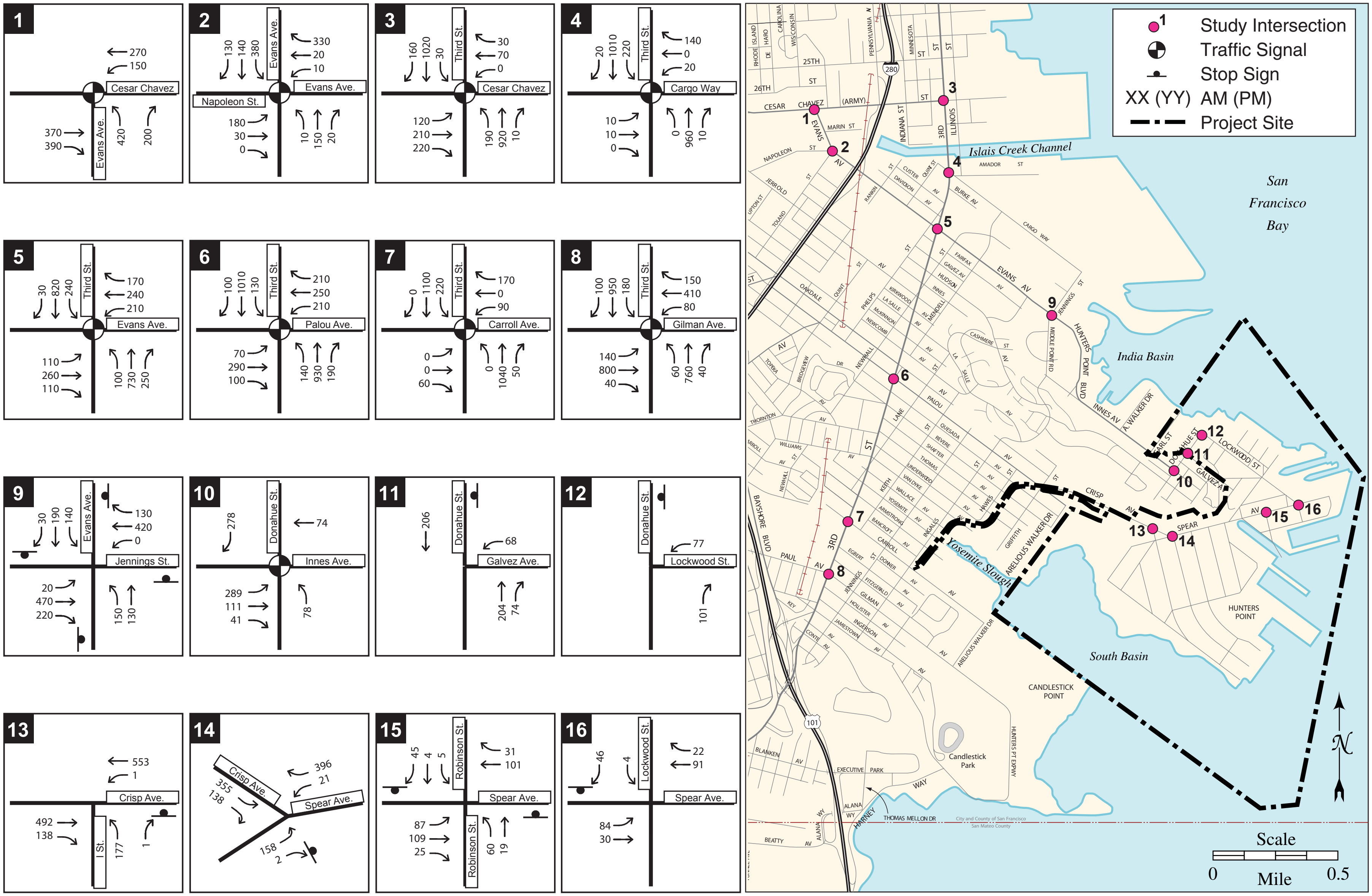
d. Significant cumulative and project impacts are presented, and the project impact is distinguished by using the "PI" designation.

Sources: CHS Consulting Group, *et al*. 2010; CHS Consulting Group, *et al*. 2009.



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.8-1. Weekday A.M. and P.M. Peak Hour Traffic Volumes - Alternative 4



Source: CHS, Hunters Point Shipyard Supplemental EIS

Figure 4.1.8-2. Sunday P.M. Peak Hour Traffic Volumes - Alternative 4

INTERSECTIONS WITH PROJECT AND CUMULATIVE TRAFFIC IMPACTS

The results show that of the following study intersections are projected to operate at unacceptable levels with Alternative 4 and would result in project-specific impacts or would contribute to significant cumulative impacts during at least one peak hour.

#1002 Third St/Cesar Chavez St – project and cumulative *(significant and unavoidable);*

#1003 Third St/Cargo Way – project and cumulative *(significant and unavoidable);*

#1004 Third St/Evans Ave – project and cumulative *(significant and unavoidable);*

#1006 Third St/Palou Ave – project and cumulative *(significant and unavoidable);*

#1008 Third St/Carroll Ave – project-specific *(significant and unavoidable);*

#1009 Third St/Paul Ave/Gilman Ave – project and cumulative *(significant and unavoidable);*

#1016 Evans Ave/Cesar Chavez St – project and cumulative *(significant and unavoidable);*

#1058 Evans Ave/Napoleon St/Toland St – project and cumulative (*significant and unavoidable);* and

#115 Robinson St/Spear Ave – project-specific *(significant and mitigable).*

At intersections that would operate at LOS E or LOS F under 2030 baseline conditions and would continue to operate at LOS E or LOS F under 2030 cumulative conditions, the increase in vehicle trips from 2030 baseline was reviewed to determine whether the increase would contribute considerably (by five percent or more) to critical movements operating at LOS E or LOS F. Alternative 4 contributions were determined to be significant and no feasible mitigation measures were identified for intersections described as "project and cumulative *(significant and unavoidable)*" in the list above.

Possible mitigation measures associated with these intersections are discussed with the Alternative 1 analysis. The Alternative 1 analysis concluded that due to the issues related to acquisition of additional right-of-way, mitigation would be infeasible. Therefore, Alternative 4 traffic impacts and contribution to cumulative impacts at these locations would *remain significant and unavoidable.*

The intersection of Robinson St/Spear Ave would operate at an unacceptable LOS under Alternative 4. As described above (see Section 4.1.3.3.1, Increase in Traffic Volumes), implementation of **Mitigation 3** would minimize Alternative 4 transportation impacts. Therefore, traffic impacts at the intersection of Robinson Street/Spear Avenue would be *not significant with mitigation.*

Freeway Traffic Impacts

FREEWAY SEGMENT IMPACTS

Alternative 4 would create impacts at similar freeway mainline sections and freeway ramp junctions to Alternative 1, although the magnitude of impacts may be less with Alternative 4 due to decreased traffic generation compared to Alternative 1 discussed in Section 4.1.3.3.1, Increase in Traffic Volumes. Table 4.1.8-2 presents the results of the mainline LOS analysis and summarizes the mainline segment impacts for 2030 baseline and Alternative 4 conditions. In some cases, the mainline segments operate at acceptable levels with the addition of project traffic during a specific peak periods. The increase in traffic due to Alternative 4 would result in increases in traffic volumes on the freeway segments that would cause the operations on all the study area freeway segments to deteriorate from the already LOS F conditions; however, the percent contribution of Alternative 1 traffic is not considered significant and does not significantly contribute to the traffic impacts. Because impacts would be *not significant*, no mitigation is proposed.

Table 4.1.8-2. Mainline Segment LOS and Segment Impacts – 2030 Baseline and Alternative 4 Conditions

Ramp Location	Peak Hour	2030 Baseline		Alternative 4			
		LOS	Density[a]	LOS	Density	Percent[b]	Impact
US-101, the SF County Line NB	A.M.	**F**	**>45**	**F**	**>45**	1.3	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0.7	○ NSC
	Sun	D	30.3	D	31.1	--	○
US-101, the SF County Line SB	A.M.	**F**	**>45**	**F**	**>45**	0.5	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.0	○ NSC
	Sun	D	31.8	D	34.1	--	○
SF/Oakland Bay Bridge EB	A.M.	**F**	**>45**	**F**	**>45**	0.9	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	1.8	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	1.4	○ NSC
SF/Oakland Bay Bridge WB	A.M.	**F**	**>45**	**F**	**>45**	0.9	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0.5	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	0.9	○ NSC
I-280, south of US-101 NB	A.M.	**F**	**>45**	**F**	**>45**	0.6	○ NSC
	P.M.	D	33.2	D	33.3	--	○
	Sun	C	21.6	C	21.6	--	○
I-280, south of US-101 SB	A.M.	D	34.4	D	34.6	--	○
	P.M.	**F**	**>45**	**F**	**>45**	0.6	○ NSC
	Sun	D	29.5	D	29.5	--	○

Notes:
SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution.
● - Significant and unavoidable (no feasible mitigation)
⦿ - Significant and mitigable (not significant with mitigation)
○ - Not significant
a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.
b. Percent contribution of project traffic.
Source: CHS Consulting Group, *et al*. 2010.

FREEWAY RAMP IMPACTS

Alternative 4 would create similar significant traffic impacts to freeway ramp junctions as Alternative 1. Table 4.1.8-3 presents the results of the ramp junction merge (on-ramp) and diverge (off-ramp) analysis and summarizes the impacts for 2030 No Action Alternative and Alternative 4 conditions. As described in the discussion of Alternative 1 impacts in Section 4.1.3.3.1, Increase in Traffic Volumes, no feasible mitigation measures have been identified for the freeway ramp junctions expected to experience significant impacts under Alternative 1 conditions. Therefore, Alternative 4 contributions to deficient freeway operating conditions would be *significant and unavoidable*.

While the freeway segment analysis did not find significant project impacts, both the intersection and freeway ramp analyses determined that Alternative 4 would result in *significant and unavoidable* impacts associated with increases in traffic volumes.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial additional traffic. Therefore, transportation impacts would not be different for these variants.

Table 4.1.8-3. Ramp Junction LOS and Segment Impacts – 2030 Baseline and Alternative 4 Conditions

Ramp Location	*Peak Hour*	*2030 Baseline*		*Alternative 4*			
		LOS	**Density[a]**	**LOS**	**Density**	**Percent[b]**	**Impact**
US-101 NB Off to Third St/Bayshore Blvd	A.M.	D	31.3	D	32.4	--	○
	P.M.	**E**	**35.5**	**E**	**37.1**	**6.9**	●
	Sun	C	22.8	C	23.3	--	○
US-101 NB On from Third St/Bayshore Blvd	A.M.	C	22.3	C	23.5	--	○
	P.M.	C	27.9	D	29.8	--	○
	Sun	C	21.9	C	21.9	--	○
US-101 NB Off to Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	1.9	○ NSC
	P.M.	**E**	**39.4**	**E**	**40.5**	0.3	○ NSC
	Sun	D	29.7	D	29.7	--	○
US-101 NB On from Bayshore Blvd/Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	1.5	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	**5.1**	●
	Sun	D	31.4	D	32.7	--	○
US-101 SB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	3.9	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	2.0	○ NSC
	Sun	**F**	**>45**	**F**	**>45**	4.1	○ NSC
US-101 SB Off to Bayshore Blvd/Third St	A.M.	**E**	**34.7**	**E**	**41.4**	0	○ NSC
	P.M.	**E**	**31.2**	**E**	**37.2**	0	○ NSC
	Sun	C	22.4	C	25.0	--	○
US-101 SB On from Bayshore Blvd/Third St	A.M.	**F**	**>45**	**F**	**>45**	**6.1**	●
	P.M.	**F**	**>45**	**F**	**>45**	**9.0**	●
	Sun	C	23.7	C	25.7	--	--
I-280 NB Off to Cesar Chavez St	A.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	P.M.	**F**	**>45**	**F**	**>45**	0	○ NSC
	Sun	C	26.0	C	26.0	--	○
I-280 NB On from Indiana St	A.M.	**F**	**>45**	**F**	**>45**	**5.9**	●
	P.M.	**F**	**>45**	**F**	**>45**	**11.7**	●
	Sun	C	25.2	C	25.7	--	○
I-280 SB Off to Pennsylvania Ave	A.M.	**E**	**36.3**	**E**	**36.8**	**14.3**	●
	P.M.	**F**	**>45**	**F**	**>45**	**5.7**	●
	Sun	D	30.6	D	30.9	--	○

Notes:

SF – San Francisco; NB – northbound; SB – southbound; EB – eastbound; WB – westbound; A.M. – A.M. Peak; P.M. – P.M. Peak; Sun – Sunday P.M. peak; NSC – no significant contribution.

● - Significant and unavoidable (no feasible mitigation)

⦿ - Significant and mitigable (not significant with mitigation)

○ - Not significant

a. Density of vehicles per segment measured in pc/mi/ln = passenger cars per mile per lane.

b. Percent contribution of project traffic.

Source: CHS Consulting Group, *et al*. 2010.

4.1.8.2.2 Factor 3: Transit Impacts

Final Transit Plan

As discussed in Alternative 1, although the there is a plan for increased transit service to the transit study area, because the final Transit Plan has not been formally approved by SFMTA, **Mitigation 4** would require that the final Transit Plan be prepared, approved, and implemented. With implementation of **Mitigation 4**, project impacts on transit capacity would be *not significant* with mitigation.

Ridership and Capacity Utilization at Study Area Cordons

The Alternative 1 transit capacity analysis is representative of Alternative 4 (*significant and mitigable*); see Section 4.1.3.3.2, Transit Impacts. **Mitigation 4** would require that the final Transit Plan be prepared, approved, and implemented. With implementation of **Mitigation 4**, the study area impacts and the proposed action's contribution to cumulative impacts on transit capacity at the study area cordons would be *not significant with mitigation*.

Transit Capacity Utilization at Downtown Screenlines

The capacity utilization for the downtown screenlines for the A.M. and P.M. peak hours for the cumulative conditions are summarized in Section 4.1.3.3.2, Transit Impacts. As discussed in the Alternative 1 analysis, impacts on transit capacity at the downtown screenlines would be *not significant*.

Transit Capacity and Utilization at Regional Screenlines

The capacity utilization for the regional transit provider screenlines for the A.M. and P.M. peak hours for existing, 2030 baseline, and 2030 cumulative conditions are summarized in Section 4.1.3.3.2, Transit Impacts. As discussed in the Alternative 1 analysis, the cumulative impacts and the proposed action's contribution to cumulative impacts on regional transit capacity would be *not significant*.

Transit Operations Impacts

During the A.M. peak hour, Alternative 4 would require 7 additional transit vehicles on the same routes as Alternative 1, with the exception of the 28L-19th Ave/Geneva Limited route. During the P.M. peak hour, Alternative 4 would require 11 additional vehicles on the same routes as Alternative 1. As for Alternative 1, these transit vehicles would be in addition to those identified to maintain 2030 baseline conditions (16 vehicles in the A.M. peak hour and 16 vehicles in the P.M. peak hour). Impacts associated with Alternative 4 would be somewhat less than those for Alternative 1. **Mitigations 5 and 6** would also apply to Alternative 4. Because a feasibility study of the improvements contemplated in **Mitigation 5** would be required, implementation of **Mitigation 5** is uncertain. Since implementation of **Mitigation 6** alone, without **Mitigation 5**, might not be sufficient to reduce the impacts to a not significant level, the project impacts would *remain significant and unavoidable* with mitigation.

Although the alternative BRT route around Yosemite Slough would be technically feasible, it would not be an optimal configuration for a BRT system. BRT service would provide direct, fast, and reliable travel in a dedicated right-of-way, typically with signal priority for 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 a dedicated right-of-way and the most direct route between HPS and points to the west, including Candlestick point, the Bayshore Caltrain Station, and Balboa Park BART. Alternative 4 would not accommodate the BRT route on the bridge proposed with Alternative 1.

4.1.8.2.3 Factor 4: Bicycle Network and Circulation

Alternative 4 bicycle trips would be accommodated within the proposed street network for this alternative which would improve bicycle routes and access within the new development and thereby improve the bicycle network and circulation in the vicinity. See the Alternative 1 discussion of bicycle network and circulation impacts in Section 4.1.3.3.3, Bicycle Network and Circulation. Operational impacts associated with Factor 4 would be *beneficial*.

4.1.8.2.4 Factor 5: Pedestrian Circulation

Alternative 4 would improve sidewalks and the pedestrian network in the vicinity by ensuring adequate sidewalk widths and facilitating pedestrian circulation in areas not now served by such facilities. See the Alternative 1 discussion of Pedestrian Circulation impacts in Section 4.1.3.2.5, Pedestrian Circulation. Overall, impacts on pedestrian circulation associated with Factor 5 would be *beneficial*.

4.1.8.2.5 Factor 6: Emergency Access

Alternative 4 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. 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), and emergency vehicles would be able to utilize transit lanes when streets are congested. Therefore, the impacts of Alternative 4 on emergency access associated with Factor 6 would be *not significant*.

4.1.8.2.6 Factor 7: Loading Impacts

The loading impacts assessment associated with Alternative 4 is similar to the assessment completed for Alternative 1 (see Section 4.1.3.3.6, Loading Impacts). The proposed action would establish a minimum number of loading spaces; more could be provided as part of individual development projects. Table 4.1.8-4 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. Within HPS, the loading demand and estimated supply would be similar. Impacts related to loading operations with Alternative 4 would be *not significant*, and no mitigation is proposed.

Table 4.1.8-4. Summary of Alternative 4 Loading Demand and Supply

Project Site Area	*Daily Truck Generation*	*Peak Hour Loading Dock Space Demand*	*Supply*[a, b]
Hunters Point Shipyard	518	30	31

Notes:

a. Minimum number of loading spaces permitted per draft Design for Development standard for *CP-HPS Phase II Development Plan*.
b. Does not include stadium loading facilities.

Source: CHS Consulting Group, *et al*. 2009.

4.1.9 No Action Alternative

Under the No Action Alternative for the Transportation, Traffic, and Circulation resource impacts analysis, HPS would remain a closed federal property under caretaker status and would not be reused or redeveloped. Under this alternative, the DoN could continue the existing leases. Under this alternative, the 2030 cumulative condition would be the same as the 2030 baseline condition.

4.1.9.1 Construction Impacts

4.1.9.1.1 Factor 1: Construction Vehicle Traffic and Roadway Impacts

The No Action Alternative would have no significant impact on construction, and no mitigation is proposed.

4.1.9.2 Operational Impacts

4.1.9.2.1 Factor 2: Increase in Traffic Volumes

The No Action Alternative would have no significant impact on intersections and freeway facilities, and no mitigation is proposed.

4.1.9.2.2 Factor 3: Transit Impacts

The No Action Alternative would have no significant impact on local and regional transit capacity and on transit delay. No mitigation is proposed.

4.1.9.2.3 Factor 4: Bicycle Network and Circulation

The No Action Alternative would have no significant impact on bicycle circulation, and no mitigation is proposed.

4.1.9.2.4 Factor 5: Pedestrian Circulation

The No Action Alternative would have no significant impact on pedestrian circulation, and no mitigation is proposed.

4.1.9.2.5 Factor 6: Emergency Access

The No Action Alternative would have no significant impact on emergency access, and no mitigation is proposed.

4.1.9.2.6 Factor 7: Loading Impacts

The No Action Alternative would have no significant impact on loading operations, and no mitigation is proposed.

4.1.10 Overall Impact Summary

4.1.10.1 Impacts – Overall

Table 4.1.10-1 summarizes the impacts for all the alternatives assuming the 2030 baseline condition.

Table 4.1.10-1. Overall Impact Summary

Description		***Alternative***						
		1	**1A**	**2**	**2A**	**3**	**4**	**No Action**
Construction Vehicle Traffic and Roadway Impacts (Factor 1)		□	□	□	□	□	□	○
Increase in Traffic Volumes (Factor 2)								
Transportation Demand Management (TDM) Plan		□	□	□	□	□	□	○
Intersections								
#1002	Third St/Cesar Chavez St	●	●	●	●	●	●	○
#1003	Third St/Cargo Way	●	●	●	●	●	●	○
#1004	Third St/Evans Ave	●	●	●	●	●	●	○
#1006	Third St/Palou Ave	●	●	●	●	●	●	○
#1008	Third St/Carroll Ave	●	●	●	●	●	●	○
#1009	Third St/Paul Ave/Gilman Ave	●	●	●	●	●	●	○
#1016	Evans Ave/Cesar Chavez St	●	●	●	●	●	●	○
#1048	Jennings St/Middle Point Rd/Evans Ave	○	○	●	○	○	○	○
#1058	Evans Ave/Napoleon St/Toland St	●	●	●	●	●	●	○
#110	Innes Ave/Donahue St	○	○	○	○	○	○	○
#111	Donahue St/Galvez Ave	○	○	◉	○	○	○	○
#112	Donahue St/Lockwood St	○	○	○	○	○	○	○
#113	Crisp Rd/I St (Outer Ring Rd)	○	○	○	○	○	○	○
#114	Crisp Rd/Spear St (Inner Ring Rd)	○	○	○	○	○	○	○
#115	Robinson St/Spear Ave	◉	◉	◉	◉	◉	◉	○
#116	Lockwood St/Spear Ave	○	○	◉	○	○	○	○
Freeway Impacts (Factor 2) – Mainline								
US-101 NB, at the San Francisco County Line		○	○	○	○	○	○	○
US-101 SB, at the San Francisco County Line		○	○	○	○	○	○	○
San Francisco/Oakland Bay Bridge EB		○	○	○	○	○	○	○
San Francisco/Oakland Bay Bridge WB		○	○	○	○	○	○	○

Table 4.1.10-1. Overall Impact Summary

Description	*Alternative* 1	1A	2	2A	3	4	No Action
I-280 NB, south of US-101	○	○	○	○	○	○	○
I-280 SB, south of US-101	○	○	○	○	○	○	○
Freeway Impacts (Factor 2) – Ramps							
US-101 NB Off-ramp to Third St/Bayshore Blvd	●	●	●	●	●	●	○
US-101 NB On-ramp from Third St/Bayshore Blvd	○	○	○	○	○	○	○
US-101 NB Off-ramp to Bayshore Blvd/Cesar Chavez St	○	○	○	○	○	○	○
US-101 NB On-ramp from Bayshore Blvd/Cesar Chavez St	●	●	●	●	●	●	○
US-101 SB Off-ramp to Cesar Chavez St	○	●	●	●	●	●	○
US-101 SB Off-ramp to Bayshore Blvd/Third St	○	○	○	○	○	○	○
US-101 SB On-ramp from Bayshore Blvd/Third St	●	●	●	●	●	●	○
I-280 NB Off-ramp to Cesar Chavez St	○	○	○	○	○	○	○
I-280 NB On-ramp from Indiana St	●	●	●	●	●	●	○
I-280 SB Off-ramp to Pennsylvania Ave	●	●	●	●	●	●	○
Transit (Factor 3)							
Final Transit Plan	⦿	⦿	⦿	⦿	⦿	⦿	○
Capacity Utilization Cordon Screenlines	⦿	⦿	⦿	⦿	⦿	⦿	○
Capacity Utilization Downtown Screenlines	○	○	○	○	○	○	○
Capacity Utilization Regional Screenlines	○	○	○	○	○	○	○
Transit Delays	▣	▣	▣	▣	▣	▣	○
Bicycle Impacts (Factor 4)	○	○	○	○	○	○	○
Pedestrian Impacts (Factor 5)	○	○	○	○	○	○	○
Emergency Access (Factor 6)	○	○	○	○	○	○	○
Loading Impacts (Factor 7)	○	○	○	○	○	○	○
Stadium Football Games							
Traffic Impacts (Factors 1 - 2)	▣	▣	--	--	--	--	--
Transit Impacts (Factor 3)	▣	▣	--	--	--	--	--
Bicycle Impacts (Factor 4)	○	○	--	--	--	--	--
Pedestrian Impacts (Factor 5)	○	○	--	--	--	--	--
Emergency Access (Factor 6)	○	○	--	--	--	--	--
Loading Impacts (Factor 7)	○	○	--	--	--	--	--
Secondary Stadium Events							
Traffic Impacts (Factors 1 - 2)	▣	▣	--	--	--	--	--
Transit Impacts (Factor 3)	▣	▣	--	--	--	--	--
Bicycle Impacts (Factor 4)	○	○	--	--	--	--	--
Pedestrian Impacts (Factor 5)	○	○	--	--	--	--	--
Emergency Access (Factor 6)	○	○	--	--	--	--	--
Loading Impacts (Factor 7)	○	○	--	--	--	--	--

Notes:
● - Significant and unavoidable
▣ - Significant and unavoidable with mitigation
⦿ - Not significant with mitigation
○ - Not significant
Source: CHS Consulting Group, *et al*. 2010.

4.1.10.2 Mitigation

Mitigation measures proposed to reduce potentially significant impacts associated with the proposed action and alternatives, and the significance of the impact after mitigation, are described in Table 2.4-1.

4.2 Air Quality and Greenhouse Gases

The following section presents impacts to air quality and climate change that would occur from implementation of the project alternatives, as well as feasible mitigation measures that would reduce or avoid identified impacts. Included in this section are discussions of the significance factors and methods used to evaluate proposed impacts.

4.2.1 Methodology

4.2.1.1 Significance Factors

The following factors were used for NEPA purposes to determine the significance of proposed air quality and GHG impacts. The significance thresholds of criteria pollutants rely on guidelines developed by the BAAQMD for use by lead agencies to evaluate air quality impacts from projects and plans proposed in the San Francisco Bay Area Air Basin (SFBAAB) (BAAQMD 2011). These guidelines are based on requirements that proposed actions comply with applicable federal, state, and local air pollution standards and regulations. These criteria are organized according to the BAAQMD's checklist, and unless otherwise identified, they follow the thresholds recommended by the BAAQMD.

4.2.1.1.1 Criteria and Toxic Air Pollutants

Factors considered in determining whether an alternative would have significant impacts on air quality include the extent or degree to which the implementation of an alternative would:

During Construction

Factor 1 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard (including the release of emissions that exceed quantitative thresholds for ozone precursors);

- The BAAQMD uses the following mass emission thresholds to determine the significance of combustive emissions from proposed construction activities: 1) 54 pounds per day (ppd) of reactive organic gas (ROG), nitrogen oxides (NO_x), or fine particulate matter ($PM_{2.5}$), and 2) 82 ppd of respirable particulate matter (PM_{10}); and

- Project operational emissions that exceed any of the following BAAQMD emission thresholds would be considered significant. Projects that exceed these thresholds also would produce cumulatively considerable contributions to cumulative air quality impacts: 1) 54 ppd or 10 tons per year (tpy) of ROG, NO_x, or $PM_{2.5}$, and 2) 82 ppd or 15 tpy of PM_{10}.

Factor 2 Expose sensitive receptors to substantial pollutant concentrations;

- Project alternatives would expose the public to significant levels of toxic air contaminants (TACs) if they result in 1) a maximum cancer risk greater than 10 in one million (10×10^{-6}), or 2) a non-cancer (chronic or acute) Hazard Index (HI) that is greater than 1.0;
- The BAAQMD threshold of significance for determining impacts associated with localized exposures to $PM_{2.5}$ is 0.3 microgram per cubic meter ($\mu g/m^3$);
- A project alternative would have a cumulative impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000-ft radius from the fence line of a source, or from the location of a receptor, plus the contribution from the project, exceeds the

following: 1) a maximum cancer risk greater than 100 in one million (100 x 10^{-6}), or 2) a non-cancer (chronic) HI that is greater than 10. Thresholds for new receptors are effective 1 May 2011; and

- The BAAQMD thresholds of significance for determining impacts associated with cumulative health hazards exposures to $PM_{2.5}$ are 0.8 μg/m^3.

During Operation

The air quality analysis uses Factors 1 and 2 above to evaluate the effects of proposed construction emissions. Factors 1 and 2 also apply to operational emissions. Factors 3 through 5 below only relate to effects of proposed operations, addressing whether the operation of each alternative would:

Factor 3 Violate an air quality standard or contribute substantially to an existing or projected air quality violation;

Factor 4 Conflict with or obstruct implementation of the applicable air quality plan; and

Factor 5 Create objectionable odors affecting a substantial number of people.

4.2.1.1.2 GHGs

The BAAQMD environmental checklist includes consideration of the following effects from proposed greenhouse gas (GHG) emissions:

Factor 1 Generate greenhouse gas emissions, either directly or indirectly, that may have adverse impacts on the environment;

- DoN has not adopted a significance threshold for proposed GHG emissions, as there are no formally adopted or published NEPA thresholds of significance for GHG emissions. Formulating such thresholds is problematic, as it is difficult to determine what level of proposed emissions would substantially contribute to global climate change. Therefore, in the absence of an adopted or science-based NEPA significance threshold for GHGs, this SEIS compares GHG emissions that would occur from a project alternative to the U.S. GHG baseline inventory of 2009 (USEPA 2011) to determine their relative increases and contributions to climate change.

Factor 2 Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing emissions of GHGs;

- Proposed emissions of GHGs would be considered significant if they conflict with 1) the goal of the California Global Warming Solutions Act of 2006 (AB 32) to reduce GHG emissions in California to 1990 levels by 2020, or 2) the San Francisco *Climate Action Plan*, such that it would impede implementation of the local GHG reduction goals established by the 2008 Greenhouse Gas Reduction Ordinance.

4.2.1.2 Analytic Method

The following text presents the methods used to evaluate impacts due to criteria pollutants, TACs, and GHGs from proposed construction and operational emissions. Proposed operational impacts are compared to the project site 2007 No Action Alternative (NAA) baseline conditions evaluated by the air quality resource in the *Candlestick Point-Hunters Point Shipyard Phase II Development Plan Final EIR* (SFRA 2010). This baseline scenario is defined as emitting nearly zero emissions of air pollutants and GHGs. An evaluation of proposed operational impacts consistent with the project site 1993 NAA scenario evaluated in the 2000 FEIS was also performed and is presented in Appendix M of this SEIS. In comparison to the 2007 NAA scenario used for this SEIS analysis, the 1993 NAA has higher emissions since it is assumed that under the 2007 NAA, the portion of HPS proposed for development under the Stadium Plan and Non-Stadium Alternatives would not be disposed of, nor would it be redeveloped and would remain a closed federal property under caretaker status. Therefore, while the impacts evaluated based on a 1993 NAA would be marginally lower than those described herein using a 2007 NAA, they are broadly consistent with each other.

4.2.1.2.1 Criteria and Toxic Air Pollutants

Construction

Air quality impacts from proposed construction activities would occur from combustive emissions due to the use of fossil fuel-fired construction equipment and on-road trucks and fugitive dust ($PM_{10}/PM_{2.5}$) emissions from earth-moving activities, the use of vehicles on bare soils, and demolition of structures. Proposed construction activities would include asbestos and lead paint abatement inside buildings, demolition, grading, excavation, and foundation and structure construction.

Data on equipment usages proposed for construction of the proposed action were used in the SEIS to estimate the daily construction emissions (*DEIR Appendix H2, MACTEC Construction Workers and Equipment Resources*, 1 October 2009 and *DEIR Appendix S, ENVIRON Climate Change Technical Report*, 22 October 2009, of the *Candlestick Point-Hunters Point Shipyard Phase II Draft EIR* [SFRA 2009]). The city revised the phasing schedule in the EIR (SFRA 2010) such that all sub-phases will start at the same time or later than that designated in the draft EIR, and in most cases, construction activities on each sub-phase will start later than what was evaluated under the draft EIR. The revised schedule would extend the construction impacts for a longer duration than that analyzed in the SEIS, and it will slightly reduce the average daily impacts. While the phasing has shifted, no changes to the equipment resources were needed for each sub-parcel area of the proposed action, and the equipment resources were used with the existing phasing schedule for criteria pollutant impacts. Criteria pollutants were calculated for construction activities for Alternative 1 using the California Air Resources Board (ARB) OFFROAD 2007 model and land use designations and magnitudes identified in Section 2.5 of this SEIS. Criteria pollutant emissions for the construction of all other project alternatives were estimated from the magnitude of their construction needs relative to Alternative 1. Appendix J Tables J-9A through J-17 present the emission calculations for proposed construction activities.

In addition to the off-road construction equipment emissions, criteria pollutant impacts from material hauling, including fill-material transport, were calculated using truck trips and trip mileage estimated in the EIR (*Appendix A5, Attachment 3, Table 3-4, ENVIRON, Updated Project Phasing Effect on Air Quality and Climate Change Analyses* [SFRA 2010]) and ARB Emission Factor Model (EMFAC2007) for on-road heavy duty trucks. Appendix J Tables J-9B, J-11, and J-17 present the emission calculations for these activities.

The construction impact analysis assumes that proposed construction activities would implement all fugitive dust control measures recommended by the BAAQMD in their *CEQA Air Quality Guidelines*, including all Basic and Additional Construction Mitigation Measures (BAAQMD 2011). The BAAQMD estimates that implementation of the Basic and Additional Construction Mitigation Measures would reduce uncontrolled fugitive PM dust emissions by 75 percent (*CEQA Air Quality Guidelines Appendix B*). In addition, proposed construction activities would comply with the dust control measures required in the *San Francisco Health Code* Article 22B, Construction Dust Control. All proposed fugitive dust controls would be documented in a project dust control plan (DCP) that would be approved by the BAAQMD and the San Francisco Department of Public Health (DPH) prior to initiations of ground disturbing activities at the project site. It is expected that monitoring to ensure strict compliance with both the DPH and BAAQMD requirements in the DCP would produce a fugitive dust control efficiency of over 90 percent.

Operation

Proposed operations would generate criteria pollutant emissions from onsite area sources (such as combustion of natural gas for space and water heating and other fuels for building and grounds maintenance equipment) and vehicles that access the project site. Area source emissions were estimated with the use of the Urban Emissions (URBEMIS2007) model (Rimpo and Associated Inc. 2008) and based on the land use designations and magnitudes identified in Section 2.5 of this SEIS. Traffic data used to estimate vehicular emissions were obtained from the Transportation Study in Section 4.1. Emission factors from the EMFAC2007 model were applied to these data to estimate vehicular emissions. Appendix J of this SEIS presents the calculations of proposed emissions.

The analysis conservatively assumes that all trips generated by the project alternatives would be new trips within the SFBAAB, although some of these trips would likely occur in the region without the proposed development. Thus, emission estimates for the project alternatives represent a conservative analysis of potential new emissions from mobile sources. Each project alternative would incorporate features intended to reduce motor vehicle trips, including a dense, compact development with mixed land uses that would facilitate pedestrian, bicycle, and transit travel. Vehicular traffic generated by the project alternatives would be substantially greater without these trip-reduction features.

The potential for carbon monoxide (CO) emissions from proposed traffic to impact ambient CO levels was evaluated by inferring from the CO analysis performed for the EIR proposed action scenario, as found in *Appendix H1, PBS&J Air Quality Model Input/Output*, July 2009 (SFRA 2009). This analysis used the California Department of Transportation California Line Source Dispersion Model (CALINE4) to evaluate local CO concentrations at receptors near four intersections in the adjacent Bayview residential neighborhood (Caltrans 1989). These intersections were selected because they represent locations where proposed traffic would produce the greatest increases in congestion and associated CO emissions within the project vicinity. The CALINE4 analysis used CO background concentrations recorded between 2006 and 2008 at the BAAQMD station nearest to the project site (the Arkansas Street station on Potrero Hill) to describe background CO concentrations for the 2030 analysis year. Use of these data is a conservative approach, as the ARB predicts that CO emissions within the SFBAAB will continue to decrease from current levels through 2020. Background CO concentrations were added to CO impacts estimated by CALINE4 for proposed traffic to produce total proposed CO impacts. This analysis is based upon the impact of traffic generated from the proposed HPS and Candlestick Point sites, or 78,109 average daily trips (ADT). The project alternatives evaluated in this SEIS would generate substantially less traffic and fewer resulting CO emissions/impacts compared to this scenario.

4.2.1.2.2 Toxic Air Contaminants

Construction

A human health risk assessment (HHRA) was conducted to evaluate the human health effects from proposed construction emissions of diesel particulate matter (DPM) and TAC-containing fugitive dust. This analysis was deemed appropriate due to the scale (multi-year time horizon utilizing extensive construction equipment over a large area) and state of the project site (redevelopment of a brown field that contains residual chemicals in the soil).

The methods used to analyze human health effects from emissions of DPM and TAC-containing PM_{10} associated with proposed construction activities were consistent with the risk assessment guidelines of the BAAQMD, the California Environmental Protection Agency (Cal/EPA), and USEPA. The analysis incorporates conservative (i.e., health-protective) methodologies for 1) the estimation of emissions, 2) the calculation of airborne concentrations of either DPM or TACs bound to soil at receptor locations, and 3) the estimation of excess lifetime cancer risks and non-cancer health effects. Details of these analyses are found in *DEIR, Volume V, Appendix H3, ENVIRON Ambient Air Quality and Human Health Risk Assessment*, October 2009 (SFRA 2009) and *FEIR Volume X, Appendix H3, ENVIRON Ambient Air Quality and Human Health Risk Assessment, May 2010* (SFRA 2010).

Cancer risks and non-cancer effects were evaluated for offsite receptors within the project vicinity, including residents (child and adult), workers, and other sensitive receptors (e.g., schoolchildren). The analysis domain included the expected travel routes of on-road delivery and haul trucks in the surrounding community, proposed residential locations within the project site, and children attending schools to the west of the project site.

Airborne concentrations of DPM and TACs bound to soil were estimated at receptor locations using the emissions estimates and the USEPA air dispersion model American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), version 07026. Based on the results of the exposure evaluation and air dispersion modeling, the analysis quantified excess lifetime cancer risks and non-cancer health effects. The methods used to estimate excess lifetime cancer risks and non-cancer effects are consistent with risk assessment guidance from BAAQMD, Cal/EPA, and USEPA.

For the purposes of conducting the HHRA of DPM, Alternative 1, including construction of a new stadium, would require the longest construction period and the heaviest use of construction equipment. Therefore, of any project alternative, Alternative 1 would produce the greatest potential human health risks from construction activities. Thus, it is expected that the exposures and health risks estimated for construction of any other project alternative would be less than those estimated for Alternative 1.

Operation

Based on the types of land uses proposed for the project alternatives, substantial emissions of TACs would likely only occur within areas designated for R&D uses. Since a wide range of activities could occur within an R&D land use area, it is difficult to predict the exact types of stationary sources and emission quantities from these activities. However, any new emission sources that are added as a result of the project alternatives would need to comply with any applicable NESHAP regulations and the MSAT program requirements. For assessing health impacts, a conservative scenario was developed that would represent aggregate emissions from all future TAC emission sources within the proposed R&D land use areas. These estimates were then used to evaluate potential impacts at surrounding receptor locations. Details regarding this HHRA are found in *DEIR, Volume V, Appendix H3, Attachment III* (SFRA 2009) and *FEIR, Volume X, Appendix H3* (SFRA 2010).

This screening-level analysis made a series of conservative assumptions:

- A wide range of stationary sources would operate in the R&D area; thus, the identity and amounts of the TACs emitted from these sources cannot be determined accurately at this time;
- In order to approximate the maximum potential number of facilities with TAC emitting sources, the area designated for proposed R&D development would be divided into 1-ac plots, which is consistent with the minimum size of a parcel based on the expected land uses within the R&D parcels;
- A single R&D facility, or a stationary source such as a collection of sources like boilers or emergency generators, would occur on each 1-ac plot and would emit chemicals at maximum

allowable rates. This is a conservative approach since some of these locations, such as office buildings, would have substantially lower or near zero TACs emission rates;

- The cancer risk at the boundary of each 1-ac plot was set to not exceed a designated cancer risk level or chronic non-cancer HI threshold (in this case a residential cancer risk of 10 in one million and a chronic non-cancer HI of 1.0, in accordance with BAAQMD thresholds of significance);
- Receptor locations extended about 500 m (about a third of a mile) beyond the R&D land use areas. Impacts would be lower beyond this distance; and
- It was conservatively assumed that all receptor locations surrounding the R&D area were residential (as exposure frequency/duration and resulting exposures and risks for other populations would be less, compared to a residential receptor).

The scenario evaluated in this HHRA assumes a total of 5 million ft^2 (464,515 m^2) of R&D land use, or the maximum amount proposed for any project alternative (Alternative 2). Therefore, it is expected that if exposures and associated health risks estimated for Alternative 2 were below health risk significance thresholds, the risks associated with the operation of all project alternatives also would be below the significance thresholds.

The HHRA did not evaluate non-cancer acute effects from proposed operations, as it would be highly unlikely that all emission sources within the R&D use areas would simultaneously operate at their maximum emission rate (for any single hour) and result in potentially high acute health effects. Therefore, it is expected that proposed operations would produce less than significant non-cancer acute effects.

$PM_{2.5}$

The potential for $PM_{2.5}$ emissions from proposed traffic to impact ambient $PM_{2.5}$ levels and public health were evaluated by inferring from the $PM_{2.5}$ analysis performed for the EIR proposed action scenario. According to the BAAQMD, "emissions from a new source or emissions affecting a new receptor would be considered significant where ground-level concentrations of $PM_{2.5}$ from any source would result in an average annual increase greater than 0.3 $\mu g/m^3$," which is derived from the proposed USEPA Significant Impact Level for stationary sources. The BAAQMD concluded, based on an ARB study (ARB 2005), that an increase in mortality from a 0.3 $\mu g/m^3$ increment of $PM_{2.5}$ was consistent with the estimated increase in mortality assumed by the San Francisco Department of Public Health (DPH), an increment of 0.2 $\mu g/m^3$ (DPH 2008). For cumulative analyses BAAQMD recommends a cumulative threshold for $PM_{2.5}$ of 0.8 $\mu g/m^3$, which is the mid-range value of the Significant Impact Level proposed by the USEPA.

Based on these proposed thresholds, the most stringent limit of 0.2 $\mu g/m^3$ was chosen as a conservative action level for judging significance in this analysis.

This analysis is based on the impact of traffic generated from the proposed HPS and Candlestick Point sites, or 78,109 ADT. The project alternatives evaluated in this SEIS would generate substantially less traffic and resulting $PM_{2.5}$ emissions compared to this scenario. Details of the analysis are presented in *DEIR, Volume V, Appendix H3* (SFRA 2009), and *FEIR Volume X, Appendix H3* (SFRA 2010).

Emissions from proposed vehicle exhaust, tire wear, and brake wear were estimated using EMFAC 2007 and modified to account for emission reduction regulations recently implemented by the ARB which have not yet been incorporated into the model. Vehicle traffic data were obtained from the project transportation analysis.

The analysis evaluated exposure point concentrations at residential receptors surrounding the following thoroughfares and roadways: 1) Third Street; 2) Innes Avenue/Hunters Point Boulevard/Evans Avenue; 3) Palou Avenue; 4) Gilman Avenue/Paul Avenue; 5) Jamestown Avenue; 6) Ingerson Avenue; and 7) Harney Way. These thoroughfares would connect the project site and major arterials to U.S. Highway 101 or downtown San Francisco. Innes Avenue/Hunters Point Boulevard/Evans Avenue and Harney Way were identified as streets with substantial truck traffic and thus would produce more $PM_{2.5}$ emissions compared to other roads. Palou Avenue and Gilman Avenue/Paul Avenue were evaluated, as there are residences in the vicinity of these roads where individuals may incur exposure to $PM_{2.5}$. Jamestown and Ingerson Avenues were evaluated in a semi-quantitative manner, as they are immediately adjacent to residences, but they would have much lower project-related vehicle traffic than Palou and Gilman/Paul Avenues.

The ambient concentrations of $PM_{2.5}$ produced from proposed traffic emissions were estimated with the use of the Gaussian air dispersion model, CAL3QHCR, which is approved by the USEPA and ARB for the evaluation of transportation projects. The analysis evaluated both free flowing traffic and queuing conditions at intersections.

4.2.1.2.3 GHGs

Implementation of the project alternatives would result in emissions of GHGs due to 1) construction activities, 2) changes in vegetation sequestration capacity, 3) area sources (such as combustion of natural gas for space and water heating and other fuels for building and grounds maintenance equipment), 4) indirect operational sources (such as the generation of offsite electricity for use on site and decomposition of solid wastes), and 5) vehicles that access the project site. The following passages provide descriptions of the methods used to estimate proposed GHG emissions. Appendix J of the SEIS presents the calculations of proposed construction GHG emissions.

The potential effects of proposed GHG emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, the impact of proposed GHG emissions to climate change is treated as a cumulative impact. In regard to the evaluation of GHG Significance Factor 1, GHG emissions from each project alternative are compared to the U.S. GHG baseline inventory of 2007 as a means of determining their relative increases and contributions to climate change. In regard to the evaluation of GHG Significance Factor 2 for GHG, the analysis estimates GHG emissions for a No Action Taken (NAT) scenario and compares these emissions to each project alternative to show that proposed emissions would not conflict with local and state GHG reduction strategies.

Construction

The OFFROAD2007 and the EMFAC2007 models were used to generate GHG emission factors data for the usage of construction equipment and on-road delivery trucks, respectively (ARB 2006a and 2006b). The emission factors from the OFFROAD2007 and EMFAC2007 models were used to estimate emissions from several types of construction activities germane to the project, including earthmoving, demolition, and paving. Assumptions regarding construction equipment usage and construction timing are based on the magnitudes of proposed construction activities. Issues related to building preservation were also taken into consideration for construction activity.

Operations

Proposed GHG emissions were estimated using methodologies established by the California Climate Action Registry (CCAR), the Intergovernmental Panel on Climate Change (IPCC), and other government agencies, as documented in *Appendix S (Climate Change Technical Report)* of the *DEIR, Volume VI*

(SFRA 2009) and *FEIR, Volume X, Appendix T5* (SFRA 2010). Data from several special studies were used to define proposed activities; such studies were commissioned by the California Energy Commission (CEC) on energy use patterns associated with municipal activities and natural resource distribution.

The GHG emissions estimated for each project alternative incorporate existing regulations and standards for development and operations, plus several conceptual project design features that would result in lower GHG emissions compared to existing standards. However, since there could be modifications during the entitlement and development process, these have been incorporated as environmental controls so that the future developer or owner of the property would include these critical features.

The GHG emission estimates were prepared as a worst-case analysis, as it assumed that all emissions from a project alternative otherwise would not occur as part of another development plan within the region. In addition, the analysis assumed no reductions in future years due to factors such as future regulations or increasing costs of energy. This scenario is not expected because measures proposed by AB 32, for example, would reduce future GHG emissions from existing development.

SOURCE OPERATIONAL ASSUMPTIONS

The following proposed design features were evaluated for their potential to reduce GHG emissions:

- Provide neighborhood-serving retail;
- Provide automobile, public transportation, and pedestrian connections between the project site and the surrounding community;
- Provide an urban design that would reduce its footprint and allow for transportation and open space corridor;
- Integrate land use patterns with multimodal street networks that would facilitate walking and cycling for internal trips, and transit for trips of greater distance;
- Extend existing Muni routes to better serve the project site and region; increase the service on existing routes to provide more capacity; and complement these routes with new transit facilities and routes that would serve the proposed land use program and transit demand;
- Plant up to 5,000 net new trees at the project site and surrounding community;
- Exceed the 2008 Standards for Title 24 Part 6 energy efficiency standards for homes and businesses by at least 15 percent;
- Install ENERGY STAR appliances, where appliances are offered by homebuilders;
- Use energy efficient street lighting; and
- Preserve Building 208.

This project has voluntarily committed to constructing all project buildings to the LEED® for Neighborhood Development Gold standard based on the Pilot Version of the rating system released in June 2007.

The project site would follow all applicable regulations and ordinances in existence at the time of construction, such as:

- Non-approved types of wood-burning stoves and fireplaces are prohibited; and
- Residential and non-residential buildings must follow the *Green Building Code* [Title 24 Part 11].

The following assumptions were used to calculate emissions for specific sources of GHGs:

- Electricity and natural gas usages for residential buildings were based on data in the California Statewide Residential Appliance Saturation Survey, commissioned by the CEC (CEC 2004). Electricity and natural gas usages for non-residential buildings were based on data in the California Commercial End-Use Survey (CEUS) for all building types except for the Stadium (CEC 2006);
- Natural gas fireplaces would occur in up to 10 percent of new residential units. Annual energy use was determined by the number of fireplaces, the average energy use of each fireplace, and the URBEMIS2007 model default fireplace usage rate value of 200 hours/year;
- Activity data used to estimate GHG emissions from municipal sources, including drinking water, wastewater supply and treatment, lighting in public areas, and vehicles were based on data from special studies;
- All emission factors used to calculate GHG emissions from indirect electricity usage were based on the *PG&E Power/Utility Reporting Protocol* report of 2007 and adjusted to incorporate the 20 percent Renewable Portfolio Standard required by 2010;
- Solid waste diverted to landfills was based upon amounts reported by the Center for Integrated Waste Management Board (CIWMB) (CIWMB 1999, 2006, and 2007). The waste disposal rates were multiplied by the non-biogenic emissions associated with the Altamont Landfill in 2005 which is 0.00674 tons of carbon dioxide equivalent (CO_2e) emissions per metric ton of waste per year (SFRA 2010);
- Vehicular traffic patterns, trip rates, and trip lengths are based upon information from the project Transportation Study (Section 4.1), which incorporates design features that would minimize traffic generation from each project alternative. The distribution of residential trip types follows the Metropolitan Transportation Commission (MTC) 2030 model defaults. Average trip lengths were based upon data from the Caltrans Household Travel Survey for San Francisco County. The CO_2 emissions from mobile sources were calculated with emission factors from EMFAC2007, and then adjusted to account for GHG reductions implemented through Pavley (Clean Car) Vehicle Standards;
- Emissions from the transit buses that would serve the project site were based on a fleet of diesel-hybrid buses that use B20 (20 percent biodiesel, 80 percent petroleum diesel); and
- The future developer or owner of the property would plant about 5,000 net new trees at the project site and nearby community, and its effect would sequester about 3,500 mt of CO_2.

4.2.2 Alternative 1: Stadium Plan Alternative

4.2.2.1 Construction Impacts

4.2.2.1.1 Criteria and Toxic Air Pollutants

Factor 1: Construction of Alternative 1 would result in emissions that exceed BAAQMD significance criteria.

Air quality impacts from proposed construction activities would occur from combustive emissions due to the use of fossil fuel-fired construction equipment and on-road trucks and fugitive dust (PM_{10}/$PM_{2.5}$) emissions from earth-moving activities, the use of vehicles on bare soils, and demolition of structures. According to the BAAQMD, PM_{10} in the form of fugitive dust is one of the pollutants of greatest concern with respect to construction-related emissions. Although heavy-duty equipment, material transport, and employee commutes would result in combustive emissions, these emissions are included in the regional emissions inventory, which serves as the basis for the air quality plans, and are not expected to impede attainment of the ambient air quality standards in the SFBAAB. Table 4.2.2-1 summarizes the combustive emissions estimated for construction of Alternative 1. These data show that only emissions of NO_x from construction of Alternative 1 would exceed a daily emission significance threshold.

Table 4.2.2-1. Average Daily Combustive Emissions Produced from Construction of Alternative 1

Activity	Daily Emissions (Pounds per Day)			
	ROG	*NO_x*	*PM_{10}*	*$PM_{2.5}$*
Average Construction Day	33	167	8	7
BAAQMD Significance Threshold	**54**	**54**	**82**	**54**
Exceeds BAAQMD Threshold?	**No**	**Yes**	**No**	**No**

Environmental Controls

To minimize fugitive dust emissions during construction, the construction contractor would implement feasible dust control measures required by *San Francisco Health Code* (Article 22B) and the BAAQMD. The construction contractor would document all proposed environmental controls in a project dust control plan (DCP). The DCP would be submitted to and approved by the DPH and the BAAQMD prior to the beginning of construction and the site operator must ensure the implementation of all specified dust control measures throughout the construction project. The DCP would require compliance with the following specific mitigation measures to the extent deemed necessary by the DPH to achieve no visible dust at the property boundary:

- Submission of a map to the Director of Health showing all sensitive receptors within 1,000 ft of the site;
- Keep all graded and excavated areas, areas around soil improvement operations, visibly dry unpaved roads, and parking and staging areas wetted at least three times per shift daily with reclaimed water during construction to prevent visible dust emissions from crossing the property line. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour;
- Analysis of wind direction and placement of upwind and downwind particulate dust monitors;
- Record keeping for particulate monitoring results;
- Requirements for shutdown conditions based on wind, dust migration, or if dust is contained within the property boundary but not controlled after a specified number of minutes;
- Establishing a hotline for surrounding community members who may be potentially affected by Project-related dust. Contact person would respond and take corrective action within 48 hours. Post publicly visible signs around the site with the hotline number as well as the phone number of the BAAQMD and make sure the numbers are distributed to adjacent residents, schools, and businesses;
- Limiting the area subject to construction activities at any one time;
- Installing dust curtains and windbreaks on windward and downwind sides of the property lines, as necessary. Windbreaks on windward side should have no more than 50% air porosity;
- Limiting the amount of soil in trucks hauling soil around the job site to the size of the truck bed and securing with a tarpaulin or ensuring the soil contains adequate moisture to minimize or prevent dust generation during transportation;

- Enforcing a 15 mph speed limit for vehicles entering and exiting construction areas;
- Sweeping affected streets with water sweepers at the end of the day;
- Hiring an independent third party to conduct inspections for visible dust and keeping records of those inspections;
- Minimizing the amount of excavated material or waste materials stored at the site; and
- Prevent visible track out from the property onto adjacent paved roads. Sweep with reclaimed water at the end of each day if visible soil material is carried out from property.

Compliance with these control requirements would reduce fugitive dust emissions from construction by at least 90 percent. However, combustive emissions would still exceed the NO_x daily significance threshold.

Since construction of Alternative 1 would exceed the daily emission significance threshold for NO_x, the lead agency would consider all feasible environmental controls to reduce these emissions to insignificance. One of the most feasible controls for this purpose would be to use a construction equipment fleet that has a high percentage of new equipment, as they have the most current and stringent emission standards. In addition, use of engine exhaust after-treatment devices is also a feasible control to minimize NO_x emissions from construction equipment. As discussed below for Factor 2, 50 percent of the proposed construction equipment fleet would meet USEPA Tier 2 standards and would be outfitted with particulate matter controls. However, given the large magnitude of proposed construction activities, it would be difficult to reduce proposed construction emissions to below the daily NO_x significance threshold. Therefore, NO_x emissions from construction activities under Alternative 1 *would be significant,* whereas ROG, PM_{10}, and $PM_{2.5}$ emissions from construction would *not be significant* as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause any substantial changes in the construction criteria pollutant emissions from those described for Alternative 1, and the impacts *would be significant* for NO_x emissions but *not significant* for ROG, PM_{10}, and $PM_{2.5}$ emissions as related to Factor 1.

Factor 2: Construction of Alternative 1 would not expose sensitive receptors to substantial pollutant concentrations.

The following text summarizes the results of an HHRA performed for Alternative 1 in the EIR (SFRA 2010) which evaluated potential public health impacts from: 1) DPM that would emanate from heavy equipment used in construction; and 2) the release of TACs bound to contaminated soil or fugitive dust. The HHRA in the EIR separately evaluated impacts of these pollutants, whereas the following presents a combined assessment of their effects.

The HHRA evaluated diesel-powered off-road construction equipment and on-road trucks that transport construction materials between the project site and the nearest freeways. The analysis assumed that proposed construction equipment would accelerate a phase-in of emission control technologies in advance of regulatory requirements, such that 50 percent of the fleet would meet USEPA Tier 2 standards outfitted with ARB Level 3 Verified Diesel Emissions Control Strategies (VDECS) for particulate matter control during the first two years of construction activities, increasing to 75 percent of the fleet in the third year and 100 percent of the fleet starting the fourth year and for the duration of the Project. Since the HHRA did not conduct an unmitigated analysis, these assumptions are incorporated into the project as environmental controls.

Consistent with the evaluation of proposed fugitive dust emissions under Factor 1 above, the HHRA assumed implementation of a DCP approved by the BAAQMD and DPH. In addition, the analysis assumed implementation of environmental controls to minimize TAC emissions associated with fugitive dust, such as the asbestos dust mitigation plan (ADMP) proposed in Section 4.7 of this SEIS.

Potential exposures to DPM and soil-bound chemicals from proposed construction activities were evaluated for offsite receptors in the project vicinity (adult and child residents, workers, and schoolchildren). Based on the results of the exposure evaluation and air dispersion modeling, the HHRA quantified estimates of excess lifetime cancer risks and non-cancer health effects to the public.

The HHRA determined that the maximum cancer risks produced by both DPM emissions and chemicals bound to air-bound dust would be 3.8 and 0.01 per million, respectively. These impacts represent the maximum levels of cancer risks that would occur at any offsite receptor during proposed construction activities. These impacts would occur at different locations. Therefore, the maximum excess lifetime cancer risk for offsite receptors produced by Alternative 1 construction activities would not exceed 3.81 per million. This impact would not exceed the cancer risk significance threshold of 10 per million.

The HHRA determined that the maximum non-cancer chronic and acute HIs produced by DPM emissions and chemicals bound to airborne dust would be 0.01 and 0.03, respectively. These impacts represent the maximum levels of non-cancer effects that would occur at any offsite receptor during proposed construction activities. These impacts would occur at different locations. Therefore, the maximum public non-cancer effects produced by Alternative 1 construction activities would not exceed the combined impacts of these two pollutants, or an HI of 0.04. This impact would not exceed the HI significance threshold of 1.0.

Since the impacts of DPM emissions and chemicals bound to airborne dust from construction of Alternative 1 would not exceed any significance threshold, they would not expose sensitive receptors to substantial pollutant concentrations. As a result, construction emissions impacts from Alternative 1 would not be significant as related to Factor 2 with implementation of the environmental control described below and an approved DCP and ADMP.

Environmental Controls

INSTALL EMISSION CONTROL DEVICES ON DIESEL-POWERED ONSITE CONSTRUCTION EQUIPMENT

To reduce DPM emissions during proposed construction, the construction contractor would utilize emission control technologies such that: 1) 50 percent of the off-road construction equipment fleet meet USEPA Tier 2 non-road standards and implement ARB Level 3 Verified Diesel Emission Control Strategies (VDECS) for particulate matter control (or equivalent) during the first two years of construction activities; 2) increase the requirements of #1 to 75 percent of the construction fleet in the third year; and 3) increase the requirements of #1 to 100 percent of the construction fleet starting in the fourth year and thereafter. Implementation of environmental controls and an approved DCP and ADMP would help ensure that public health impacts from construction of Alternative 1 would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1 would not cause any substantial changes in construction toxic air contaminant emissions from those described for Alternative 1, as similar environmental controls would be applied. The health risks would be similar to those from Alternative 1 and would *not be significant* as related to Factor 2.

4.2.2.1.2 GHGs

Factor 1: Emissions of GHGs from the construction of Alternative 1 would not produce significant impacts to the environment.

Table 4.2.2-2 summarizes the total GHG emissions that would occur from Alternative 1. These data show that proposed construction equipment would emit a total of 63,854 mt of CO_2e emissions over a construction period of 16 years, or an average of 3,991 mt per year.

In the absence of an adopted or science-based NEPA significance threshold for GHGs, this SEIS compares GHG emissions that would occur from the construction of Alternative 1 to the U.S. GHG baseline inventory of 2009 (USEPA 2011) to determine the relative increase in proposed GHG emissions. Table 4.2.2-2 shows the annual CO_2e emissions that would occur from construction of Alternative 1. Therefore, the ratio of CO_2e emissions from construction of Alternative 1 to the net sources in the U.S. in 2009 is approximately 0.06/6,957 million mt, or about 0.0001 percent of the U.S. CO_2e emissions inventory. Since GHG emissions from Alternative 1 would equate to such a minimal amount of the U.S inventory, they would not substantially contribute to global climate change. Therefore, GHG emissions from construction of Alternative 1 would result in *no significant impacts* to the environment as related to Factor 1. Because impacts would not be significant, no mitigation is proposed.

Table 4.2.2-2. Alternatives 1 and 1A Construction – Total CO_2e Emissions (mt)

Location	*Construction Equipment*	*Worker Commuting*	*Hauling*	*Total GHG Emissions*	*U.S. 2008 Inventory ($x\ 10^6$)*	*% of U.S. Emissions*
Hunters Point Shipyard	42,895	2,734	18,226	*63,854*	*6,957*	*0.0001*

Sources: SFRA 2010; USEPA 2010.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause any substantial changes in construction GHG emissions from those described for Alternative 1, and the impacts would *not be significant* as related to Factor 1.

Factor 2: Construction of Alternative 1 would not conflict with adopted plans or policies to reduce emissions of GHGs.

The ARB implements regulations that limit the idling of diesel-powered on- and off-road vehicles and equipment (13 CCR 2480 and 2485) and they would limit GHG emissions from these proposed construction sources. The Early Action Measures (EAMs) pursuant to AB 32 took effect on January 1, 2010 and they include additional emission reduction measures for diesel trucks and off-road equipment. The AB 32 Scoping Plan also outlines various emission reduction strategies needed to achieve the 2020 GHG emissions cap. The project construction contractors would implement these applicable control strategies. Therefore, construction of Alternative 1 would not conflict with the goals of the city or the state to reduce emissions of GHG. With implementation of control strategies, impacts to climate change would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause any significant changes in the construction GHG emissions from those described for Alternative 1. The project construction contractors would implement applicable control strategies discussed above and the impacts would *not be significant* as related to Factor 2.

4.2.2.2 Operational Impacts

4.2.2.2.1 Criteria and Toxic Air Pollutants

Factor 1: Operation of Alternative 1 would exceed BAAQMD emission significance thresholds.

Proposed operations would generate criteria pollutant emissions from onsite area sources (such as combustion of natural gas for space and water heating and other fuels for building and grounds maintenance equipment) and vehicles that access the project site. Area source emissions were based upon the land use designations and magnitudes identified in Section 2.5 of this SEIS. The Transportation Study estimates that the operation of Alternative 1 would generate 27,400 ADT of vehicles.

Table 4.2.2-3 summarizes the daily emissions produced from the operation of Alternative 1. These data show that on-road vehicles would be the main contributors to all pollutant levels, except for area sources, which would produce the majority of ROG emissions. In comparison to the 2007 NAA baseline, proposed operations would exceed the BAAQMD daily emissions thresholds for ROG, NO_x, PM_{10}, and $PM_{2.5}$.

Table 4.2.2-3. Daily Operational Emissions for Alternatives 1 and 1A - Year 2030 (Pounds per Day)

Scenario/Emission Source	*ROG*	*CO*	*NO_x*	*PM_{10}*	*$PM_{2.5}$*
Alternatives 1 and 1A					
Area Sources	168	30	53	1	1
Motor Vehicles	83	880	99	411	77
Total Alternatives 1 and 1A	**251**	**911**	**152**	**412**	**79**
Exceeds BAAQMD Threshold?	**Yes**	**N/A**	**Yes**	**Yes**	**Yes**
2007 No Action Alternative (NAA)					
Area Sources	0	0	0	0	0
Motor Vehicles	0	0	0	0	0
Total 2007 NAA	**0**	**0**	**0**	**0**	**0**
Alternative 1 - 2007 NAA =	**251**	**911**	**152**	**412**	**79**
Exceeds BAAQMD Threshold?	**Yes**	**N/A**	**Yes**	**Yes**	**Yes**
BAAQMD Significance Threshold	**54**	**N/A**	**54**	**82**	**54**

Source:
Appendix J, Air Emissions Calculations - Construction and Operation of the HPS Project Alternatives (Criteria and GHG Emission Calculations for Air Quality and GHG).

Environmental Controls

By design, Alternative 1 incorporates features that minimize motor vehicle trips and energy usages in buildings. As a result, there are no additional feasible environmental controls identified at this time that would further reduce operational emissions. Therefore, residual impacts to ROG, NO_x, PM_{10}, and $PM_{2.5}$ emission levels from the operation of Alternative 1 would *be significant* as related to Factor 1.

Minor changes to the project footprint, associated with the construction of Tower Variant D for Alternative 1 would not cause any substantial changes in the operational emissions from those described for Alternative 1, and the impacts from this option would *be significant* for ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions as related to Factor 1.

Factor 2: Operation of Alternative 1 would not expose nearby receptors to substantial pollutant concentrations.

Based on land uses types proposed by Alternative 1, substantial TAC emissions would likely only occur within areas designated for R&D uses. As discussed above in Section 4.2.1.2.2, the following presents an estimate of the impact of TACs emissions associated with Alternative 1 by inferring from the HHRA performed for Alternative 2 in the *DEIR, Volume V, Appendix H3 (SFRA 2009)* and *FEIR, Volume X, Appendix H3* (SFRA 2010). Alternative 2 would generate the highest amount of TACs from any project alternative. Therefore, health risks due to the operation of Alternative 1 would be less than those identified for Alternative 2.

The results of the HHRA would apply equally in comparison to the 2007 NAA baseline, as emissions from this scenario would be negligible. Therefore, netting out these baseline emissions from Alternative 1 emissions in the HHRA would result in nearly identical residual impacts.

Alternative 1 proposes half the R&D land use and resulting emissions of TACs compared to the Alternative 2 scenario evaluated in the HHRA (SFRA 2010). The results of this HHRA determined that operational emissions of TACs from Alternative 2 would not exceed the BAAQMD significance thresholds of 10 per million for cancer risk or 1.0 HI for non-cancer effects for any receptor type (See Figure 4-1a in *DEIR, Volume V, Appendix H3, Attachment III* [SFRA 2009]). Therefore, impacts from operation of Alternative 1 would *not be significant* as related to Factor 2.

Due to the large number of potential R&D facilities with sources of TAC emissions and their proximity to adjacent receptors, unmitigated impacts from these land uses could potentially exceed either the cancer risk or HI significance thresholds. Therefore, with implementation of the following emission reduction environmental controls, impacts to public health from operation of Alternative 1 would *not be significant* as related to Factor 2.

Environmental Controls

To minimize health risks from proposed sources of TACs from R&D uses, the applicant would implement the following environmental controls.

Minimum Area Limit for R&D Facilities that Emit TACs

In accordance with the approach used to evaluate proposed health impacts, the minimum plot size for a facility with sources of TAC emissions in R&D areas was set at 1 ac. If a facility with sources of TACs wishes to locate on a plot size smaller than 1 ac, the operator would provide an analysis to show that the facility emissions, in combination with all other sources of TACs in the R&D areas, would not exceed the health significance thresholds at the nearest residential locations.

R&D Facilities Comply with Health Significance Thresholds

Each facility with sources of TAC emissions would be required to limit their emissions such that the residential cancer risk and chronic non-cancer HI evaluated at the facility boundary would not exceed 10 in one million or 1.0, respectively. If these thresholds are exceeded at the boundary, the operator would provide an analysis to show that the facility emissions, in combination with all other sources of TACs in the R&D areas, would not exceed the health significance thresholds at the nearest sensitive receptor.

With implementation of the above environmental controls, impacts to public health from operation of Alternative 1 would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause any substantial changes in operational emissions from those described for Alternative 1 as the environmental controls identified above would be applied to this option. Thus, similar to the Alternative 1, the health risks from this option would *not be significant* as related to Factor 2.

Factor 2: Vehicle emissions ($PM_{2.5}$) due to the Operation of Alternative 1 would not exceed DPH thresholds or produce significant health impacts to nearby receptors.

Operation of Alternative 1 would increase vehicle trips and associated emissions along local roadways. These vehicle emissions could expose residents who live in proximity to these roads to adverse health effects. As discussed above in Section 4.2.1.2.2, the following presents an estimate of the impact of emissions from Alternative 1 traffic to ambient $PM_{2.5}$ levels based on the CAL3QHCR dispersion modeling analysis performed for traffic generated in the EIR (SFRA 2010). This analysis is based on impacts from the combined traffic generated from the proposed HPS and Candlestick Point sites, or 78,109 ADT. Alternative 1 would generate substantially less traffic (27,400 ADT) and resulting $PM_{2.5}$ emissions.

The results of the analysis completed in the EIR determined that vehicular emissions from 78,109 ADT would not expose residential receptors along roadways in proximity to the project site to annual $PM_{2.5}$ concentrations in excess of DPH's 0.2 $\mu g/m^3$ threshold (Figure 4-5 in *DEIR Volume V, Appendix H3, Attachment IV* [SFRA 2009]).

Due to the significantly lower ADT associated with Alternative 1 (27,400 ADT), it can be concluded that ambient impact of $PM_{2.5}$ emissions generated by Alternative 1 traffic would not exceed the DPH's annual $PM_{2.5}$ significance threshold of 0.2 $\mu g/m^3$. As a result, public health impacts from traffic generated by Alternative 1 would *not be significant* as related to Factor 2.

The results of the analysis for Alternative 1 were also compared to the 2007 NAA baseline, which would generate negligible vehicular emissions from the project site during this time period. Therefore, netting out these baseline emissions would result in nearly identical residual impacts as those estimated for Alternative 1. As a result, residual impacts from traffic generated by Alternative 1 would *not be significant* to public health as related to Factor 2. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause any substantial changes in operational emissions from those described for Alternative 1, and the $PM_{2.5}$ ambient impacts would *not be significant* as related to Factor 2.

Factor 3: Operation of Alternative 1 would not contribute to an exceedance of an ambient air quality standard.

Emissions of CO from traffic generated by Alternative 1 would impact local ambient CO levels. The following presents an estimate of these CO impacts based on the CALINE4 dispersion modeling analysis performed for traffic generated for the proposed action.

The results of the CALINE4 dispersion modeling analysis were compared to the 2007 NAA baseline, which would generate negligible vehicular emissions from the project site during this time period. Therefore, netting out these baseline emissions would result in nearly identical residual impacts as those estimated for Alternative 1.

Table 4.2.2-4 summarizes the results of the CO impact analysis performed for traffic generated by the EIR, which was based on impacts from the combined traffic generated from the proposed HPS and Candlestick Point sites, or 78,109 ADT (SFRA 2010). These data show that CO emissions from traffic generated by this high level of traffic scenario would not contribute to an exceedance of a CO ambient air quality standard. Alternative 1 would generate substantially less traffic (27,400 ADT) and resulting CO emissions compared to the analyzed scenario. Therefore, in comparison to the 2007 NAA baseline, impacts to ambient air quality levels from Alternative 1 would *not be significant* as related to Factor 3. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause any substantial changes in traffic-related CO emissions from those described for Alternative 1. The CO ambient impacts would *not be significant* as related to Factor 3.

Table 4.2.2-4. Traffic CO Impacts Predicted for Intersections Adjacent to the Project Site – Alternatives 1 and 1A

Intersection	1-Hour CO Impacts (ppm)		8-Hour CO Impacts (ppm)	
	Traffic Only (2030)	Total Traffic Impact (2030)	Traffic Only (2030)	Total Traffic Impact (2030)
Arelious Walker Dr/Gilman Ave	0.6	3.1	1.7	3.3
Third St/Gilman Ave	0.7	3.2	1.9	3.5
Griffith St/Palou Ave	0.3	2.8	1.7	3.4
Evans Ave/Jennings St	0.5	3.0	2.0	3.6

Calculations reflect CO levels at 25 ft (7.6 m) from roadside.
Total traffic impact equates to background concentration plus project traffic only impacts.

2007 CO Background:
1-hour average: 2.5 ppm
8-hour average: 1.6 ppm

Ambient CO Standards:
1-hour—federal: 35 ppm; state: 20 ppm
8-hour—federal and state: 9 ppm

Source: SFRA 2010.

Factor 4: Operation of Alternative 1 would not conflict with or obstruct implementation of the regional air quality plans.

The current air quality plans for the SFBAAB are the *Bay Area 2005 Ozone Strategy* and the adopted *Bay Area 2010 Clean Air Plan (CAP)* (BAAQMD 2010). Both the 2005 Plan and the 2010 CAP emphasize the need for smart growth (land use and local impact measures) and reductions of single automobile occupancy (transportation control measures). Alternative 1 would promote many of these control measures.

The land use and local impacts measures proposed in the CAP would promote focused growth to reduce motor vehicle travel and to protect people from exposure to stationary and mobile sources of emissions. Alternative 1 proposes no significant stationary sources within 1,000 ft (305 m) of residential development, and it would implement environmental controls. Additionally, the results of the dispersion modeling analysis show that mobile source emissions from Alternative 1 would not result in significant impacts to the public. Finally, Alternative 1 proposes a design that is an example of focused and mixed growth that would reduce vehicular travel.

The CAP transportation control measures are grouped into five categories: 1) improve transit services; 2) improve system efficiency; 3) encourage sustainable travel behavior; 4) support focused growth; and 5) implement pricing strategies. Alternative 1 would support some of these categories, as it would: 1) improve transit services by adding and expanding certain transit routes; 2) improve system efficiency and encourage sustainable travel behavior by locating residences near jobs, shopping, and services; and 3) support focused growth by locating high-density residences near transit and services. Therefore, Alternative 1 would promote implementation of the regional air quality plans and its impacts would *not be significant* as related to Factor 4.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause any substantial changes in location of stationary sources and mobile source emissions from those described for Alternative 1. Thus, similar to Alternative 1, this option would promote implementation of the regional air quality plans and impacts and would *not be significant* as related to Factor 4.

Factor 5: Operation of Alternative 1 would not generate objectionable odors affecting a substantial number of people.

Odor impacts could result from siting a new odor source near existing sensitive receptors or siting a new sensitive receptor near an existing odor source. Examples of land uses that the BAAQMD considers would have the potential to generate considerable odors include wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, oil refineries, and chemical plants. Alternative 1 does not propose any of these land use types. The large mixed-use development proposed by Alternative 1 has the potential to generate small and localized sources of odor emissions, such as from food preparation or solid waste collection. In the event that there are public concerns about these new odors, it is expected that the operators of these sources would reduce their emissions to below nuisance levels, in accordance with BAAQMD requirements. As a result, odor impacts from operation of Alternative 1 would *not be significant* as related to Factor 5. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause any significant changes in location or type of stationary sources from those described for Alternative 1. Thus, odor impacts would *not be significant* as related to Factor 5.

4.2.2.2.2 GHGs

Factor 1: Emissions of GHGs from the operation of Alternative 1 would not produce significant impacts to the environment.

Table 4.2.2-5 summarizes the total annual GHG emissions that would occur from operation of Alternative 1 upon full build-out. These data show that proposed operations would emit a total of 52,754 mt of CO_2e emissions in 2030, assuming a zero baseline for 2007 NAA conditions. The reduction in GHG emissions resulting from the amount of CO_2 sequestered by new plantings as a result of GHG Environmental control 1 are accounted for under the vegetation source in Table 4.2.2-5.

Table 4.2.2-5. Alternatives 1 and 1A Operations - Annual CO_2e Emissions (mt per year)

Source	***Alternative 1***	***2007 No Action Alternative***
Vegetation	(88)	
Residential	6,642	
Non-Residential	13,766	0
Motor Vehicles	30,371	0
Municipal	766	
Area	56	
Waste	375	
Transit Area	865	
Total	**52,753**	**0**
Alternative 1 - 2007 NAA =		**52,753**
U.S. 2009 Annual GHG Emissions (10^6 mt)		6,633
Proposed Emissions as a % of U.S. GHG Emissions		0.0008
Sources: SFRA 2010; USEPA 2011.		

The development plan for Alternative 1 is conceptual, and many of the assumptions used to estimate GHG emissions from proposed operations would result in lower GHG emissions than those that would occur from operations under current standards. Therefore, to ensure that the final development would comply with these assumptions and would result in efficient operations that minimize the generation of GHG emissions, GHG environmental controls 1 through 4 are proposed below.

In the absence of an adopted or science-based NEPA significance threshold for GHGs, this SEIS compares GHG emissions that would occur from the operation of Alternative 1 to the U.S. GHG baseline inventory of 2009 (USEPA 2011) to determine the relative increase in proposed GHG emissions. The data in Table 4.2.2-5 show that the ratio of annual average CO_2e emissions from the operation of Alternative 1 to the CO_2e emissions associated with net sources in the U.S. in 2009 is approximately 0.053/6,633 million mt, or about 0.0008 percent of the U.S. CO_2e emissions inventory. Since GHG emissions from Alternative 1 would equate to such a minimal amount of the U.S. GHG emissions inventory, they would not substantially contribute to global climate change.

GHG Environmental Controls

1. Plant up to 5,000 net new trees at the project site and in the community.
2. Exceed the 2008 Standards for Title 24 Part 6 energy efficiency standards for homes and businesses by at least 15 percent.
3. Install ENERGY STAR appliances, where appliances are offered by homebuilders.
4. Use light emitting diode (LED) based energy efficient street lighting.

Implementation of these GHG environmental controls would ensure that GHG emissions impacts to the environment from operation of Alternative 1 would *not be significant* as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause any substantial changes in operational GHG emissions from those described for Alternative 1, and climate change impacts would *not be significant* as related to Factor 1.

Factor 2: Operation of Alternative 1 would not conflict with adopted plans or policies to reduce emissions of GHGs.

As discussed in Section 4.2.1.2.3, analysis of the operation of Alternative 1 takes into consideration proposed design features that would minimize the generation of GHG emissions. These include mixed land uses and building designs that would provide neighborhood-serving retail; automobile, public transportation, and pedestrian connections between the project site and surrounding community; and land uses that facilitate walking and cycling. Conceptual design features, such as landscape plans and energy efficiencies in building design also would result in lower GHG emissions. Further, proposed transportation features that minimize GHGs would be implemented in part by SFMTA as control measures (Section 4.1).

The AB 32 Scoping Plan also outlines various emission reduction strategies needed to achieve the 2020 GHG emissions cap. One area of focus is building energy efficiency through improvements in building codes and implementation of green building ordinances. As analyzed, Alternative 1 would implement the 2008 Title 24 building codes and would exceed these standards by 15 percent on all buildings (Environmental Control 2). Thus, Alternative 1 would promote these goals of AB 32.

Several measures in the Scoping Plan aim at reducing transportation related emissions, including Senate Bill (SB) 375, which encourages regional transportation planning, vehicle fuel efficiency measures, transit oriented development, mixed-use of land, and urban infill development projects. Alternative 1 would be consistent with many of these strategies.

Furthermore, the Scoping Plan proposes reductions in the carbon intensity of the electricity supply through implementation of renewable portfolio standards. The proposed use of efficient-build designs and street lighting under Alternative 1 would promote these goals of the Scoping Plan.

The City and County of San Francisco have additional regulations and ordinances, including the SFCAP whose implementation would limit GHG emissions from the operation of Alternative 1. These include the green building ordinance, greenhouse gas reduction ordinance, "transit first" policy, and bicycle plan.

The design of Alternative 1, in concept, includes many of the GHG reduction measures proposed in the AB 32 Scoping Plan, local ordinances, and the SFCAP. Therefore, operation of Alternative 1 would not conflict with local or state goals to reduce emissions of GHG and impacts to climate change would not be significant as related to Factor 2.

GHG Environmental Controls

Implementation of GHG environmental controls 1 through 4 would ensure that impacts to climate change from operation of Alternative 1 would *not be significant* as related to Factor 2.

Tower Variant D for Alternative 1, in concept, would include many of the GHG reduction measures proposed in the AB 32 Scoping Plan, local ordinances, and the Climate Action Plan. Therefore, operation of Tower Variant D for Alternative 1 would not conflict with local or state goals to reduce emissions of GHG. Climate change impacts would *not be significant* as related to Factor 2.

4.2.3 Alternative 1A: Stadium Plan/No-Bridge Alternative

4.2.3.1 Construction Impacts

4.2.3.1.1 Criteria and Toxic Air Pollutants

Factor 1: Construction of Alternative 1A would result in emissions that exceed BAAQMD significance criteria.

Excluding development of the Yosemite Slough bridge, construction of Alternative 1A would result in lower amounts of fugitive dust and combustive emissions compared to Alternative 1 (Table 4.2.2-1). Similar to Alternative 1, construction of Alternative 1A would result in emissions that would exceed the daily NO_x emissions significance threshold of 54 ppd.

Environmental Controls

To minimize fugitive dust emissions during construction, the construction contractor would implement feasible dust controls required by San Francisco Health Code (Article 22B) and the BAAQMD. The construction contractor would document all proposed environmental controls in a project DCP, as previously discussed under Alternative 1, and would submit the DCP to the BAAQMD and the DPH for approval prior to initiation of ground disturbing activities at the project site. Compliance with these control requirements would reduce fugitive dust emissions from construction by at least 90 percent. However, combustive emissions would still exceed the NO_x daily significance threshold.

Since construction of Alternative 1A would exceed the daily emission significance threshold for NO_x, the lead agency would consider all feasible environmental controls to reduce these emissions so impacts would not be significant. One of the most feasible controls for this purpose would be to use a construction equipment fleet that has a high percentage of new equipment, as they have the most current and stringent emission standards. In addition, use of engine exhaust after-treatment devices is also a feasible control to minimize NO_x emissions from construction equipment. Similar to Alternative 1, 50 percent of the proposed construction equipment fleet would meet USEPA Tier 2 standards and would be outfitted with particulate matter controls. However, given the magnitude of proposed construction activities, it would be difficult to reduce proposed construction emissions to below the daily NO_x significance threshold. Therefore, NO_x emissions from construction activities under Alternative 1A would *be significant*, whereas ROG, PM_{10}, and $PM_{2.5}$ emissions from construction would *not be significant* as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in the construction criteria pollutant emissions from those described for Alternative 1A, and the impacts *would be significant* for NO_x emissions but *not significant* for ROG, PM_{10}, and $PM_{2.5}$ emissions as related to Factor 1.

Factor 2: Construction of Alternative 1A would not expose sensitive receptors to substantial pollutant concentrations.

The impacts of DPM and chemicals bound to airborne dust emissions from construction of Alternative 1A would be similar to slightly lower than those estimated for Alternative 1, due to lower amounts of combustive emissions that would be generated during Alternative 1A construction. Similar to Alternative 1, emissions of DPM and chemicals bound to airborne dust due to the construction of Alternative 1A would not result in an exceedance of the health significance thresholds of 10 in a million for cancer risk or HI of 1.0 for non-cancer health effects for any receptor type.

Environmental Controls

To reduce DPM emissions during proposed construction, the construction contractor would implement environmental controls as described in Section 4.2.2.1.1. Implementation of this control and an approved DCP and ADMP would help ensure that public health impacts from construction of Alternative 1A would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in construction toxic air contaminant emissions from those described for Alternative 1A, as similar environmental controls would be applied. The health risks would be similar to those from Alternative 1 and would *not be significant* as related to Factor 2.

4.2.3.1.2 GHGs

Factor 1: Emissions of GHGs from the construction of Alternative 1A would not produce significant impacts to the environment.

Emissions of GHGs from the construction of Alternative 1A would be similar to and slightly lower compared to Alternative 1, as shown in Table 4.2.2-2, since this alternative would not construct the Yosemite Slough bridge. Similar to Alternative 1, since GHG emissions from construction of Alternative 1A would equate to a minimal amount of the U.S. GHG emissions inventory, they would not substantially contribute to global climate change. Therefore, GHG emissions impacts to the environment from construction of Alternative 1A would *not be significant* as related to Factor 1. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in construction GHG emissions from those described for Alternative 1A, and the impacts would *not be significant* as related to Factor 1.

Factor 2: Construction of Alternative 1A would not conflict with adopted state plans to reduce emissions of GHGs.

Similar to Alternative 1, the proposed construction contractors would implement all applicable GHG emission controls identified in the AB 32 Scoping Plan or the SFCAP. Therefore, construction of Alternative 1A would not conflict with the goals of the city or the state to reduce emissions of GHG. This would result in impacts to climate change that would *not be significa*nt as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in the construction GHG emissions from those described for Alternative 1A. The project construction contractors would implement applicable control strategies discussed above, and the impacts would *not be significant* as related to Factor 2.

4.2.3.2 Operational Impacts

4.2.3.2.1 Criteria and Toxic Air Pollutants

Factor 1: Operation of Alternative 1A would exceed BAAQMD emission significance thresholds.

Similar to Alternative 1, proposed operations of Alternative 1A would generate criteria pollutant emissions from onsite area sources (such as combustion of natural gas for space and water heating and other fuels for building and grounds maintenance equipment) and vehicles that access the project site. The Transportation Study (Section 4.1) estimates that the operation of Alternative 1A at full build-out would generate 27,400 ADT from vehicles, which is the same as Alternative 1.

The operational emissions from Alternative 1A would be similar to Alternative 1, as shown in Table 4.2.2-3. These data show that on-road vehicles are the main contributors to all pollutant levels, except for area sources, which would produce the majority of ROG emissions. In comparison to the 2007 NAA baseline, operation of Alternative 1A would exceed the daily emissions significance thresholds for ROG, NO_x, PM_{10}, and $PM_{2.5}$.

Environmental Controls

By design, Alternative 1A incorporates features that would minimize motor vehicle trips and energy usages in buildings. As a result, there are no additional feasible environmental controls identified at this time that would further reduce operational emissions. Therefore, residual impacts to ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions from the operation of Alternative 1A would *be significant* as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in the operational emissions from those described for Alternative 1A, and the impacts from this option would *be significant* for ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions as related to Factor 1.

Factor 2: Operation of Alternative 1A would not expose nearby receptors to substantial pollutant concentrations.

As described above for Alternative 1, an HHRA was performed to evaluate the ambient impacts of proposed TAC emissions that would occur within areas designated for R&D uses based on a worst-case scenario analysis, which corresponds to Alternative 2. The Alternative 2 emission estimates were used to evaluate their excess lifetime cancer risk and chronic non-cancer health effects at surrounding receptor locations. The results of this worst-case scenario HHRA determined that operational emissions of TACs from Alternative 2 would not result in exceedance of the significance thresholds of 10 per million for cancer risk or HI of 1.0 for non-cancer health effects for any receptor type (SFRA 2010).

As discussed above in Section 4.2.1.2.2, the following presents an estimate of the impact of emissions from Alternative 1A based on the worst-case scenario HHRA performed for Alternative 2. Alternative 1A proposes half the R&D land use and resulting emissions of TACs compared to Alternative 2 scenario evaluated in the HHRA.

The results of the HHRA analysis would apply equally in comparison to the 2007 NAA baseline, since emissions from this scenario are negligible. Therefore, netting out these baseline emissions from Alternative 1A emissions in the HHRA would result in nearly identical residual impacts.

Due to the large number of potential R&D facilities with sources of TAC emissions and their proximity to adjacent receptors, unmitigated impacts from these land uses could potentially exceed either the cancer risk or HI significance thresholds. Therefore, implementation of the following environmental controls would ensure that impacts to public health from operation of Alternative 1A would *not be significant* as related to Factor 2.

Environmental Controls

To minimize health risks from proposed sources of TACs from R&D uses, the applicant would implement environmental controls, as detailed in Section 4.2.2.2.1. Implementation of these controls would ensure that impacts to public health from operation of Alternative 1A would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in operational emissions from those described for Alternative 1A, and the health risks from this option would *not be significant* as related to Factor 2.

Factor 2: Vehicle emissions ($PM_{2.5}$) due to the Operation of Alternative 1A would not exceed DPH thresholds or produce significant health impacts to nearby receptors.

Similar to Alternative 1, operation of Alternative 1A would increase vehicle trips and associated emissions along local roadways. These vehicle emissions could expose residents who live in proximity to these roads to adverse health effects. The following presents an estimate of the impact of emissions from Alternative 1A traffic to ambient $PM_{2.5}$ levels based on the CAL3QHCR dispersion modeling analysis performed for traffic generated in the EIR (SFRA 2010).

Alternative 1A would generate substantially less traffic (27,400 ADT) and resulting $PM_{2.5}$ emissions compared to the scenario (78,109 ADT) evaluated in the EIR dispersion modeling analysis. The results of the analysis completed in the EIR determined that vehicular emissions from 78,109 ADT would not expose residential receptors along roadways in proximity to the project site to annual $PM_{2.5}$ concentrations in excess of the DPH's 0.2 $\mu g/m^3$ threshold (SFRA 2010).

Because of the significantly lower ADT associated with Alternative 1A (27,400 ADT), it can be concluded that ambient impact of $PM_{2.5}$ emissions generated by Alternative 1A traffic would not exceed the DPH annual $PM_{2.5}$ threshold of 0.2 $\mu g/m^3$. As a result, health impacts from traffic generated by Alternative 1A would *not be significant* as related to Factor 2.

Results of the analysis for Alternative 1A were also compared to the 2007 NAA baseline, which would generate negligible vehicular emissions from the project site during this time period. Therefore, netting out these baseline emissions would result in nearly identical to slightly lower residual impacts as those estimated for Alternative 1A. As a result, residual health impacts from traffic generated by Alternative 1A would *not be significant* as related to Factor 2. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in operational emissions from those described for Alternative 1A, and the $PM_{2.5}$ ambient impacts would *not be significant* as related to Factor 2.

Factor 3: Operation of Alternative 1A would not contribute to an exceedance of an ambient air quality standard.

Emissions from traffic generated by Alternative 1A would contribute to localized CO impacts. The following presents an estimate of these CO impacts based on the EIR CALINE4 dispersion modeling analysis performed for the combined traffic generated from the proposed HPS and Candlestick Point sites, or 78,109 ADT (SFRA 2010), as summarized in Table 4.2.2-4. These data show that CO emissions from traffic generated by this high level of traffic scenario would not contribute to an exceedance of a CO ambient air quality standard. Alternative 1A would generate substantially less traffic (27,400 ADT) and resulting CO emissions compared to the analyzed scenario. Therefore, in comparison to the 2007 NAA baseline, impacts to ambient air quality levels for Alternative 1A would *not be significant* as related to Factor 3. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in traffic-related CO emissions from those described for Alternative 1A, and CO ambient impacts from these options would *not be significant* as related to Factor 3.

Factor 4: Operation of Alternative 1A would not conflict with or obstruct implementation of the regional air quality plans.

Similar to Alternative 1, Alternative 1A would be consistent with emission controls proposed in the *Bay Area 2005 Ozone Strategy* and the adopted *Bay Area 2010 CAP* (BAAQMD 2010). Alternative 1A would promote implementation of the regional air quality plans, and impacts would *not be significan*t as related to Factor 4.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in location of stationary sources and mobile source emissions from those described for Alternative 1A. Thus, similar to Alternative 1A, this option would promote implementation of the regional air quality plans, and impacts would *not be significant* as related to Factor 4.

Factor 5: Operation of Alternative 1A would not generate objectionable odors affecting a substantial number of people.

Alternative 1A does not propose any land uses that the BAAQMD considers as having the potential to generate significant odors. The large mixed-use development proposed by Alternative 1A has the potential to generate small and localized sources of odor emissions, such as from food preparation or solid waste collection. In the event that there are public concerns about these new odors, it is expected that the operators of these sources would reduce their emissions to below nuisance levels. Therefore, odor impacts from operation of Alternative 1A would *not be significant* as related to Factor 5. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in location or type of stationary sources from those described for Alternative 1A, and odor impacts would *not be significant* as related to Factor 5.

4.2.3.2.2 GHGs

Factor 1: Emissions of GHGs from the operation of Alternative 1A would not produce significant impacts to the environment.

Emissions of GHGs from Alternative 1A operations would be similar to those estimated for Alternative 1. Table 4.2.2-5 summarizes the total annual GHG emissions that would occur from the operation of Alternative 1A upon full build-out. These data show that proposed operations would emit a total of 52,754 mt of CO_2e emissions in 2030, assuming a zero baseline for the 2007 NAA condition. As discussed for Alternative 1, since GHG emissions from Alternative 1A would equate to a minimal amount of the U.S. GHG emissions inventory, they would not substantially contribute to global climate change.

GHG Environmental Controls

The development plan for Alternative 1A is conceptual and many of the assumptions used to estimate GHG emissions from proposed operations would result in lower GHG emissions than those that would occur from operations under current standards. To ensure that the final development would comply with these assumptions and result in efficient operations that minimize the generation of GHG emissions, GHG environmental controls 1 through 4 previously discussed under Alternative 1 are proposed for Alternative 1A. Implementation of these environmental controls would ensure that GHG emissions impacts to the environment from operation of Alternative 1A would *not be significant* as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause any substantial changes in operational GHG emissions from those described for Alternative 1A, and climate change impacts would *not be significant* as related to Factor 1.

Factor 2: Operation of Alternative 1A would not conflict with adopted plans or policies to reduce emissions of GHGs.

Similar to Alternative 1, the design of Alternative 1A, in concept, includes many of the GHG environmental controls proposed in the AB 32 Scoping Plan, local ordinances, and the SFCAP. Therefore, operation of Alternative 1A would not conflict with local or state goals to reduce emissions of GHG, and impacts would not be significant as related to Factor 2.

GHG Environmental Controls

With implementation of GHG environmental controls 1 through 4 detailed under Alternative 1, impacts from operation of Alternative 1A would *not be significant* as related to Factor 2.

The Tower Variant D for Alternative 1A, in concept, would include many of the GHG reduction measures proposed in the AB 32 Scoping Plan, local ordinances, and the SFCAP. Therefore, operation of the Tower Variant for Alternative 1A would not conflict with local or state goals to reduce emissions of GHG, and climate change impacts would *not be significant* as related to Factor 2.

4.2.4 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

4.2.4.1 Construction Impacts

4.2.4.1.1 Criteria and Toxic Air Pollutants

Factor 1: Construction of Alternative 2 would result in emissions that exceed BAAQMD significance criteria.

Levels of fugitive dust and combustive emissions generated by the construction of Alternative 2, which replaces stadium construction with higher amounts of R&D land use development, would be slightly higher than those generated by Alternative 1. The data in Table 4.2.4-1 show that similar to Alternative 1, construction of Alternative 2 would produce emissions that would exceed the daily NO_x emissions significance threshold of 54 ppd.

Table 4.2.4-1. Average Daily Combustive Emissions Produced from Construction of Alternatives 2 and 2A

Activity	*Daily Emissions (Pounds per Day)*			
	ROG	*NO_x*	*PM_{10}*	*$PM_{2.5}$*
Average Construction Day	41	206	10	8
BAAQMD Significance Threshold	**54**	**54**	**82**	**54**
Exceeds BAAQMD Threshold?	**No**	**Yes**	**No**	**No**

Environmental Controls

To minimize fugitive dust emissions during construction, the construction contractor would implement feasible dust controls specified by San Francisco Health Code (Article 22B) and the BAAQMD. The construction contractor would document all proposed environmental controls in a project DCP, as previously discussed under Alternative 1, and would submit the DCP to the BAAQMD and the DCP for approval prior to initiation of ground disturbing activities at the project site. Compliance with these control requirements would reduce fugitive dust emissions from construction by at least 90 percent. However, combustive emissions would still exceed the NO_x daily significance threshold.

To reduce NO_x emissions from the construction of Alternative 2, the lead agency would consider all feasible environmental controls so that emissions would not be significant. One of the most feasible controls for this purpose would be to use a construction equipment fleet that has a high percentage of new equipment, as such fleets have the most current and stringent emission standards. In addition, use of engine exhaust after-treatment devices is also a feasible environmental control to minimize NO_x emissions from construction equipment. However, given the magnitude of proposed construction activities, it would be difficult to reduce proposed construction emissions to below the daily NO_x significance threshold. Therefore, NO_x emissions from construction activities under Alternative 2 would *be significant,* whereas ROG, PM_{10}, and $PM_{2.5}$ emissions from construction would *not be significant* as related to Factor 1.

The option that calls for the preservation of Buildings 208, 211, 224, 231, and 253 would reduce demolition activities and resultant overall combustive emissions and fugitive dust. Minor changes to the project footprint, associated with construction of the Tower Variant D, or reduction in construction activities related to the Building Preservation option for Alternative 2, would not cause any substantial changes in the construction criteria pollutant emissions from those described for Alternative 2, and the impacts would *be significant* for NO_x emissions but *not significant* for ROG, PM_{10}, and $PM_{2.5}$ emissions as related to Factor 1.

Factor 2: Construction of Alternative 2 would not expose sensitive receptors to substantial pollutant concentrations.

The impacts of DPM and chemicals bound to airborne dust emissions from construction of Alternative 2 would be similar to slightly higher than those estimated for Alternative 1, due to higher incremental amounts of combustive emissions that would be generated by during Alternative 2 construction. Similar to Alternative 1, emissions of DPM and chemicals bound to airborne dust due to the construction of Alternative 2 would not exceed the significance thresholds for cancer risk of 10 in a million or HI of 1.0 for non-cancer health effects for any receptor type. As a result, construction of Alternative 2 would not result in significant health impacts as related to Factor 2 with the implementation of environmental controls mentioned in section 4.2.2.1.1 and an approved DCP and ADMP.

Environmental Controls

To reduce DPM emissions during proposed construction, the construction contractor would implement environmental controls as described in section 4.2.2.1.1. Implementation of this control and an approved DCP and ADMP would help ensure that public health effect impacts from construction of Alternative 2 would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 2, would not cause any substantial changes in construction toxic air contaminant emissions from those described for Alternative 2, as similar environmental controls would be applied. The health risks for these options would be similar to those from Alternative 2 and would *not be significant* as related to Factor 2.

4.2.4.1.2 GHGs

Factor 1: Emissions of GHGs from the construction of Alternative 2 would not produce significant impacts to the environment.

Emissions of GHGs from the construction of Alternative 2 would be similar to and slightly higher compared to Alternative 1, due to the slightly higher amount of development associated with this alternative. As is the case with Alternative 1, GHG emissions from the construction of Alternative 2 would equate to a minimal amount of the U.S GHG emissions inventory; for that reason, they would not substantially contribute to global climate change. Therefore, emissions of GHGs from construction of Alternative 2 would result in *no significant* impacts to the environment as related to Factor 1. Because impacts would not be significant, no mitigation is proposed.

Preservation of Buildings 208, 211, 224, 231, and 253 would reduce proposed construction activity and associated emissions of GHGs. Minor changes to the project footprint, associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 2 would not cause any substantial changes in construction GHG emissions from those described for Alternative 2, and the impacts would *not be significant* as related to Factor 1.

Factor 2: Construction of Alternative 2 would not conflict with adopted state plans to reduce emissions of GHGs.

Similar to Alternative 1, the proposed construction contractors would implement all applicable GHG emission controls identified in the AB 32 Scoping Plan or the SFCAP. Therefore, construction of Alternative 2 would not conflict with the goals of the city or the state to reduce emissions of GHG. With implementation of control strategies, impacts to climate change would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 2, would not cause any substantial changes in the construction GHG emissions from those described for Alternative 2. The project construction contractors would implement applicable control strategies discussed above, and GHG impacts from these options would *not be significant* as related to Factor 2.

4.2.4.2 Operational Impacts

4.2.4.2.1 Criteria and Toxic Air Pollutants

Factor 1: Operation of Alternative 2 would exceed BAAQMD emission significance thresholds.

Proposed Alternative 2 operations would generate criteria pollutant emissions from onsite area sources (such as combustion of natural gas for space and water heating and other fuels for building and grounds maintenance equipment) and vehicles that access the project site. The Transportation Study (Section 4.1) estimates that the operation of Alternative 2 at full build-out would generate 35,021 ADT from vehicles.

Table 4.2.4-2 summarizes the daily emissions that would be produced from the operation of Alternative 2. These data show that on-road vehicles would be the main contributors to all pollutant levels, with the exception of "Area Sources," which would produce the majority of ROG emissions. In comparison to the 2007 NAA baseline, proposed operations would exceed the daily emissions significance thresholds for ROG, NO_x, PM_{10}, and $PM_{2.5}$.

Table 4.2.4-2. Daily Operational Emissions for Alternative 2 - Year 2030 (Pounds per Day)

Scenario/Emission Source	*ROG*	*CO*	*NO_x*	*PM_{10}*	*$PM_{2.5}$*
Alternative 2					
Area Sources	184	44	70	1	1
Motor Vehicles	106	1,121	126	521	99
Total Alternative 2	**290**	**1,166**	**196**	**523**	**100**
Exceeds BAAQMD Threshold?	**Yes**	**N/A**	**Yes**	**Yes**	**Yes**
2007 No Action Alternative (NAA)					
Area Sources	0	0	0	0	0
Motor Vehicles	0	0	0	0	0
Total 2007 NAA	**0**	**0**	**0**	**0**	**0**
Alternative 2 - 2007 NAA =	***290***	***1,166***	***196***	***523***	***100***
Exceeds BAAQMD Threshold?	**Yes**	**N/A**	**Yes**	**Yes**	**Yes**
BAAQMD Significance Threshold	***54***	***N/A***	***54***	***82***	***54***

Source:
Appendix J, Air Emissions Calculations - Construction and Operation of the HPS Project Alternatives (Criteria and GHG Emission Calculations for Air Quality and GHG).

Environmental Controls

By design, Alternative 2 incorporates features that would minimize motor vehicle trips and energy usages in buildings. As a result, there are no additional feasible environmental controls identified at this time that would further reduce operational emissions. Therefore, residual impacts to ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions from the operation of Alternative 2 would *be significant* as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2 would not cause any substantial changes in the operational emissions from those described for Alternative 2. The impacts from these options would *be significant* for ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions as related to Factor 1.

Factor 2: Operation of Alternative 2 would not expose nearby receptors to substantial pollutant concentrations.

An HHRA was performed to evaluate the ambient impact of proposed TAC emissions that would occur within areas designated for R&D uses by Alternative 2 (SFRA 2010). These emission estimates were used to evaluate their excess lifetime cancer risk and chronic non-cancer effects at surrounding receptor locations. The results of the HHRA completed in the EIR would apply equally in comparison to the 2007 NAA baseline, as those emissions are negligible. Therefore, netting out these baseline emissions from Alternative 2 emissions in the HHRA would result in nearly identical residual health risk impacts.

The results of the HHRA determined that the impact of operational emissions of TACs from Alternative 2 would not exceed the significance thresholds for cancer risk of 10 in a million or HI of 1.0 for non-cancer effects for any receptor type (SFRA 2010).

An analysis was not conducted to determine unmitigated impacts. However, due to the large number of potential R&D facilities with sources of TAC emissions and their proximity to adjacent receptors, unmitigated impacts could potentially exceed either the cancer risk or HI significance thresholds. Therefore, implementation of the following emission reduction controls would ensure that impacts to public health from operation of Alternative 2 would not be significant health as related to Factor 2.

Environmental Controls

To minimize health risks from proposed sources of TACs from R&D uses, the applicant would implement environmental controls, as detailed in Section 4.2.2.2.1. Implementation of these controls would ensure that impacts to public health from the operation of Alternative 2 would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2 would not cause any substantial changes in operational emissions from those described for Alternative 2, and the health risks from these options would *not be significant* as related to Factor 2.

Factor 2: Vehicle emissions ($PM_{2.5}$) due to the Operation of Alternative 2 would not exceed DPH thresholds or produce significant health impacts to nearby receptors.

Operation of Alternative 2 would increase vehicle trips and associated emissions along local roadways. These vehicle emissions could expose residents who live in proximity to these roads to adverse health effects. The following presents an estimate of the impact of emissions from Alternative 2 traffic to ambient $PM_{2.5}$ levels based on the CAL3QHCR dispersion modeling analysis performed for traffic generated in the EIR (SFRA 2010).

Alternative 2 would generate substantially less traffic (35,012 ADT) and resulting $PM_{2.5}$ emissions compared to the scenario evaluated in the EIR dispersion modeling analysis (78,109 ADT). The results of the analysis completed in the EIR determined that vehicular emissions from 78,109 ADT would not expose residential receptors along roadways in proximity to the project site to annual $PM_{2.5}$ concentrations in excess of DPH's 0.2 $\mu g/m^3$ threshold (SFRA 2010).

Because of the significantly lower level of traffic associated with Alternative 2 (35,012 ADT), it can be concluded that ambient impact of $PM_{2.5}$ emissions generated by Alternative 2 traffic would not exceed the DPH annual $PM_{2.5}$ threshold of 0.2 $\mu g/m^3$. As a result, health impacts from traffic generated by Alternative 2 would *not be significant* as related to Factor 2.

The results of the analysis for Alternative 2 were also compared to the 2007 NAA baseline, which would generate negligible vehicular emissions from the project site during this time period. Therefore, netting out these baseline emissions would result in nearly identical to slightly lower residual impacts as those estimated for Alternative 2. As a result, residual public health impacts from traffic generated by Alternative 2 would *not be significant* as related to Factor 2. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2 would not cause any substantial changes in operational emissions from those described for Alternative 2, and the $PM_{2.5}$ ambient impacts would *not be significant* as related to Factor 2.

Factor 3: Operation of Alternative 2 would not contribute to an exceedance of an ambient air quality standard.

Emissions from traffic generated by Alternative 2 would contribute to localized CO impacts. The following presents an estimate of these impacts based on the EIR CALINE4 dispersion modeling analysis performed for the combined traffic generated from the proposed HPS and Candlestick Point sites, or 78,109 ADT (SFRA 2010), as summarized in Table 4.2.2-4. These data show that CO emissions generated by this high level of traffic would not contribute to an exceedance of a CO ambient air quality standard. Alternative 2 would generate substantially less traffic (35,012 ADT), resulting in substantially lower CO emissions compared to the analyzed scenario. Therefore, in comparison to the 2007 NAA baseline, impacts to ambient air quality levels for Alternative 2 would *not be significant* as related to Factor 3. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2 would not cause any substantial changes in traffic-related CO emissions from those described for Alternative 2, and CO ambient impacts from these options would *not be significant* as related to Factor 3.

Factor 4: Operation of Alternative 2 would not conflict with or obstruct implementation of the regional air quality plans.

Similar to Alternative 1, Alternative 2 would be consistent with emission controls proposed in the *Bay Area 2005 Ozone Strategy* and the adopted *Bay Area 2010* CAP (BAAQMD 2010). Alternative 2 would promote implementation of the regional air quality plans, and impacts would *not be significant* as related to Factor 4.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2 would not cause any substantial changes in location of stationary sources and mobile source emissions from those described for Alternative 2. Thus, similar to Alternative 2, these options would promote implementation of the regional air quality plans and their impacts would be *not significant* as related to Factor 4.

Factor 5: Operation of Alternative 2 would not generate objectionable odors affecting a substantial number of people.

Alternative 2 does not propose any land uses that the BAAQMD considers to have the potential for generating considerable odors. The large mixed-use development proposed by Alternative 2 has the potential to generate small and localized sources of odor emissions, such as from food preparation or solid waste collection. In the event that there are public concerns about these new odors, it is expected that the operators of these sources would reduce their emissions to below nuisance levels. Therefore, odor impacts from operation of Alternative 2 would *not be significant* as related to Factor 5. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2 would not cause any substantial changes in location or type of stationary sources from those described for Alternative 2, and odor impacts from these options would *not be significant* as related to Factor 5.

4.2.4.2.2 GHGs

Factor 1: Emissions of GHGs from the operation of Alternative 2 would not produce significant impacts to the environment.

Table 4.2.4-3 summarizes the total annual GHG emissions that would occur from the operation of Alternative 2 upon full build-out. These data show that proposed operations would emit a total of 74,288 mt of CO_2e emissions in 2030, assuming a zero baseline for 2007 NAA conditions. The reduction in GHG emissions resulting from the amount of CO_2 sequestered by new plantings as a result of GHG environmental control are accounted for under the vegetation source in Table 4.2.4-3.

As discussed for Alternative 1, since GHG emissions from Alternative 2 would equate to a minimal amount of the U.S. GHG emissions inventory, they would not substantially contribute to global climate change.

Table 4.2.4-3. Alternative 2 Operations - Annual CO_2e Emissions (mt per Year)

Source	*Alternative 2*	*2007 No Action Alternative*
Vegetation	(88)	
Residential	6,642	
Non-Residential	23,115	0
Motor Vehicles	42,332	0
Municipal	860	
Area	56	
Waste	506	
Transit Area	865	
Total	***74,288***	***0***
Alternative 2 - 2007 NAA =		***74,288***
U.S. 2009 Annual Emissions (10^6 metric tons)		*6,633*
Proposed Emissions as a % of U.S. GHG Emissions		*0.00001*
Sources: SFRA 2010; USEPA 2011.		

GHG Environmental Controls

The development plan for Alternative 2 is conceptual, and many of the assumptions used to estimate GHG emissions from proposed operations would result in lower GHG emissions than those that would occur from operations under current standards. To ensure that the final development would comply with these assumptions and result in efficient operations that minimize the generation of GHG emissions, GHG environmental controls 1 through 4 previously discussed under Alternative 1 are proposed for Alternative 2. Implementation of these environmental controls would ensure that GHG emissions impacts to the environment from operation of Alternative 2 would *not be significant* impacts as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2 would not cause any substantial changes in operational GHG emissions from those described for Alternative 2. The climate change impacts from these options would *not be significant* as related to Factor 1.

Factor 2: Operation of Alternative 2 would not conflict with adopted plans or policies to reduce emissions of GHGs.

Similar to Alternative 1, the design of Alternative 2, in concept, includes many of the GHG environmental controls proposed in the AB 32 Scoping Plan, local ordinances, and the SFCAP. Therefore, operation of

Alternative 2 would not conflict with local or state goals to reduce emissions of GHG and impacts would not be significant as related to Factor 2.

GHG Environmental Controls

Implementation of GHG environmental controls 1 through 4 would ensure that impacts from operation of Alternative 2 would *not be significant* as related to Factor 2.

Tower Variant D and the Building Preservation option for Alternative 2, in concept would also include many of the GHG reduction measures proposed in the AB 32 Scoping Plan, local ordinances, and the SFCAP. Therefore, operation of the Tower Variant or the Building Preservation option for Alternative 2 would not conflict with local or state goals to reduce emissions of GHG, and impacts to climate change from these options would *not be significant* as related to Factor 2.

4.2.5 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

4.2.5.1 Construction Impacts

4.2.5.1.1 Criteria and Toxic Air Pollutants

Factor 1: Construction of Alternative 2A would result in emissions that exceed BAAQMD significance criteria.

Fugitive dust and combustive emissions generated from construction of Alternative 2A would be similar to those generated by Alternative 2, as shown in Table 4.2.4-1. The data in Table 4.2.4-1 show that construction of Alternative 2A would produce emissions that would exceed the daily NO_x emissions significance threshold of 54 ppd.

Environmental Controls

To minimize fugitive dust emissions during construction, the construction contractor would implement feasible dust control measures specified by the San Francisco Health Code (Article 22B) and the BAAQMD. The construction contractor would document all proposed environmental controls in a project DCP, as previously discussed under Alternative 1, and would submit the DCP to the BAAQMD and the DCP for approval prior to initiation of ground disturbing activities at the project site. Compliance with these control requirements would reduce fugitive dust emissions from construction by at least 90 percent. However, combustive emissions would still exceed the NO_x daily significance threshold.

To reduce NO_x emissions from construction of Alternative 2A, the lead agency would consider all feasible environmental controls so that emissions would not be significant. One of the most feasible controls for this purpose would be to use a construction equipment fleet that has a high percentage of new equipment, as new equipment has the most current and stringent emission standards. In addition, use of engine exhaust after-treatment devices is also a feasible environmental control to minimize NO_x emissions from construction equipment. However, given the magnitude of proposed construction activities, it would be difficult to reduce proposed construction emissions to below the daily NO_x significance threshold. Therefore, NO_x emissions from construction activities under Alternative 2A would *be significant,* whereas ROG, PM_{10}, and $PM_{2.5}$ emissions from construction would *not be significant* as related to Factor 1.

The option that calls for the preservation of Buildings 208, 211, 224, 231, and 253 would reduce demolition activities and resultant overall combustive and fugitive dust emissions. Minor changes to the project footprint, associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 2A, would not cause any substantial changes in the construction criteria pollutant emissions from those described for Alternative 2A, and the impacts from these options *would be significant* for NO_x emissions but would *not be significant* for ROG, PM_{10}, and $PM_{2.5}$ emissions as related to Factor 1.

Factor 2: Construction of Alternative 2A would not expose sensitive receptors to substantial pollutant concentrations.

The impacts of DPM and chemicals bound to airborne dust emissions from construction of Alternative 2A would be similar to and slightly higher than Alternative 1, due to higher incremental amount of combustive emissions that would be generated during Alternative 2A construction. Similar to Alternative 1, emissions of DPM and chemicals bound to airborne dust due to the construction of Alternative 2A would not exceed the significance thresholds for cancer risk of 10 in a million or HI of 1.0 for non-cancer health effects for any receptor type.

Environmental Controls

To reduce DPM emissions during proposed construction, the construction contractor would implement the environmental control described in section 4.2.2.1.1. With implementation of this control and an approved DCP and ADMP, public health effects impacts from construction of Alternative 2A would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 2A, would not cause any substantial changes in construction toxic air contaminant emissions from those described for Alternative 2A, as similar environmental controls would be applied. The health risks from these options would be similar to those from Alternative 2A and would *not be significant* as related to Factor 2.

4.2.5.1.2 GHGs

Factor 1: Emissions of GHGs from the construction of Alternative 2A would not produce significant impacts to the environment.

Emissions of GHGs from the construction of Alternative 2A would be similar to and slightly higher than Alternative 1, as shown in Table 4.2.2-2, due to the slightly higher amount of development associated with the alternative. Since GHG emissions from Alternative 2A would equate to a minimal amount of the U.S. GHG emissions inventory, they would not substantially contribute to global climate change. Therefore, GHG emissions impacts to the environment from construction of Alternative 2A would *not be significant* as related to Factor 1. Because impacts would not be significant, no mitigation is proposed.

Preservation of Buildings 208, 211, 224, 231, and 253 would reduce proposed construction activity and associated emissions of GHGs. Minor changes to the project footprint, associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 2A would not cause any substantial changes in construction GHG emissions from those described for Alternative 2A, and the impacts from these options would *not be significant* as related to Factor 1.

Factor 2: Construction of Alternative 2A would not conflict with adopted state plans to reduce emissions of GHGs.

Similar to Alternative 1, the proposed construction contractors would implement all applicable GHG emission controls identified in the AB 32 Scoping Plan or the SFCAP. Therefore, construction of Alternative 2A would not conflict with the goals of the city or the state to reduce emissions of GHG. This would result in impacts to climate change that would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 2A would not cause any substantial changes in the construction GHG emissions from those described for Alternative 2A. The project construction contractors would implement applicable control strategies discussed above, and the impacts from these options would *not be significant* as related to Factor 2.

4.2.5.2 Operational Impacts

4.2.5.2.1 Criteria and Toxic Air Pollutants

Factor 1: Operation of Alternative 2A would exceed BAAQMD emission significance thresholds.

Proposed Alternative 2A operations would generate criteria pollutant emissions from onsite area sources (such as combustion of natural gas for space and water heating and other fuels for building and grounds maintenance equipment) and vehicles that access the project site. The Transportation Study (Section 4.1) estimates that the operation of Alternative 2A at full build-out would generate 34,700 ADT from vehicles (slightly less than Alternative 2 but higher than Alternative 1).

Table 4.2.5-1 summarizes the daily emissions that would be produced from operation of Alternative 2A. These data show that on-road vehicles are the main contributors to all pollutant levels, with the exception of “Area Sources,” which would produce the majority of ROG emissions. In comparison to the 2007 NAA baseline, operation of Alternative 2A would exceed the daily emissions significance thresholds for ROG, NO_x, PM_{10}, and $PM_{2.5}$.

Table 4.2.5-1. Daily Operational Emissions for Alternative 2A - Year 2030 (Pounds per Day)

Scenario/Emission Source	*ROG*	*CO*	*NO_x*	*PM_{10}*	*$PM_{2.5}$*
Alternative 2A					
Area Sources	263	42	78	2	2
Motor Vehicles	106	1,121	126	522	99
Total Alternative 2A	**369**	**1,163**	**204**	**524**	**101**
Exceeds BAAQMD Threshold?	**Yes**	**N/A**	**Yes**	**Yes**	**Yes**
2007 No Action Alternative (NAA)					
Area Sources	0	0	0	0	0
Motor Vehicles	0	0	0	0	0
Total 2007NAA	**0**	**0**	**0**	**0**	**0**
Alternative 2A - 2007 NAA =	***369***	***1,163***	***204***	***524***	***101***
Exceeds BAAQMD Threshold?	**Yes**	**N/A**	**Yes**	**Yes**	**Yes**
BAAQMD Significance Threshold	**54**	**N/A**	**54**	**82**	**54**

Source:
Appendix J, Air Emissions Calculations - Construction and Operation of the HPS Project Alternatives (Criteria and GHG Emission Calculations for Air Quality and GHG).

Environmental Controls

By design, Alternative 2A incorporates features that would minimize motor vehicle trips and energy usages in buildings. As a result, there are no additional feasible environmental controls identified at this time that would further reduce operational emissions. Therefore, residual impacts to ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions from the operation of Alternative 2A *would be significant* as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A would not cause any substantial changes in the operational emissions from those described for Alternative 2A, and the impacts from these options *would be significant* for ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions as related to Factor 1.

Factor 2: Operation of Alternative 2A would not expose nearby receptors to substantial pollutant concentrations.

As previously described for Alternative 1, an HHRA was performed to evaluate the ambient impacts of proposed TAC emissions that would occur within areas designated for R&D uses based on a worst-case scenario analysis, which corresponds to Alternative 2 (SFRA 2010). The Alternative 2 emission estimates were used to evaluate their excess lifetime cancer risk and chronic non-cancer health effects at surrounding receptor locations. The results of this worst-case scenario HHRA determined that operational emissions of TACs from Alternative 2 would not result in exceedance of the significance thresholds of 10 per million for cancer risk or HI of 1.0 for non-cancer health effects for any receptor type (SFRA 2010).

As discussed in section 4.2.1.2.2, the following presents an estimate of the impact of emissions from Alternative 2A based on the HHRA conducted for Alternative 2. Alternative 2A would involve 40 percent of the R&D land use and resulting emissions of TACs compared to Alternative 2 scenario evaluated in the HHRA.

The results of the HHRA analysis would apply equally in comparison to the 2007 NAA baseline, since those emissions would be negligible. Therefore, netting out the impacts of these baseline emissions from Alternative 2A emissions in the HHRA would result in nearly identical residual impacts.

Due to the large number of potential R&D facilities with sources of TAC emissions, and due to their proximity to adjacent receptors, unmitigated impacts from these land uses could potentially exceed either the cancer risk or HI significance thresholds. Therefore, implementation of the following environmental controls would ensure that impacts to public health from operation of Alternative 2A would *not be significant* health impacts as related to Factor 2.

Environmental Controls

To minimize health risks from proposed sources of TACs from R&D uses, the applicant would implement environmental controls 2 and 3, as described in section 4.2.2.2.1. With implementation of these controls, impacts to public health from operation of Alternative 2A would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A would not cause any substantial changes in operational emissions from those described for Alternative 2A, and the health risks from these options would *not be significant* as related to Factor 2.

Factor 2: Vehicle emissions ($PM_{2.5}$) due to the Operation of Alternative 2A would not exceed DPH thresholds or produce significant health impacts to nearby receptors.

Operation of Alternative 2A would increase vehicle trips and associated emissions along local roadways. These vehicle emissions could expose residents who live in proximity to these roads to adverse health effects. The following presents an estimate of the impact of emissions from Alternative 2A traffic to ambient $PM_{2.5}$ levels based on the CAL3QHCR dispersion modeling analysis performed for traffic generated in the EIR (SFRA 2010).

Alternative 2A would generate substantially less traffic (34,700 ADT) and resulting $PM_{2.5}$ emissions compared to the scenario (78,109 ADT) evaluated in the EIR dispersion modeling analysis. The results of the analysis completed in the EIR determined that vehicular emissions from 78,109 ADT would not expose residential receptors along roadways in proximity to the project site to annual $PM_{2.5}$ concentrations in excess of the DPH's 0.2 $\mu g/m^3$ threshold (SFRA 2010).

Because of the significantly lower level of traffic associated with Alternative 2A (34,700 ADT), it can be concluded that ambient impact of $PM_{2.5}$ emissions generated by Alternative 2A traffic would not exceed the DPH's annual $PM_{2.5}$ threshold of 0.2 $\mu g/m^3$. As a result, health impacts from traffic generated by Alternative 2A would *not be significant* as related to Factor 2.

The results of the analysis for Alternative 2A were also compared to the 2007 NAA baseline, which would generate negligible vehicular emissions from the project site during this time period. Therefore, netting out of these baseline emissions would result in nearly identical residual impacts as those estimated for Alternative 2A. As a result, residual health impacts from traffic generated by Alternative 2A would *not be significant* as related to Factor 2. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A would not cause any substantial changes in operational emissions from those described for Alternative 2A. The $PM_{2.5}$ ambient impacts from these options would *not be significant* as related to Factor 2.

Factor 3: Operation of Alternative 2A would not contribute to an exceedance of an ambient air quality standard.

Emissions from traffic generated by Alternative 2A would contribute to localized CO impacts. The following presents an estimate of CO impacts based on the EIR CALINE4 dispersion modeling analysis performed for the combined traffic generated from the proposed HPS and Candlestick Point sites, or 78,109 ADT (SFRA 2010), as summarized in Table 4.2.2-4. These data show that CO emissions from traffic generated by this worst-case scenario would not contribute to an exceedance of a CO ambient air quality standard. Alternative 2A would generate substantially less traffic (34,700 ADT) and resulting CO emissions compared to the analyzed scenario. Therefore, in comparison to the 2007 NAA baseline, impacts to ambient air quality levels for Alternative 2A would *not be significant* levels as related to Factor 3. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A would not cause any substantial changes in traffic-related CO emissions from those described for Alternative 2A. The CO ambient impacts from these options would *not be significant* as related to Factor 3.

Factor 4: Operation of Alternative 2A would not conflict with or obstruct implementation of the regional air quality plans.

Similar to Alternative 1, Alternative 2A would be consistent with emission control measures proposed in the *Bay Area 2005 Ozone Strategy* and the adopted *Bay Area 2010 CAP* (BAAQMD 2010). Alternative 2A would promote implementation of the regional air quality plans and impacts would *not be significant* as related to Factor 4.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A would not cause any substantial changes in location of stationary sources and mobile source emissions from those described for Alternative 2A. Thus, similar to Alternative 2A, these options would promote implementation of the regional air quality plans and impacts would *not be significant* as related to Factor 4.

Factor 5: Operation of Alternative 2A would not generate objectionable odors affecting a substantial number of people.

Alternative 2A does not propose any land uses that the BAAQMD considers to have the potential for generating significant odors. The large mixed-use development proposed by Alternative 2A has the potential to generate small and localized sources of odor emissions, such as from food preparation or solid waste collection. In the event that there are public concerns about these new odors, it is expected that the operators of these sources would reduce their emissions to below nuisance levels. Therefore, odor impacts from operation of Alternative 2A would *not be significant* as related to Factor 5. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A would not cause any substantial changes in location or type of stationary sources from those described for Alternative 2A, and odor impacts from these options would *not be significant* as related to Factor 5.

4.2.5.2.2 GHGs

Factor 1: Emissions of GHGs from the operation of Alternative 2A would not produce significant impacts to the environment.

Table 4.2.5-2 summarizes the total annual GHG emissions that would occur from the operation of Alternative 2A upon full build-out. The reduction in GHG emissions resulting from the amount of CO_2 sequestered by new plantings as a result of GHG environmental control 1 are accounted for under the vegetation source in Table 4.2.5-2. These data show that proposed operations would emit a total of 69,602 mt tons of CO_2e emissions in 2030, assuming a zero baseline for 2007 NAA conditions. Since GHG emissions from Alternative 2A would equate to a minimal amount of the U.S. GHG emissions inventory, they would not substantially contribute to global climate change.

Table 4.2.5-2. Alternative 2A Operations - Annual CO_2e Emissions (mt per Year)

Source	***Alternative 2A***	***2007 No Action Alternative***
Vegetation	(88)	
Residential	10,715	
Non-Residential	14,340	0
Motor Vehicles	41,944	0
Municipal	1,236	
Area	90	
Waste	500	
Transit Area	865	
Total	***69,601***	***0***
Alternative 2A minus 2007 NAA =		***69,601***
U.S. 2009 Annual GHG Emissions (10^6 metric tons)		*6,633*
Proposed Emissions as a % of U.S. GHG Emissions		*0.00001*
Sources: SFRA 2010; USEPA 2011.		

GHG Environmental Controls

The development plan for Alternative 2A is conceptual and many of the assumptions used to estimate GHG emissions from proposed operations would result in lower GHG emissions than those that would occur from operations under current standards. To ensure that the final development would comply with these assumptions and would result in efficient operations that minimize the generation of GHG emissions, GHG environmental controls 1 through 4, previously discussed under Alternative 1, are proposed for Alternative 2A. Implementation of these environmental controls would ensure that GHG emissions impacts from the operation of Alternative 2A would *not be significant* as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A would not cause any substantial changes in operational GHG emissions from those described for Alternative 2A, and climate change impacts from these options would *not be significant* as related to Factor 1.

Factor 2: Operation of Alternative 2A would not conflict with adopted plans or policies to reduce emissions of GHGs.

Similar to Alternative 1, the design of Alternative 2A, in concept, includes many of the GHG reduction measures proposed in the AB 32 Scoping Plan, local ordinances, and the SFCAP. Therefore, operation of Alternative 2A would not conflict with local or state goals to reduce emissions of GHG, and impacts would *not be significant* as related to Factor 2.

GHG Environmental Controls

With implementation of GHG environmental controls 1 through 4, impacts from operation of Alternative 2A would *not be significant* impacts as related to Factor 2.

Tower Variant D and the Building Preservation option for Alternative 2A, in concept would also include many of the GHG reduction measures proposed in the AB 32 Scoping Plan, local ordinances, and the SFCAP. Therefore, operation of the Tower Variant or the Building Preservation option for Alternative 2A would not conflict with local or state goals to reduce emissions of GHG and impacts to climate change from these options would *not be significant* as related to Factor 2.

4.2.6 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

4.2.6.1 Construction Impacts

4.2.6.1.1 Criteria and Toxic Air Pollutants

Factor 1: Construction of Alternative 3 would result in emissions that exceed BAAQMD significance criteria.

Fugitive dust and combustive emissions generated from construction of Alternative 3 would be slightly higher than those generated by Alternative 1. Some of the emissions from construction of additional housing under the alternative would be offset by the elimination of emissions from construction of the stadium. The data in Table 4.2.6-1 show that construction of Alternative 3 would produce emissions that would exceed the daily NO_x emissions significance threshold of 54 ppd.

Table 4.2.6-1. Average Daily Combustive Emissions Produced from Construction of Alternative 3

Activity	*Daily Emissions (Pounds per Day)*			
	ROG	*NO_x*	*PM_{10}*	*$PM_{2.5}$*
Average Construction Day	39	197	9	8
BAAQMD Significance Threshold	**54**	**54**	**82**	**54**
Exceeds BAAQMD Threshold?	**No**	**Yes**	**No**	**No**

Environmental Controls

To minimize fugitive dust emissions during construction, the construction contractor would implement feasible dust control measures specified by the San Francisco Health Code (Article 22B) and the BAAQMD. The construction contractor would document all proposed environmental controls in a project DCP, as previously discussed under Alternative 1, and would submit the DCP to the BAAQMD and the DCP for approval prior to initiation of ground disturbing activities at the project site. Compliance with these control requirements would reduce fugitive dust emissions from construction by at least 90 percent. However, combustive emissions would still exceed the NO_x daily significance threshold.

To reduce NO_x emissions from construction of Alternative 3, the lead agency would consider all feasible environmental controls so that emissions would not be significant. One of the most feasible controls for this purpose would be to use a construction equipment fleet that has a high percentage of new equipment, as new equipment has the most current and stringent emission standards. In addition, use of engine exhaust after-treatment devices is also a feasible environmental control to minimize NO_x emissions from construction equipment. Similar to Alternative 1, 50 percent of the proposed construction equipment fleet would meet USEPA Tier 2 standards and would be outfitted with particulate matter controls. However, given the magnitude of proposed construction activities, it would be difficult to reduce proposed construction emissions to below the daily NO_x significance threshold. Therefore, NO_x emissions from construction activities under Alternative 3 *would be significant*, whereas ROG, PM_{10}, and $PM_{2.5}$ emissions from construction would *not be significant* relative to Factor 1.

The option that calls for the preservation of Buildings 208, 211, 224, 231, and 253 would reduce demolition activities and resultant overall fugitive dust and combustive emissions. Minor changes to the project footprint, associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 3 would not cause any substantial changes in the construction criteria pollutant emissions from those described for Alternative 3. The impacts from these options *would be significant* for NO_x emissions but would *not be significant* for ROG, PM_{10}, and $PM_{2.5}$ emissions as related to Factor 1.

Factor 2: Construction of Alternative 3 would not expose sensitive receptors to substantial pollutant concentrations.

The impacts of DPM and chemicals bound to airborne dust emissions from construction of Alternative 3 would be similar to slightly higher compared to Alternative 1, due to the higher incremental amount of combustive emissions that would be generated during Alternative 3 construction. Some of the emissions from construction of additional housing under the alternative would be offset by the elimination of emissions from construction of the stadium. As is the case with Alternative 1, emissions of DPM and chemicals bound to airborne dust due to the construction of Alternative 3 would not exceed the significance thresholds for cancer risk of 10 in a million or HI of 1.0 for non-cancer health effects for any receptor type.

Environmental Controls

To reduce DPM emissions during proposed construction, the construction contractor would implement the environmental control described in section 4.2.2.1.1. With implementation of this control and an approved DCP and ADMP, public health impacts from construction of Alternative 3 would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 3 would not cause any substantial changes in construction TAC emissions from those described for Alternative 3. The health risks from these options would be similar to those from Alternative 3, and would *not be significant* as related to Factor 2.

4.2.6.1.2 GHGs

Factor 1: Emissions of GHGs from the construction of Alternative 3 would not produce significant impacts to the environment.

Emissions of GHGs from the construction of Alternative 3 would be similar to and slightly higher compared to Alternative 1, due to the slightly higher amount of development associated with the alternative. Some of the emissions from construction of additional housing under the alternative would be offset by the elimination of emissions from construction of the stadium. Since GHG emissions from Alternative 3 would equate to a minimal amount of the U.S GHG emissions inventory, they would not substantially contribute to global climate change. Therefore, GHG emissions impacts to the environment from construction of Alternative 3 would *not be significant* as related to Factor 1. Because impacts would not be significant, no mitigation is proposed.

Preservation of Buildings 208, 211, 224, 231, and 253 would reduce proposed construction activity and associated emissions of GHGs. Minor changes to the project footprint associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 3 would not cause any substantial changes in construction GHG emissions from those described for Alternative 3, and the impacts from these options would *not be significant* as related to Factor 1.

Factor 2: Construction of Alternative 3 would not conflict with adopted state plans to reduce emissions of GHGs.

Similar to Alternative 1, the proposed construction contractors would implement all applicable GHG emission control measures identified in the AB 32 Scoping Plan or the SFCAP. Therefore, construction of Alternative 3 would not conflict with the goals of the city or the state to reduce emissions of GHG. This would result in impacts to climate change that would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the reduction in construction activities related to the Building Preservation option for Alternative 3 would not cause any substantial changes in the construction GHG emissions from those described for Alternative 3. The project construction contractors would implement applicable control strategies discussed above, and the impacts from these options would *not be significant* as related to Factor 2.

4.2.6.2 Operational Impacts

4.2.6.2.1 Criteria and Toxic Air Pollutants

Factor 1: Operation of Alternative 3 would exceed BAAQMD emission significance thresholds.

Proposed Alternative 3 operations would generate criteria pollutant emissions from onsite area sources (such as combustion of natural gas for space and water heating and other fuels for building and grounds maintenance equipment) and vehicles that access the project site. The Transportation Study (Section 4.1) estimates that the operation of Alternative 3 at full build-out would generate 29,645 ADT from vehicles (slightly higher than Alternative 1).

Table 4.2.6-2 summarizes the daily emissions produced from the operation of Alternative 3. These data show that on-road vehicles would be the main contributors to all pollutant levels, with the exception of "Area Sources," which would produce the majority of ROG emissions. In comparison to the 2007 NAA baseline, proposed operations would exceed the BAAQMD daily emissions thresholds for ROG, NO_x, PM_{10}, and $PM_{2.5}$.

Table 4.2.6-2. Daily Operational Emissions for Alternative 3 - Year 2030 (Pounds per Day)

Scenario/Emission Source	*ROG*	*CO*	*NO_x*	*PM_{10}*	*$PM_{2.5}$*
Alternative 3					
Area Sources	244	38	71	2	2
Motor Vehicles	95	1,000	112	468	89
Total Alternative 3	**339**	**1,038**	**183**	**470**	**90**
Exceeds BAAQMD Threshold?	**Yes**	**N/A**	**Yes**	**Yes**	**Yes**
2007 No Action Alternative (NAA)					
Area Sources	0	0	0	0	0
Motor Vehicles	0	0	0	0	0
Total 2007 NAA	**0**	**0**	**0**	**0**	**0**
Alternative 3 - 2007 NAA =	**339**	**1,038**	**183**	**470**	**90**
Exceeds BAAQMD Threshold?	Yes	N/A	Yes	Yes	Yes
BAAQMD Significance Threshold	*54*	*N/A*	*54*	*82*	*54*

Source:
Appendix J, Air Emissions Calculations - Construction and Operation of the HPS Project Alternatives (Criteria and GHG Emission Calculations for Air Quality and GHG).

Environmental Controls

By design, Alternative 3 incorporates features that would minimize motor vehicle trips and energy usages in buildings. As a result, there are no additional feasible environmental controls identified at this time that would further reduce operational emissions. Therefore, residual impacts to ROG, NO_x, PM_{10}, and $PM_{2.5}$ emission from the operation of Alternative 3 *would be significant* as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3, would not cause any substantial changes in the operational emissions from those described for Alternative 3, and the impacts from these options *would be significant* for ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions as related to Factor 1.

Factor 2: Operation of Alternative 3 would not expose nearby receptors to substantial pollutant concentrations.

As described previously for Alternative 1, an HHRA was performed to evaluate the ambient impacts of proposed TAC emissions that would occur within areas designated for R&D uses, based on a worst-case scenario analysis, which corresponds to Alternative 2 (SFRA 2010). The Alternative 2 emission estimates were used to evaluate their excess lifetime cancer risk and chronic non-cancer health effects at surrounding receptor locations. The results of this worst-case scenario HHRA determined that operational emissions of TACs from Alternative 2 would not result in exceedance of the significance thresholds of 10 per million for cancer risk or HI of 1.0 for non-cancer health effects for any receptor type (SFRA 2010).

As discussed in section 4.2.1.2.2, the following presents an estimate of the impact of emissions from Alternative 3, based on the HHRA conducted for Alternative 2. Alternative 3 proposes half the R&D land use and resulting emissions of TACs compared to the Alternative 2 scenario evaluated in the HHRA.

The results of the HHRA analysis would apply equally in comparison to the 2007 NAA baseline, since those emissions would be negligible. Therefore, netting out the impacts of these baseline emissions from Alternative 3 emissions in the HHRA would result in nearly identical residual impacts.

Due to the large number of potential R&D facilities with sources of TAC emissions and their proximity to adjacent receptors, unmitigated impacts from these land uses could potentially exceed either the cancer risk or HI significance thresholds. Therefore, implementation of the following environmental controls would ensure that impacts to public health from operation of Alternative 3 would *not be significant* as related to Factor 2.

Environmental Controls

To minimize health risks from proposed sources of TACs from R&D uses, the applicant would implement environmental controls 2 and 3, as described in section 4.2.2.2.1. With implementation of these controls, impacts to public health from operation of Alternative 3 would *not be significant* as related to Factor 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3 would not cause any substantial changes in operational emissions from those described for Alternative 3, and the health risks from these options would *not be significant* as related to Factor 2.

Factor 2: Vehicle emissions ($PM_{2.5}$) due to the Operation of Alternative 3 would not exceed DPH thresholds or produce significant health impacts to nearby receptors.

Operation of Alternative 3 would increase vehicle trips and associated emissions along local roadways. These vehicle emissions could expose residents who live in proximity to these roads to adverse health effects. The following presents an estimate of the impact of emissions from Alternative 3 traffic to ambient $PM_{2.5}$ levels based on the CAL3QHCR dispersion modeling analysis performed for traffic in the EIR (SFRA 2010).

Alternative 3 would generate substantially less traffic (29,645 ADT) and resulting $PM_{2.5}$ emissions compared to the scenario (78,109 ADT) evaluated in the EIR dispersion modeling analysis. The results of the analysis completed in the EIR determined that vehicular emissions from 78,109 ADT would not expose residential receptors along roadways in proximity to the project site to annual $PM_{2.5}$ concentrations in excess of the DPH's 0.2 $\mu g/m^3$ threshold (SFRA 2010).

Because of the significantly lower traffic associated with Alternative 3 (29,645 ADT) and resulting $PM_{2.5}$ emissions, it can be concluded that ambient impact of $PM_{2.5}$ emissions generated by Alternative 3 traffic would not exceed the DPH's annual $PM_{2.5}$ threshold of 0.2 $\mu g/m^3$. As a result, health impacts from traffic generated by Alternative 3 would *not be significant* as related to Factor 2.

Results of the analysis for Alternative 3 were also compared to the 2007 NAA baseline, which would generate negligible vehicular emissions from the project site during this time period. Therefore, netting out these baseline emissions would result in nearly identical residual impacts from traffic generated by Alternative 3. As a result, residual health impacts from traffic generated by Alternative 3 would *not be significant* as related to Factor 2. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3 would not cause any substantial changes in operational emissions from those described for Alternative 3, and the $PM_{2.5}$ ambient impacts from these options would *not be significant* as related to Factor 2.

Factor 3: Operation of Alternative 3 would not contribute to an exceedance of an ambient air quality standard.

Emissions from traffic generated by Alternative 3 would contribute to localized CO impacts. The following presents an estimate of these CO impacts based on the EIR CALINE4 dispersion modeling analysis performed for traffic generated from the proposed HPS and Candlestick Point sites, or 78,109 ADT (SFRA 2010), as summarized in Table 4.2.2-4. These data show that CO emissions from traffic generated by this worst-case scenario would not contribute to an exceedance of a CO ambient air quality standard. Alternative 3 would generate substantially less traffic (29,645 ADT) and resulting CO emissions compared to the analyzed scenario. Therefore, in comparison to the 2007 NAA baseline, impacts to ambient air quality levels for Alternative 3 would *not be significant* as related to Factor 3. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3 would not cause any substantial changes in traffic-related CO emissions from those described for Alternative 3, and CO ambient impacts from these options would *not be significant* as related to Factor 3.

Factor 4: Operation of Alternative 3 would not conflict with or obstruct implementation of the regional air quality plans.

Similar to Alternative 1, Alternative 3 would be consistent with emission control measures proposed in the *Bay Area 2005 Ozone Strategy* and the adopted *Bay Area 2010 CAP* (BAAQMD 2010). Therefore, Alternative 3 would promote implementation of the regional air quality plans, and impacts would *not be significant* as related to Factor 4.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3 would not cause any substantial changes in location of stationary sources and mobile source emissions from those described for Alternative 3. Thus, similar to Alternative 3, these options would promote implementation of the regional air quality plans and impacts would *not be significant* as related to Factor 4.

Factor 5: Operation of Alternative 3 would not generate objectionable odors affecting a substantial number of people.

Alternative 3 does not propose any land uses that the BAAQMD considers to have the potential for generating significant odors. The large mixed-use development proposed by Alternative 3 has the potential to generate small and localized sources of odor emissions, such as from food preparation or solid waste collection. In the event that there are public concerns about these new odors, it is expected that the operators of these sources would reduce their emissions to below nuisance levels. Therefore, odor impacts from operation of Alternative 3 would *not be significant* as related to Factor 5. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3 would not cause any substantial changes in location or type of stationary sources from those described for Alternative 3, and odor impacts from these options would *not be significant* as related to Factor 5.

4.2.6.2.2 GHGs

Factor 1: Emissions of GHGs from the operation of Alternative 3 would not produce significant impacts to the environment.

Table 4.2.6-3 summarizes the total annual GHG emissions that would occur from the operation of Alternative 3 upon full build-out. The reduction in GHG emissions resulting from the amount of CO_2 sequestered by new plantings as a result of GHG environmental control 1 are accounted for under the vegetation source in Table 4.2.6-3. These data show that proposed operations would emit a total of 59,125 mt of CO_2e emissions in 2030, assuming a zero baseline for 2007 NAA conditions. Since GHG emissions from Alternative 3 would equate to a minimal amount of the U.S. GHG emissions inventory, they would not substantially contribute to global climate change.

Table 4.2.6-3. Alternative 3 Operations - Annual CO_2e Emissions (mt per year)

Source	***Alternative 3***	***2007 No Action Alternative***
Vegetation	(88)	
Residential	10,026	
Non-Residential	13,766	0
Motor Vehicles	32,859	0
Municipal	1,156	
Area	85	
Waste	456	
Transit Area	865	
Total	**59,125**	**0**
Alternative 3 - 2007 NAA =		**59,125**
U.S. 2009 Annual GHG Emissions (10^6 metric tons)		*6,633*
Proposed Emissions as a % of U.S. GHG Emissions		*0.00001*
Sources: SFRA 2010; USEPA 2011.		

GHG Environmental Controls

The development plan for Alternative 3 is conceptual and many of the assumptions used to estimate GHG emissions from proposed operations would result in lower GHG emissions than those that would occur from operations under current standards. To ensure that the final development would comply with these assumptions and would result in efficient operations that minimize the generation of GHG emissions, GHG environmental controls 1 through 4, previously discussed under Alternative 1, are proposed for Alternative 3. With implementation of these environmental controls, GHG emissions impacts from operation of Alternative 3 would *not be significant* as related to Factor 1.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3 would not cause any substantial changes in operational GHG emissions from those described for Alternative 3, and climate change impacts from these options would *not be significant* as related to Factor 1.

Factor 2: Operation of Alternative 3 would not conflict with adopted plans or policies to reduce emissions of GHGs.

Similar to Alternative 1, the design of Alternative 3, in concept, includes many of the GHG environmental controls proposed in the AB 32 Scoping Plan, local ordinances, and the SFCAP. Therefore, operation of Alternative 3 would not conflict with local or state goals to reduce emissions of GHG, and impacts would *not be significant* impacts as related to Factor 2.

GHG Environmental Controls

With implementation of GHG environmental controls 1 through 4, impacts from operation of Alternative 3 would *not be significant* as related to Factor 2.

Tower Variant D and the Building Preservation option for Alternative 3, in concept would also include many of the GHG reduction measures proposed in the AB 32 Scoping Plan, local ordinances, and the SFCAP. Therefore, operation of the Tower Variant or the Building Preservation option for Alternative 3 would not conflict with local or state goals to reduce emissions of GHG, and climate change impacts from these options would *not be significant* as related to Factor 2.

4.2.7 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

4.2.7.1 Construction Impacts

4.2.7.1.1 Criteria and Toxic Air Pollutants

Factor 1: Construction of Alternative 4 would not result in emissions that exceed BAAQMD significance criteria.

Fugitive dust and combustive emissions generated from construction of Alternative 4 would be lower than those generated by Alternative 1, due to the reduced development associated with this alternative. The data in Table 4.2.7-1 shows that construction of Alternative 4 would produce emissions that would exceed the daily NO_x emission significance threshold of 54 ppd.

Table 4.2.7-1. Average Daily Combustive Emissions Produced from Construction of Alternative 4

Activity	Daily Emissions (Pounds per Day)			
	ROG	*NO_x*	*PM_{10}*	*$PM_{2.5}$*
Average Construction Day	25	128	6	5
BAAQMD Significance Threshold	**54**	**54**	**82**	**54**
Exceeds BAAQMD Threshold?	**No**	**Yes**	**No**	**No**

Environmental Controls

To minimize fugitive dust emissions during construction, the construction contractor would implement feasible dust control measures specified by San Francisco Health Code (Article 22B) and the BAAQMD. The construction contractor would document all proposed environmental controls in a project DCP, as previously discussed under Alternative 1, and would submit the DCP to the BAAQMD and the DCP for approval prior to initiation of ground disturbing activities at the project site. Compliance with these control requirements would reduce fugitive dust emissions from construction by at least 90 percent. However, combustive emissions would still exceed the NO_x daily significance threshold.

To reduce NO_x emissions from construction of Alternative 4, the lead agency would consider all feasible environmental controls so that emissions would not be significant. One of the most feasible controls for this purpose would be to use a construction equipment fleet that has a high percentage of new equipment, as new equipment has the most current and stringent emission standards. In addition, use of engine exhaust after-treatment devices is also a feasible environmental control to minimize NO_x emissions from construction equipment. Similar to Alternative 1, 50 percent of the proposed construction equipment fleet would meet USEPA Tier 2 standards and would be outfitted with particulate matter controls. However, given the magnitude of proposed construction activities, it would be difficult to reduce proposed construction emissions to below the daily NO_x significance threshold. Therefore, NO_x emissions from construction activities under Alternative 4 *would be significant*, whereas ROG, PM_{10}, and $PM_{2.5}$ emissions from construction would *not be significant* as related to Factor 1.

Factor 2: Construction of Alternative 4 would not expose sensitive receptors to substantial pollutant concentrations.

The impacts of DPM and chemicals bound to airborne dust emissions from construction of Alternative 4 would be lower than those of Alternative 1, due to lower development associated with the alternative. Similar to Alternative 1, emissions of DPM and chemicals bound to airborne dust due to the construction of Alternative 4 would not exceed the significance thresholds for cancer risk of 10 in a million or HI of 1.0 for non-cancer health effects for any receptor type.

Environmental Controls

To reduce DPM emissions during proposed construction, the construction contractor would implement the environmental control described in section 4.2.2.1.1. With implementation of this control and an approved DCP and ADMP, public health effects from construction of Alternative 4 would *not be significant* as related to Factor 2.

4.2.7.1.2 GHGs

Factor 1: Emissions of GHGs from the construction of Alternative 4 would not produce significant impacts to the environment.

Emissions of GHGs from the construction of Alternative 4 would be lower compared to Alternative 1, due to lower development associated with the alternative. Since GHG emissions from construction of Alternative 4 would equate to a minimal amount of the U.S. GHG emissions inventory, they would not substantially contribute to global climate change. Therefore, GHGs emissions impacts from construction of Alternative 4 would *not be significant* as related to Factor 1. Because impacts would not be significant, no mitigation is proposed.

Factor 2: Construction of Alternative 4 would not conflict with adopted state plans to reduce emissions of GHGs.

Similar to Alternative 1, the proposed construction contractors would implement all applicable GHG emission control measures identified in the AB 32 Scoping Plan or the SFCAP. Therefore, construction of Alternative 4 would not conflict with the goals of the city or the state to reduce emissions of GHG. This would result in impacts to climate change that would *not be significant* as related to Factor 2.

4.2.7.2 Operational Impacts

4.2.7.2.1 Criteria and Toxic Air Pollutants

Factor 1: Operation of Alternative 4 would exceed BAAQMD emission significance thresholds.

Proposed Alternative 4 operations would generate criteria pollutant emissions from onsite area sources (such as combustion of natural gas for space and water heating and other fuels for building and grounds maintenance equipment) and vehicles that access the project site. The Transportation Study (Section 4.1) estimates that the operation of Alternative 4 at full build-out would generate 22,636 ADT from vehicles (slightly lower than Alternative 1).

Table 4.2.7-2 summarizes the daily emissions produced from the operation of Alternative 4. These data show that on-road vehicles would be the main contributors to all pollutant levels, with the exception of "Area Sources," which would produce the majority of ROG emissions. In comparison to the 2007 NAA baseline, proposed operations would exceed the significance daily emissions thresholds for ROG, NO_x, PM_{10}, and $PM_{2.5}$.

Table 4.2.7-2. Daily Operational Emissions for Alternative 4 - Year 2030 (Pounds per day)

Scenario/Emission Source	*ROG*	*CO*	*NO_x*	*PM_{10}*	*$PM_{2.5}$*
Alternative 4					
Area Sources	118	21	38	1	1
Motor Vehicles	66	690	78	321	61
Total Alternative 4	***184***	***712***	***115***	***322***	***62***
Exceeds BAAQMD Threshold?	**Yes**	**N/A**	**Yes**	**Yes**	**Yes**
2007 No Action Alternative (NAA)					
Area Sources	0	0	0	0	0
Motor Vehicles	0	0	0	0	0
Total 2007NAA	**0**	**0**	**0**	**0**	**0**
Alternative 4 - 2007NAA =	***184***	***712***	***115***	***322***	***62***
Exceeds BAAQMD Threshold?	**Yes**	**N/A**	**Yes**	**Yes**	**Yes**
BAAQMD Significance Threshold	***54***	***N/A***	***54***	***82***	***54***

Source:
Appendix J, Air Emissions Calculations - Construction and Operation of the HPS Project Alternatives (Criteria and GHG Emission Calculations for Air Quality and GHG).

Environmental Controls

By design, Alternative 4 incorporates features that would minimize motor vehicle trips and energy usages in buildings. As a result, there are no additional feasible environmental controls identified at this time that would further reduce operational emissions. Therefore, residual impacts to ROG, NO_x, PM_{10}, and $PM_{2.5}$ emission levels from the operation of Alternative 4 *would be significant* as related to Factor 1.

Factor 2: Operation of Alternative 4 would not expose nearby receptors to substantial pollutant concentrations.

As described previously for Alternative 1, an HHRA was performed to evaluate the ambient impacts of proposed TAC emissions that would occur within areas designated for R&D uses based on a worst-case scenario analysis, which corresponds to Alternative 2 (SFRA 2010). The Alternative 2 emission estimates were used to evaluate their excess lifetime cancer risk and chronic non-cancer health effects at surrounding receptor locations. The results of this worst-case scenario HHRA determined that operational emissions of TACs from Alternative 2 would not result in exceedance of the significance thresholds of 10 per million for cancer risk or HI of 1.0 for non-cancer health effects for any receptor type (SFRA 2010).

As discussed in section 4.2.1.2.2, the following presents an estimate of the impact of emissions from Alternative 4 based on the HHRA conducted for Alternative 2. Alternative 4 proposes 35 percent of the R&D land use and resulting emissions of TACs compared to the Alternative 2 scenario evaluated in the HHRA.

The results of the HHRA would apply equally in comparison to the 2007 NAA baseline, since those emissions would be negligible. Therefore, netting out these baseline emissions from Alternative 4 emissions in the HHRA would result in nearly identical residual impacts.

Due to the large number of potential R&D facilities with sources of TAC emissions and their proximity to adjacent receptors, unmitigated impacts from these land uses could potentially exceed either the cancer risk or HI significance thresholds. Therefore, with implementation of the following environmental controls, impacts to public health from operation of Alternative 4 would *not be significant* as related to Factor 2.

Environmental Controls

To minimize health risks from proposed sources of TACs from R&D uses, the applicant would implement environmental controls 2 and 3, as described in section 4.2.2.2.1. With implementation of these controls, impacts to public health from the operation of Alternative 4 would *not be significant* as related to Factor 2.

Factor 2: Vehicle emissions ($PM_{2.5}$) due to the Operation of Alternative 4 would not exceed DPH thresholds or produce significant health impacts to nearby receptors.

Operation of Alternative 4 would increase vehicle trips and associated emissions along local roadways. These vehicle emissions could expose residents who live in proximity to these roads to adverse health effects. The following presents an estimate of the impact of emissions from Alternative 4 traffic to ambient $PM_{2.5}$ levels based on the CAL3QHCR dispersion modeling analysis for traffic in the EIR (SFRA 2010).

Alternative 4 would generate substantially less traffic (22,636 ADT) and resulting $PM_{2.5}$ emissions compared to the scenario evaluated in the EIR dispersion modeling analysis (78,109 ADT). The results of the analysis completed in the EIR determined that vehicular emissions from 78,109 ADT would not expose residential receptors along roadways in proximity to the project site to annual $PM_{2.5}$ concentrations in excess of the DPH's 0.2 $\mu g/m^3$ threshold (SFRA 2010).

Because of the significantly lower traffic associated with Alternative 4 (22,636 ADT) and resulting $PM_{2.5}$ emissions, it can be concluded that ambient impact of $PM_{2.5}$ emissions generated by Alternative 4 traffic would not exceed the DPH's annual $PM_{2.5}$ threshold of 0.2 $\mu g/m^3$. As a result, health impacts from traffic generated by Alternative 4 would *not be significant* as related to Factor 2.

Results of the analysis for Alternative 4 were also compared to the 2007 NAA baseline, which would generate negligible vehicular emissions from the project site during this time period. Therefore, netting out these baseline emissions would result in nearly identical residual impacts as those estimated for Alternative 4. As a result, residual health impacts from traffic generated by Alternative 4 would *not be significant* as related to Factor 2. Because impacts would not be significant, no mitigation is proposed.

Factor 3: Operation of Alternative 4 would not contribute to an exceedance of an ambient air quality standard.

Emissions from traffic generated by Alternative 4 would contribute to localized CO impacts. The following presents an estimate of these CO impacts based on the EIR CALINE4 dispersion modeling analysis performed for the combined traffic generated from the proposed HPS and Candlestick Point sites, or 78,109 ADT (SFRA 2010), as summarized in Table 4.2.2-4. These data show that CO emissions from traffic generated by this worst-case scenario would not contribute to an exceedance of a CO ambient air quality standard. This analysis is based on impacts from the analyzed scenario. Alternative 4 would generate substantially less traffic (22,636 ADT) and resulting CO emissions compared to the analyzed scenario. Therefore, in comparison to the 2007 NAA baseline, impacts to ambient air quality levels for Alternative 4 would *not be significant* as related to Factor 3. Because impacts would not be significant, no mitigation is proposed.

Factor 4: Operation of Alternative 4 would not conflict with or obstruct implementation of the regional air quality plans.

Similar to Alternative 1, Alternative 4 would be consistent with emission control measures proposed in the *Bay Area 2005 Ozone Strategy* and the adopted *Bay Area 2010 CAP* (BAAQMD 2010). Alternative 4 would promote implementation of the regional air quality plans, and impacts would *not be significant* as related to Factor 4.

Factor 5: Operation of Alternative 4 would not generate objectionable odors affecting a substantial number of people.

Alternative 4 does not propose any land uses that the BAAQMD considers to have the potential for generating significant odors. The large mixed-use development proposed by Alternative 4 has the potential to generate small and localized sources of odor emissions, such as from food preparation or solid waste collection. In the event that there are public concerns about these new odors, it is expected that the operators of these sources would reduce their emissions to below nuisance levels. Therefore, odor impacts from operation of Alternative 4 would *not be significant* as related to Factor 5. Because impacts would not be significant, no mitigation is proposed.

4.2.7.2.2 GHGs

Factor 1: Emissions of GHGs from the operation of Alternative 4 would not produce significant impacts to the environment.

Table 4.2.7-3 summarizes the total annual GHG emissions that would occur from the operation of Alternative 4 upon full build-out. The reduction in GHG emissions resulting from the amount of CO_2 sequestered by new plantings as a result of GHG environmental control 1 are accounted for under the vegetation source in Table 4.2.7-3. These data show that proposed operations would emit a total of 41,356 mt of CO_2e emissions in 2030, assuming a zero baseline for 2007 NAA conditions. Since GHG emissions from Alternative 4 would equate to a minimal amount of the U.S. GHG emissions inventory, they would not substantially contribute to global climate change.

Table 4.2.7-3. Alternative 4 Operations - Annual CO_2e Emissions (mt per year)		
Source	***Alternative 4***	***2007 No Action Alternative***
Vegetation	(88)	
Residential	4,649	
Non-Residential	10,002	0
Motor Vehicles	25,090	0
Municipal	536	
Area	39	
Waste	263	
Transit Area	865	
Total	**41,356**	**0**
Alternative 4 - 2007 NAA =		**41,356**
U.S. 2009 Annual GHG Emissions (10^6 metric tons)		*6,633*
Proposed Emissions as a % of U.S. GHG Emissions		*0.00001*
Sources: SFRA 2010; USEPA 2011.		

GHG Environmental Controls

The development plan for Alternative 4 is conceptual and many of the assumptions used to estimate GHG emissions from proposed operations would result in lower GHG emissions than those that would occur from operations under current standards. To ensure that the final development would comply with these assumptions and would result in efficient operations that minimize the generation of GHG emissions, GHG environmental controls 1 through 4, previously discussed under Alternative 1, are proposed for Alternative 4. With implementation of these environmental controls, GHGs emissions impacts from operation of Alternative 4 would *not be significant* as related to Factor 1.

Factor 2: Operation of Alternative 4 would not conflict with adopted plans or policies to reduce emissions of GHGs.

Similar to Alternative 1, the design of Alternative 4, in concept, includes many of the GHG reduction measures proposed in the AB 32 Scoping Plan, local ordinances, and the SFCAP. Therefore, operation of Alternative 4 would not conflict with local or state goals to reduce emissions of GHG and impacts would *not be significant* as related to Factor 2.

GHG Environmental Controls

With implementation of GHG environmental controls 1 through 4, impacts from operation of Alternative 4 would *not be significant* as related to Factor 2.

4.2.8 No Action Alternative

Under the No Action Alternative, the portion of HPS proposed for development under the Stadium Plan and Non-Stadium Plan Alternatives would not be disposed of nor would it be redeveloped. It would remain a closed federal property under caretaker status. Thus, limited activities would occur at the site, including continuation of environmental cleanup, periodic inspections and maintenance of the site, security patrols, and continuation of land management programs. The air quality impacts from these activities are considered negligible and impacts would *not be significant* as related to all air quality and GHG significance factors identified above in Section 4.2.1.1.

4.2.9 Mitigation

Table 4.2.9-1 describes the significant impacts for the proposed action and alternatives, which already incorporate all feasible environmental controls to minimize air quality impacts. However, in a few instances the air quality impacts would remain significant. No mitigations are proposed.

Table 4.2.9-1. Mitigations for Potential Significant Impacts for the Proposed Action and Alternatives

Significance Factor	***Mitigation Measures***						
	Alternative 1 (Stadium Plan Alternative)	*Alternative 1A (Stadium Plan/No-Bridge Alternative)*	*Alternative 2 (Non-Stadium Plan/Additional R&D Alternative)*	*Alternative 2A (Non-Stadium Plan/Housing and R&D Alternative)*	*Alternative 3 (Non-Stadium Plan/Additional Housing Alternative)*	*Alternative 4 (Non-Stadium Plan/Reduced Development Alternative)*	*No Action Alternative*
Factor 1: Net increase of Criteria Pollutants in Non Attainment Area - Construction	***Mitigation:*** No feasible mitigation measures identified beyond proposed environmental controls, Section 4.2.2.1.1. ***Residual Impact After Mitigation:*** Significant and unavoidable.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts would be expected and no mitigation proposed.
Factor 1: Net increase of Criteria Pollutants in Non Attainment Area - Operations	***Mitigation:*** No feasible mitigation measures identified beyond the proposed environmental controls, Section 4.2.2.2.1. ***Residual Impact After Mitigation:*** Significant and unavoidable	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts would be expected and no mitigation proposed.

4.3 Noise

4.3.1 Methodology

4.3.1.1 Significance Factors

The following quantitative significance factors are specifically included in the City of San Francisco General Plan or Noise Ordinance, with which future project construction and operation would need to comply. These are also used in the significance factors defined at the end of this section. The noise or vibration impact associated with the project site would be considered significant if it would:

During Construction

- Generate construction noise between the hours of 8:00 P.M. and 7:00 A.M. that exceeds the ambient noise level by 5 dBA at the nearest property line (unless a special permit has been granted by the Director of Public Works or the Director of Building Inspection); or produce noise by any construction equipment (other than impact tools) that would exceed 80 dBA at 100 ft (30 m).

During Operation

- Cause an increase in noise (as produced by "any machine or device, music or entertainment or any combination of same") greater than 5 dBA or 8 dBA above the local ambient (defined as the "lowest sound level repeating itself during a minimum 10-minute period as measured with a sound level meter, using slow response and A-weighting") at any point outside the property plane of a residential, commercial/industrial or public land use, respectively, containing the noise source.
- In the case of noise or music generated from a "licensed Place of Entertainment," cause an increase in low frequency ambient noise (defined as the "lowest sound level repeating itself during a 10-minute period as measured with a sound level meter, using slow response and C-weighting") by more than 8 dBC.

The FTA has established criteria for the assessment of vibration and noise impacts. These are shown in Tables 4.3.1-1 and 4.3.1-2 and are used as the basis for relevant significance factors described below.

Table 4.3.1-1. Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	***Impact Levels (VdB; relative to 1 micro-inch/second)***		
	Frequent Events[a]	*Occasional Events*[b]	*Infrequent Events*[c]
Category 1: Buildings where vibration would interfere with interior operations	65[d]	65[d]	65[d]
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83

Notes:

a. "Frequent Events" are defined as more than 70 vibration events of the same source per day.
b. "Occasional Events" are defined as between 30 and 70 vibration events of the same source per day.
c. "Infrequent Events" are defined as fewer than 30 vibration events of the same source per day.
d. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define the acceptable vibration levels.

Source: FTA 2006.

Table 4.3.1-2. Federal Transit Administration Impact Criteria for Noise-Sensitive Uses			
Residences and Buildings Where People Normally Sleep[a]		***Institutional Land Uses with Primarily Daytime and Evening Uses[b]***	
Existing L_{dn} (dBA)	*Allowable Noise Increment (dBA)*	*Existing Peak Hour L_{eq} (dBA)*	*Allowable Noise Increment (dBA)*
45	8	45	12
50	5	50	9
55	3	55	6
60	2	60	5
65	1	65	3
70	1	70	3
75	0	75	1
80	0	80	0

Notes:

a. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.

b. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material.

Source: FTA 2006.

The above information was consolidated into the following factors. Factors considered in determining whether an alternative would have significant impacts on noise include the extent or degree to which the implementation of an alternative would result in:

During Construction

Factor 1 Exposure of persons to, or generation of, noise levels in excess of standards established in the Environmental Protection Element of the San Francisco General Plan or San Francisco Noise Ordinance (Article 29, San Francisco Police Code);

Factor 2 Exposure of persons to, or generation of, groundborne vibration or groundborne noise levels in excess of FTA criteria;

Factor 3 Substantial temporary or periodic increase in ambient noise levels in the project vicinity, above levels existing without the project from construction activities;

During Operation

Factor 4 Substantial permanent increase in ambient noise levels in the project vicinity, above levels existing without the project;

Factor 5 Exposure of persons to, or generation of, groundborne vibration or groundborne noise levels in excess of FTA criteria;

Factor 6 Exposure of persons to noise levels in excess of FTA criteria;

Factor 7 Exposure of persons to noise levels in excess of applicable standards in the City of San Francisco General Plan or Noise Ordinance; and/or

Factor 8 Annoyance, activity disruption, or sleep disturbance at the proposed residential uses to be located on the project site, due to noise from San Francisco International Airport (SFO)-related aircraft operations, according to FAA criteria.

4.3.1.2 Analytic Method

Analysis of the existing and future noise environments is based on noise-level monitoring, noise-prediction computer modeling, and empirical observations of receptor noise exposure characteristics. Noise is very site specific and relatively consistent over time, unless there are substantial changes in noise generating activity. Measurements taken in 2009 were considered to be reasonably representative of ambient noise levels for the 2007 baseline year. Long-term 24-hour ambient noise measurements were taken at six locations (Figure 4.3.1-1) in the residential neighborhoods north and west of the project site for a total of three days each in January 2009 and July 2009. Short-term noise levels in 2009 were monitored at selected locations in and around the project site (Figure 4.3.1-2) on 20 May 2009, between the hours of 3:00 P.M. and 6:00 P.M. for 15 minutes each.

Traffic noise modeling procedures involved the calculation of existing and future vehicular noise levels at selected noise-sensitive uses in the vicinity of the project site using the FHWA Traffic Noise Model. The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, truck mix, distance from roadway to receptor, and site environmental conditions. The average vehicle noise generation (energy rates) utilized in the Traffic Noise Model reflects the latest measurements of average vehicle noise rates for all vehicle classes. Traffic volumes utilized as data inputs in the noise prediction model were provided through the traffic analysis prepared for this SEIS. For purposes of analysis, and for those alternatives and variants for which traffic data were generated, the average peak-hour traffic volumes were extrapolated from the project traffic study and input into the model to estimate existing and future traffic noise levels on roadway segments in the project vicinity where existing or reasonably foreseeable sensitive receptors are located. For alternatives and variants for which no specific traffic data were generated, traffic data from alternatives with comparable traffic generating characteristics were used.

The proposed stadium would be used primarily for football games, but may also be used occasionally for music concerts. The proposed stadium design, measured game and concert noise data gathered from similar existing facilities, the influence of surrounding topography and meteorology, and the location of noise-sensitive receptors (primarily residential) in the area were developed as input parameters to the community noise prediction computer model SoundPLAN®. The sound emission characteristics of both the stadium's "house" sound system (the permanent sound system that would be utilized during football games) and that of a portable system characteristic of concerts were used in the SoundPLAN® model to 1) project noise levels in the community for both games and concerts; 2) to evaluate whether noise impacts would potentially occur; and 3) determine the possible need for mitigation and the details of such mitigation.

Aircraft noise levels on the project site were estimated using available data from SFO. The noise analysis considered the existing Community Noise Equivalent Level (CNEL) and SFO sound exposure level (SEL) noise data contours as likely exposures for the proposed residential uses on site.

Construction noise and vibration levels were quantified using equipment noise reference levels and modeling techniques developed by the FTA.

For each alternative, the impact assessment is based on the 2009 baseline conditions (considered to be essentially the same as 2007 with respect to noise). The 2009/2007 conditions represent the current baseline, and are consistent with those used in the FEIR prepared for the project by the city and SFRA.

An evaluation of noise impacts was also performed in comparison to the project site using the 1993 baseline evaluated in the 2000 FEIS. Appendix M of this SEIS contains that analysis. In comparison to the baseline used here, the 1993 baseline noise environment was characterized by somewhat higher noise

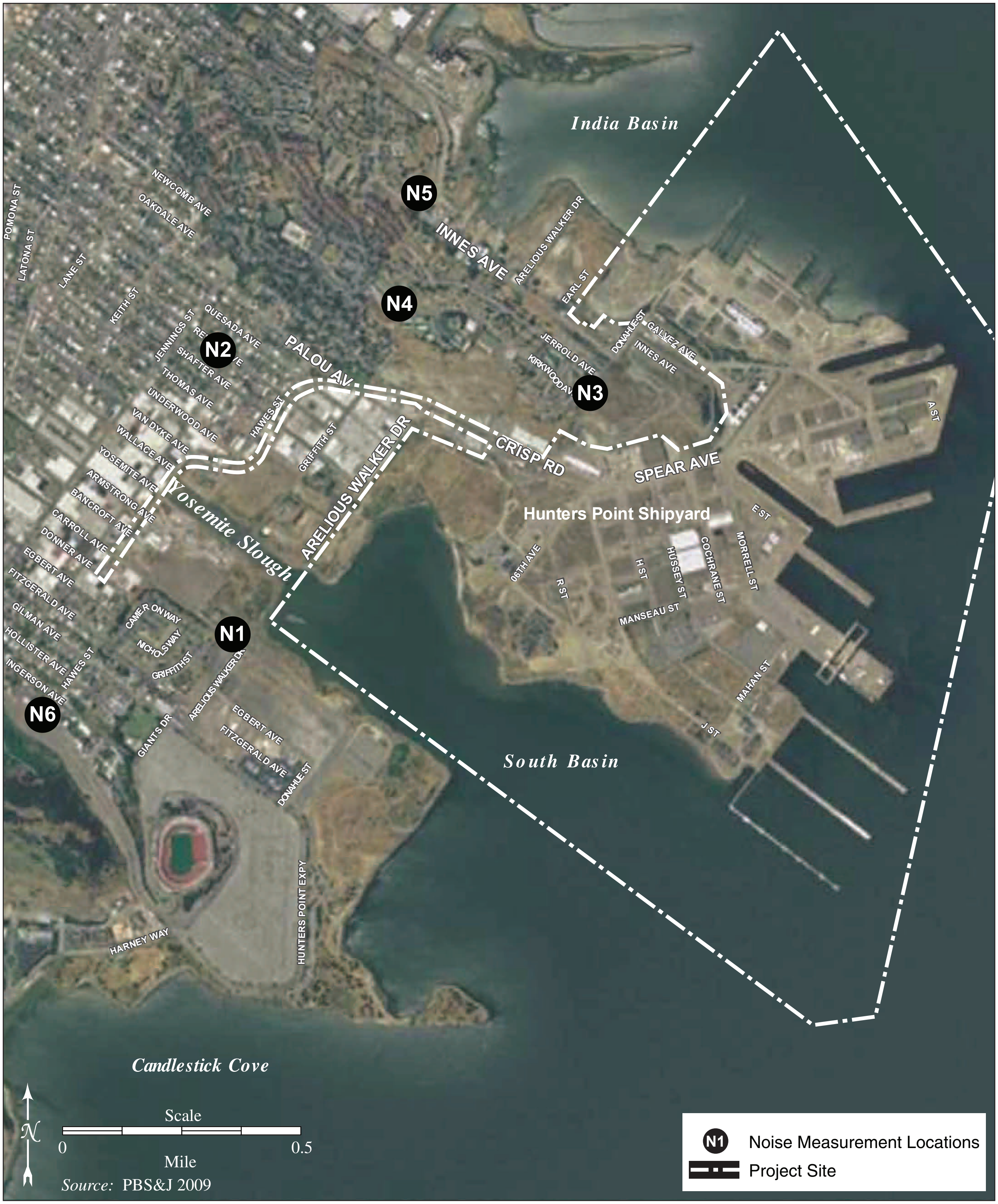


Figure 4.3.1-1. Long Term Ambient Noise Measurement Locations

Figure 4.3.1-2. Short Term Ambient Noise Measurement Locations

levels than the 2007 baseline since overall activity levels in 1993 marginally exceeded those in 2007. Using noise levels measured in 2007/2009, as is done here, establishes a conservative basis for assessing noise impacts compared to a 1993 baseline. Therefore, while the impacts evaluated based on a 1993 baseline would be marginally lower than those described herein using a 2007 baseline, they are broadly consistent with each other. Also, it should be noted that construction impacts are not evaluated with respect to adjacent land uses that exist in a particular baseline year, but in the context of land uses that would be in effect when the construction occurs. A land use that does not exist in the baseline year (e.g., future housing) would still be affected by construction when that activity occurs after the housing was completed and occupied. Impacts in that case are assessed based on the expected level of noise generated by project activities in the vicinity of the future land uses and the distances between the future sensitive receptors and the construction or operational activity.

4.3.2 Alternative 1: Stadium Plan Alternative

Under Alternative 1, a new stadium would be constructed. Approximately 2,650 housing units would be developed within the project site and 7,255 new jobs would result. The number of construction personnel required at any given time would be similar to the total project for the Stadium Plan Alternative. A Yosemite Slough bridge that would serve only transit, bike, and pedestrian traffic would extend Arelious Walker Dr from Candlestick Point to HPS. The bridge would accommodate vehicle traffic only on game days. This alternative includes a variant that would increase the footprint of Tower D by a small amount, if constructed.

4.3.2.1 Construction Impacts

For HPS, new development would begin with the construction of the football stadium. HPS North district residential development would begin during 2012, and is planned for completion by 2019. Build-out of the R&D district is planned by 2027. The mixed-use, neighborhood retail and residential development at the HPS Village Center district would be completed in 2023. Other facilities construction would continue to 2032. Tower Variant D would increase the footprint by a small amount, and while this would make a minor difference to construction noise generation related to tower construction, it would not alter the impact analyses for construction in the next sections.

4.3.2.1.1 Factor 1: Exposure to Excessive Construction Noise Levels

Construction Impacts at Offsite Noise-Sensitive Receptors

Offsite roadway improvements to Innes Avenue would result in construction activities occurring within 25 ft (8 m) of residential uses along Innes Avenue. Noise levels associated with these offsite roadway improvements would be approximately 85 dBA at 50 ft (15 m); at 25 ft (8 m), which is a halving of distance, noise levels would increase by 6 dBA, which would result in a noise level of 91 dBA due to grading activities. Equipment noise levels are shown in Table 4.3.2-1.

Construction of the proposed football stadium would require pile-driving activities. Pile drivers produce noise levels of 101 dBA at 50 ft (15 m) from the source. The closest offsite noise-sensitive receptor to the proposed football stadium would be the residential uses being developed in HPS Phase I (not part of the HPS project). These residential uses are located approximately 600 ft (180 m) from the proposed stadium; therefore, as stationary noise levels diminish by 6 dBA per doubling of distance, it is estimated that the greatest construction noise levels (during temporary pile driving activities) associated with construction of the stadium would be 77 dBA to 83 dBA, depending on the exact distance. It should be noted that the residential uses at HPS Phase I are located along a ridge that shields the residential uses from the stadium site, which would serve to further reduce construction related noise levels.

Table 4.3.2-1. Construction Equipment Noise Emission Levels	
Equipment	***Typical Noise Level (dBA) 50 ft (15 m) from Source***
Air Compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88
Source: USEPA 1971	

All offsite construction activities associated with Alternative 1 would be required to comply with Sections 2907 and 2908 of the Noise Ordinance and to implement mitigation (**Mitigations 1 and 2** described below). Compliance with the Noise Ordinance and implementation of the identified mitigation would reduce the impact of construction noise to offsite receptors.

Construction Impacts at Future Onsite Noise-Sensitive Receptors

Based on the construction schedule, construction activities associated with the stadium, HPS North district, and R&D district would not impact onsite future noise-sensitive uses. However, construction of the HPS Village Center district would occur from 2015 to 2019 while the HPS North district residential uses are occupied (i.e., after the residential construction is complete and new residents have moved in) and, therefore, could potentially impact the HPS North district residential uses.

Construction of the residential and commercial uses in the HPS Village Center district would include the development of high-rise, mixed-use, residential towers. These high-rise towers would require the construction of deep foundations using pile drivers. The HPS Village Center district would be located within 25ft (8 m) of the HPS North district residential uses. Noise levels from temporary pile driving activities could be as high as 101 dBA for the residential uses within the HPS North district. Other construction activities such as grading, excavation, paving, and structural finishing would produce noise levels of up to 89 dBA.

Pile driving activities would also be required for the shoreline improvements within HPS; however, no noise-sensitive uses are located within approximately 500 ft (150 m) of the shoreline improvement areas. Therefore, pile-driving activities associated with the shoreline improvements would not result in excessive noise levels for noise-sensitive human receptors. Potential noise impacts to other (non-human) biological receptors are presented in Section 4.13, Biological Resources.

The conditions under which noise levels would be considered excessive during construction activities such as excavation or pile driving would be temporary, would only occur for the duration of the activity, and would only impact receptors located within 150 ft (45 m) or closer of the noise producing activity. Once that construction activity was completed, the associated noise would no longer be experienced by the affected receptor.

Construction of Alternative 1 must comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. Further, the Noise Ordinance would limit noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 ft (30 m) except where construction activity occurs during allowable hours. Additionally, **Mitigations 1 and 2** would be implemented to reduce noise during construction. Finally, since construction activities would only occur during the hours allowed under Sections 2907 and 2908 of the Noise Ordinance, noise from project construction would not violate any city codes or other requirements placed on construction activity by the city or agency.

Mitigation Measures

Mitigation 1. Construction document mitigation to reduce noise levels during construction.

The future developer or owner of the property would incorporate the following practices into the construction documents to be implemented by the project contractor:

- Provide enclosures and mufflers for stationary equipment, shrouding or shielding for impact tools, and barriers around particularly noisy operations on the site;
- Use construction equipment with lower noise emission ratings whenever possible, particularly air compressors;
- Provide sound-control devices on equipment no less effective than those provided by the manufacturer;
- Locate stationary equipment, material stockpiles, and vehicle staging areas as far as practicable from sensitive receptors;
- Prohibit unnecessary idling of internal combustion engines;
- Require applicable construction-related vehicles and equipment to use designated truck routes to access the project site;
- Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, noise barriers or noise blankets. The placement of such attenuation measures would be

reviewed and approved by the Director of Public Works prior to issuance of development permit for construction activities; and/or

- Designate a Noise Disturbance Coordinator who would be responsible for responding to complaints about noise during construction. The telephone number of the Noise Disturbance Coordinator would be conspicuously posted at the construction site and should be provided to the city. Copies of the construction schedule would also be posted at nearby noise-sensitive areas.

Implementation of this mitigation identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the future developer or owner of the property. The mitigation would need to be approved and implementable prior to the issuance of a site construction permit. The City and County of San Francisco and Department of Building Inspection (DBI) would enforce the mitigation and monitoring for compliance would be the responsibility of the City and County of San Francisco, DBI, and the Department of Public Works (DPW). The City and County of San Francisco would review and approve the contract specifications and the future developer or owner of the property would be required to submit quarterly reports to the City and County of San Francisco demonstrating compliance.

Mitigation 2. Noise-reducing pile driving techniques and muffling devices.

The future developer or owner of the property would require its construction contractor to use noise-reducing pile driving techniques if nearby structures are subject to pile driving noise and vibration. These techniques include pre-drilling pile holes (if feasible, based on soils) to the maximum feasible depth, installing intake and exhaust mufflers on pile driving equipment, vibrating piles into place when feasible, and installing shrouds around the pile driving hammer where feasible.

Implementation of this mitigation identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the future developer or owner of the property. The mitigation would need to be approved and implementable prior to the issuance of a site construction permit. The City and County of San Francisco and DBI would enforce the mitigation and monitoring for compliance would be the responsibility of the City and County of San Francisco, DBI, and the DPW. The City and County of San Francisco would review and approve the contract specifications and the future developer or owner of the property would be required to submit quarterly reports to the City and County of San Francisco demonstrating compliance.

Contractors would be required to use construction equipment with state-of-the-art noise shielding and muffling devices. In addition, at least 48 hours prior to pile-driving activities, the future developer or owner of the property would notify building owners and occupants within 500 ft (150 m) of the project site of the dates, hours, and expected duration of such activities. Therefore, *residual* impacts would *not be significant*, assuming compliance with the Noise Ordinance and implementation of **Mitigations 1 and 2**.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, and *residual* impacts would *not be significant* with implementation of **Mitigations 1 and 2**.

4.3.2.1.2 Factor 2: Exposure to Excessive Construction Vibration Levels

Construction Impacts of Vibration at Offsite Vibration-Sensitive Receptors

Offsite roadway improvements would result in construction activities within 25 ft (8 m) of existing residential uses along Innes Ave. The approximate groundborne vibration levels experienced by adjacent sensitive uses due to construction activities occurring during offsite roadway improvements would be approximately 86 VdB (vibration from loaded trucks). Groundborne vibration generated by construction trucks would be consistent with deliveries that are currently made along roadways in the project vicinity to nearby commercial and industrial activities, and would not increase groundborne vibration above existing levels. Construction of offsite roadway improvements would not expose sensitive receptors off site to excessive groundborne vibration or groundborne noise levels.

Construction of the proposed football stadium would require pile driving. The closest offsite vibration-sensitive receptor to the proposed stadium would be the residential uses located approximately 600 ft (180 m) from the stadium site. Therefore, presuming stationary vibration levels diminish by 9 VdB per doubling of distance, it is estimated that the greatest construction vibration levels (during pile driving activities) associated with construction of the stadium would be 62.5 VdB, which is below the level of significance. Additionally, the elevated location of HPS Phase I would further reduce vibration levels from HPS construction activities. Therefore, construction impacts of vibration at offsite sensitive receptors would *not be significant* and no mitigation is proposed.

Construction Impacts of Vibration at Future Onsite Vibration-Sensitive Receptors

Construction of the residential and commercial uses in the HPS Village Center would include two high-rise towers that would require the construction of deep foundations. The recommended construction method for these deep foundations would be to utilize pile drivers. The HPS Village Center would be located within 50 ft (15 m) of the HPS North district residential uses. Vibration levels from pile driving activities could be as high as 103 VdB for the residential uses within the HPS North district. Groundborne vibration levels associated with offsite roadway improvements along Innes Ave would be 86 VdB due to the vibration from loaded trucks and bulldozers for grading. This would exceed the FTA's 80 VdB threshold for residential uses for infrequent events. Construction activities associated with development of the HPS Village Center district would result in vibration levels of 103 VdB at the newly developed HPS North district residential uses.

Implementation of **Mitigation 1** would help to reduce this impact by requiring that vibration-producing equipment be located as far away from sensitive receptors as practicable. **Mitigation 2** would reduce potentially significant vibration impacts by requiring pre-drilled holes and alternate methods for driving piles, such as a vibratory/sonic pile driver. However, these methods would not reduce impacts from pile driving activities to levels below the thresholds. Implementation of **Mitigation 3**, described below, would require that buildings within 50 ft (15 m) of pile driving activities be monitored to ensure that groundborne vibration does not result in damage to structures.

Similar to construction noise levels, the conditions under which vibration levels would be considered excessive during construction activities, such as excavation or pile driving, would only occur for the duration of the activity and would only impact receptors located within 100 ft (30 m) of the vibration-producing activity. Once these activities were completed, the affected receptors would no longer be impacted. Also, construction activities would only occur during the hours of 7:00 A.M. to 8:00 P.M. as required by Sections 2907 and 2908 of the Noise Ordinance.

Mitigation Measure

Mitigation 3. Pre-construction assessment to minimize pile driving impacts.

The future developer or owner of the property would require its geotechnical engineering contractor to conduct a pre-construction assessment of existing subsurface conditions and the structural integrity of nearby buildings subject to pile driving impacts prior to receiving a building permit. If recommended by the geotechnical engineer, for structures or facilities within 50 ft (15 m) of pile driving, the future developer or owner of the property would require groundborne vibration monitoring of nearby structures.

Such methods and technologies would be based on the specific conditions at the construction site such as, but not limited to, the following:

- Pre-pile driving surveying of potentially affected structures;
- Underpinning of foundations of potentially affected structures, as necessary; and
- Including in the construction plan a monitoring program to detect ground settlement or lateral movement of structures in the vicinity of an excavation. Monitoring results would be submitted to DBI. In the event of unacceptable ground movement, as determined by DBI inspections, all pile driving work should cease, and corrective measures should be implemented. The pile driving program and ground stabilization measures would be reevaluated and approved by DBI.

Implementation of this mitigation identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the future developer or owner of the property. The mitigation assessment would need to be completed and approved prior to the issuance of a site construction permit. The City and County of San Francisco and DBI would enforce the mitigation and monitoring for compliance would be the responsibility of the City and County of San Francisco, DBI, and the DPW. The City and County of San Francisco would review and approve the contract specifications and the future developer or owner of the property would be required to submit quarterly reports to the City and County of San Francisco demonstrating compliance.

Implementation of **Mitigations 1, 2, and 3** would reduce temporary vibration impacts, but not to an insignificant level. Therefore, residual impacts would remain *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, and residual impacts, though temporary, would remain *significant and unavoidable*.

4.3.2.1.3 Factor 3: Increases in Ambient Noise Levels from Construction

Construction activities occurring at the project site and in the project vicinity for roadway and infrastructure improvements would involve demolition, grading, and excavation activities, followed by construction and external finishing of the proposed facilities and associated parking areas, as well as roadway and landscaping improvements. These activities would involve the use of heavy equipment (e.g., Table 4.3.2-1) and pile driving would be required for development of the residential towers in the HPS North district, with noise levels up to 101 dBA at a distance of 50 ft (15 m). Further, the approximate noise levels experienced by adjacent noise-sensitive uses due to construction activities occurring during offsite roadway improvements, which are conservatively assumed to be 25 ft (8 m) from the proposed improvement activity, would be 91 dBA during the loudest offsite activities.

Mitigations 1, 2, and 3 (see above) would minimize or reduce construction-related noise levels to the extent feasible. However, pile-driving and excavation activities would occur intermittently throughout the 18-year construction phasing and, therefore, this temporary increase in ambient noise levels would be noticeable and would likely cause human annoyance. Therefore, while implementation of the above-mentioned mitigation would reduce the noise levels associated with the loudest construction activities noted, residual noise impacts would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, but residual impacts would remain *significant and unavoidable*.

4.3.2.2 Operational Impacts

4.3.2.2.1 Factor 4: Exposure to Excessive Noise Levels

HPS would include development of new commercial, retail, and residential uses. Daily operations would require mechanical cooling systems, deliveries of retail and commercial products, and service activities such as trash collection. These operational activities and systems would occur on a daily basis throughout the project site once operational. Noise levels from these activities and systems would be similar throughout the entire project site on a daily basis. It is anticipated that following build-out the entire project site would have a daily noise environment of a typical urban area with average noise levels ranging between 60 and 70 dBA. Residences would be exposed to exterior noise levels exceeding 60 dBA L_{dn} and interior noise levels exceeding 45 dBA L_{dn}, so the residential noise exposure could be considered significant. **Mitigations 4 and 5** below would reduce exterior and interior noise to levels below the thresholds.

Large-scale HVAC systems would be installed for the new residential, retail, and commercial buildings on the project site. HVAC systems associated with these types of buildings can result in noise levels that average between 50 and 65 dBA L_{eq} at 50 ft (15 m) from the equipment. As a project design feature, HVAC units would be mounted within wells on the rooftops of the proposed buildings and would be screened with sufficient noise insulation by the walls and other building features. Therefore, noise levels would not impact sensitive receptors on or off the project site. HVAC equipment would not be anticipated to produce noise levels that would be 5 dBA above the ambient noise level, which is the threshold under Municipal Code Section 2909(a).

Operation of the project would also involve the delivery of goods to commercial and retail operations associated with the project, as well as refuse pick up for both the commercial and residential components. Two noise sources would be associated with delivery operations: the noise of the diesel engines of the semi-trailer trucks and the backup beeper alarm that sounds when a truck is put in reverse, as required and regulated by Cal-OSHA. The noise generated by idling diesel engines typically ranges between 64 and 66 dBA L_{eq} at 75 ft (22 m). This noise would be temporary in nature, typically lasting no more than five minutes. Backup beepers are required by Cal-OSHA to be at least 5 dBA above ambient noise levels. These devices are highly directional in nature, and when in reverse, the trucks and the beeper alarm would be directed towards the loading area and adjacent commercial structures. Backup beepers are, of course, intended to warn persons who are behind the vehicle when it is backing up. The loading docks associated with the project would be screened from sensitive receptors both onsite and offsite by intervening structures and design of the loading spaces. In addition, noise generated by authorized city refuse collectors would be limited to 75 dBA per Section 2904 of the Municipal Code.

Daily operation of the project such as loading dock activity, regional retail, and other commercial activities would generate noise levels that are comparable to a typical urban environment. As such, mechanical systems, daily deliveries, and trash collection would not result in increases of 5 dBA over the anticipated ambient noise level. Therefore, since the daily operational activity would not exceed the noise standards established by the Municipal Code.

Mitigation Measures

Mitigation 4. **Site planning would consider the use of barriers or buildings to shield residential outdoor activity areas so as to reduce noise levels therein to 60 dBA L_{dn} or less.**

Mitigation 5. **New residences would include sound attenuating building elements such as sound rated windows and doors sufficient to reduce interior levels to 45 dBA L_{dn} or less.**

Mechanical ventilation satisfactory to the local building official would be included so residents can close their windows and doors, if they so chose, to minimize environmental noise. During the detailed design of the residential projects, a report would be prepared and submitted to the local building official as required by California Building Code Title 24 and the City and County of San Francisco, confirming that the design achieves interior noise levels of 45 dBA L_{dn} or less inside the new residences.

Implementation of these mitigations identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the future developer or owner of the property. The mitigations would need to be approved and implementable prior to the issuance of a site construction permit. The City and County of San Francisco and DBI would enforce the mitigations and monitoring for compliance would be the responsibility of the City and County of San Francisco, DBI, and the DPW. The City and County of San Francisco would review and approve the contract specifications and the future developer or owner of the property would be required to submit quarterly reports to the City and County of San Francisco demonstrating compliance.

With implementation of **Mitigations 4 and 5**, *residual* impacts would *not be significant*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, and *residual* impacts would *not be significant* with implementation of **Mitigations 4 and 5**.

4.3.2.2.2 Factor 5: Exposure to Excessive Vibration Levels

Typical background vibration levels in inhabited areas are about 50 VdB. Such vibration background levels would be expected generally on the project site after the completion of all construction activities. These levels would be substantially less than the FTA's vibration impact threshold of 80 VdB for human annoyance. Groundborne vibration resulting from operation of the project would primarily be generated by trucks making periodic service visits or deliveries to the project site (including, but not limited to, garbage trucks, freight trucks, and moving trucks). However, these types of deliveries would be consistent with deliveries that are currently made along roadways in the project vicinity to nearby commercial uses and onsite as a result of ongoing commercial and R&D operations, and would not increase groundborne vibration above existing levels. No substantial sources of groundborne vibration would be built as part of the project. Therefore, since operation of the project would not expose sensitive receptors onsite or offsite to excessive groundborne vibration or groundborne noise levels, potential impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D would not cause substantial changes in noise, and impacts would *not be significant*.

4.3.2.2.3 Factor 6: Exposure to Increased Traffic Noise Levels

The increase in traffic resulting from implementation of the project and ambient growth over the next 20 years would increase the ambient noise levels at noise-sensitive locations along the major vehicular access routes to the project site. Table 4.3.2-2 identifies the changes in future noise levels along the study area roadway segments that have residential uses and, therefore, are sensitive receptors. All future roadway analyses assumed completion of capital improvements as well as roadway improvement measures required as part of the traffic mitigation measures detailed in Section 4.1, Transportation, Traffic, and Circulation. As stated in the significance factors, increases in ambient noise due to increases in project-related traffic are based on the FTA criteria specified in Table 4.3.1-2. As baseline ambient levels increase, smaller and smaller increments are allowed to limit increases in community annoyance, for example, in residential areas with a baseline ambient noise level of 50 dBA L_{dn}, a 5 dBA increase in noise levels would be acceptable, while at 70 dBA L_{dn}, only a 1 dBA increase would be allowed. The increases shown are based on a comparison of calculated future traffic noise levels with existing measured noise levels in the project site area.

Table 4.3.2-2. Modeled Traffic Noise Increases (dBA, L_{dn}) Along Main Area Roadways - Alternative 1

Roadway Segment	Existing Noise Level[a]	Project-Related Increase	Buildout-Related Increase	Allowable Increase	Adverse Effect? Proj./Bldout
3rd St - North of Evans Ave	70	0.5	2.7	1	No/Yes
3rd St - Evans Ave to Palou Ave	70	0.2	2.6	1	No/Yes
3rd St - Palou Ave to Carroll Ave	70	0.3	2.7	1	No/Yes
3rd St - South of Carroll Ave	70	0.3	2.5	1	No/Yes
Evans Ave - 3rd St to Hunters Point Blvd	65	1.7	4.5	1	Yes/Yes
Palou Ave - 3rd St to Crisp Rd	65	1.6	2.7	1	Yes/Yes
Carroll Ave - 3rd St to Ingalls St	65	0.0	1.8	1	No/Yes
Innes Ave - Hunters Point Blvd to Donahue St	65	2.6	3.0	1	Yes/Yes
Donahue St - Innes Ave to Galvez Ave	60	5.0	5.4	2	Yes/Yes
Donahue St - Galvez Ave to Lockwood St	60	4.3	4.5	2	Yes/Yes
Galvez Ave - Donahue St to Robinson St	60	1.8	1.9	NA[b]	No
Lockwood St- Donahue St to Fischer Ave	60	2.5	2.6	NA	No
Crisp Rd - Palou Ave to Spear Ave	60	5.0	5.8	NA	No
Spear Ave - Crisp Rd to Morrell St	60	4.9	5.6	NA	No

Notes:

a. Existing noise levels estimated from ambient noise levels presented in Section 3.3.

b. NA – No noise sensitive land uses.

Sources: Appendix I3 of the CP-HPS DEIR (SFRA 2009); and Illingworth & Rodkin, Inc. 2010.

As indicated in Table 4.3.2-2, project-related traffic would cause a substantial increase in noise at residences along Donahue St, Palou Ave, and the Innes Ave/Evans Ave corridor. Buildout would also cause a substantial noise increase along 3rd Street. This increment is large enough to exceed the factor for a "substantial permanent increase" in traffic noise in residential areas. **Mitigation 4 and 5** described above would be used to address significant traffic noise increases in these residential areas. However, while they are readily applicable to new construction, their applicability to existing structures may be limited. Also, the construction of continuous noise barriers at curbside along the entire length of the identified roadways would not be feasible because it would preclude residents' main vehicular access route to their homes, and would conflict with the aesthetic character of the BVHP neighborhood by placing walls or solid fences in front of front yards. While exterior noise levels would exceed the significance factors established in this SEIS, in order to reduce human annoyance at existing residences from permanent increases in ambient noise levels, acoustical testing and retrofitting the interior of existing structures would minimize the potential for interior noise levels to exceed 45 dBA.

Ultimately, however, the feasibility and implementation of the noise insulation measures that would be required to reduce interior noise levels in existing structures to 45 dBA would depend on factors that are beyond the control of the city as the lead agency or the future developer or owner of the property. Further, it is unknown whether the proper attenuation would be achievable at every impacted property. While sound rated windows would serve to reduce interior noise levels, this may not be sufficient to reduce noise levels due to the age of some structures. Additionally, for any structures that lack air conditioning or other internal cooling mechanisms, open windows typically provide the main source of ventilation and cooling. Therefore, the residents would be required to choose between open windows for ventilation or closed windows for sound attenuation. In some cases, the structure may need to be entirely rebuilt in order to achieve the proper attenuation level. Therefore, since measures to reduce this impact may be considered infeasible, these impacts would be *significant and unavoidable*. However, future increases with the project would not result in a 24-hour community noise level above an estimated 70 dBA L_{dn} at existing residences and, while exceeding the criteria, these levels would still be within the range typical of an urban environment.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, but impacts would remain *significant and unavoidable*.

4.3.2.2.4 Factor 7: Exposure to Excessive Event Noise Levels

Although a football stadium exists at Candlestick Point, this analysis recognizes that the proposed new location on HPS could result in noise impacts on different and new receptors. This impact analysis is based on the findings presented in the *CP-HPS DEIR San Francisco 49ers Stadium Operational Noise Study, Appendix I1* (SFRA 2009).

There are two general sources of noise during football games/concerts in the stadium that could produce noise that affects the surrounding community:

- Game spectators/concert audience; and
- Amplified speech and music broadcast over the stadium/concert sound system.

There would also be event day changes to the traffic flows, with consequent changes in traffic noise levels and patterns in the community. However, the traffic noise levels in the community during a game or concert day were not modeled for the following reasons:

- Percentage of game/concert attendees using local transit service and the site's improved connectivity to regional transit service are expected to increase from 19 percent under existing conditions to 25 percent;
- Levels of background traffic (i.e., motor vehicle use by local residents and others non-game attendees) using local streets would be suppressed due to avoidance of the area during a game/concert day; and
- Since game/concert traffic would be temporally concentrated during the few hours before and after such events, such congestion would reduce the average traffic speeds with consequent lowering of traffic noise.

Thus, the traffic noise levels presented above in Table 4.3.2-2 (for a non-event weekday) could be considered upper bounds for the location and degree of traffic noise impacts on an event day.

Unlike noise in the existing residential neighborhoods surrounding the stadium site, which is typically dominated by transportation sources that are predictable day-to-day and year-to-year, game/concert noise would occur on only a few days per year and would last only a few hours on those days, although it would be much louder than the current background noise in the immediate vicinity of the stadium than on non-game and non-concert days. For the purposes of this SEIS, and as stated under the Significance Criteria for this section, an increase in community noise to levels exceeding 65 L_{dn} at a noise-sensitive receptor, or an L_{max} increase above 75 dBA at a noise-sensitive receptor, would be considered a significant impact.

Noise intensity during games/concerts, its variation over time, and the duration of games/concerts are important for determining noise impacts. A 3-D computer noise model was applied using SoundPLAN® to estimate game/concert noise levels in the surrounding community. As shown in Figure 4.3.2-1, the model receivers (i.e., R1 through R6) were located at representative locations in the potentially affected existing residential areas near the project site, which are the same locations as the long-term noise monitoring sites (i.e., N1 through N6). The following new receivers were added to the noise model:

- R7 on Coleman St at the proposed action's new residential development closest to the stadium (mixed use at the HPS Village Center district);
- R8 at the closest point to the proposed action's HPS Residential Density III area (HPS North district);
- R9 on Palou Ave and Lane St in the BVHP neighborhood; and
- R10 on Bayview Circle near Newhall St in the BVHP neighborhood.

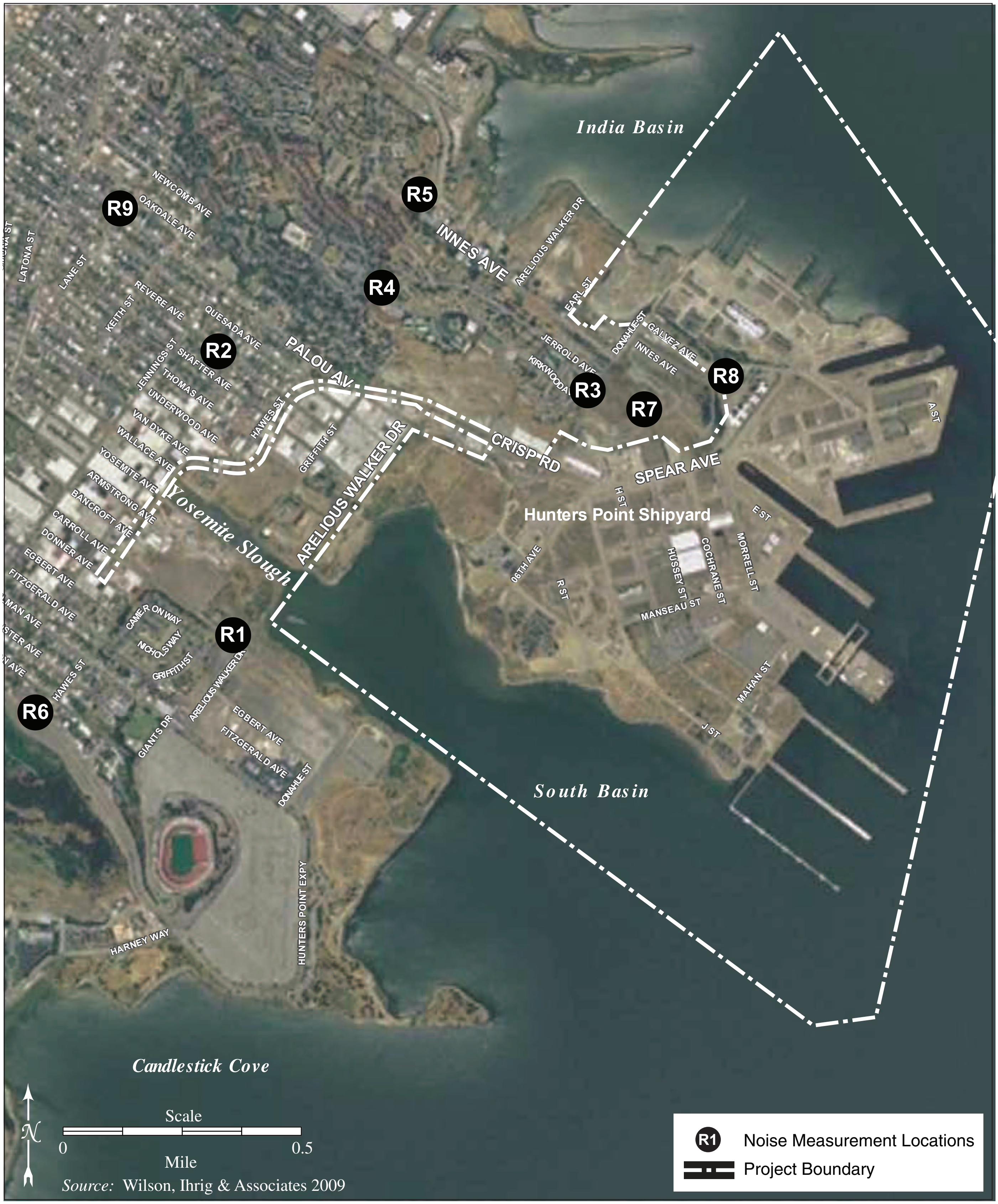


Figure 4.3.2-1. Event Receiver Locations

Wind effects can increase noise levels downwind of a noise source, while reducing noise levels upwind. The prevailing winds for the project site originate from the west, northwest, or west-northwest directions, which would be acoustically favorable for neighborhood receivers, and could reduce noise levels from the stadium as they would "carry" the noise over the San Francisco Bay. However, "no wind" conditions were chosen for modeling purposes to produce worst-case noise levels in the surrounding neighborhood.

Temperature inversions can cause increased noise levels at distant receivers. A temperature inversion is a layer of warmer air over a cooler layer (that is, a reversal of the normal atmospheric temperature gradient where temperature decreases with increasing height above the ground). The interface between the two layers may reflect sound waves and increase ground level noise. However, temperature inversion effects are difficult to model accurately and consequently were not included in SoundPLAN® for this study.

Modeling of Crowd and Public Address System Noise Levels

Potential noise impacts associated with noise from the crowd and the stadium's sound system were evaluated for a typical full-capacity football game. Projections assume a typical game is on the order of three hours with crowd and/or public address system (PA) noise sustained at typical maximum levels for an aggregate 45 minutes over the 3-hour period.

For each noise source, estimates were made for typical maximum noise levels (L_{max}) and the day night level (L_{dn}) for a typical game day. The game day L_{dn} calculations were based on a noise energy summation of the existing ambient hourly L_{eq} noise levels at each location (i.e., as measured or extrapolated from measured data) and the projected game noise levels at that location. The L_{dn} calculations assumed that typical games would be during evening hours and would not continue past 10:00 P.M., which could substantially affect the L_{dn}, as this noise scale is adjusted to account for some individuals' increased sensitivity to noise levels during the evening and nighttime hours. Thus, game delays or other reasons for game operations continuing past 10:00 P.M. would increase the potential for noise impacts.

Table 4.3.2-3, representing no wind conditions, presents the modeling results for combined crowd noise and PA system noise. The combined noise levels are slightly higher than the larger of the crowd or PA noise level components, but present a more conservative estimate, which would vary at each receiver location. The locations of the model receivers are illustrated by Figure 4.3.2-1.

Table 4.3.2-3. Predicted Crowd and PA Combined Noise Levels (No Wind Condition)

Model Receiver	*Distance from proposed Stadium(miles)*[a]	*L_{max} (dBA)*[b]	*Game Day L_{dn}*[c]	*L_{dn} Increase over Existing*[d]	*Proposed Criteria Exceeded*
R1	1.0	61	63 to 67	<1 dBA	None
R2	1.0	64	63 to 65	<1 dBA	None
R3	0.3	**76**	**62 to 65**	**3 to 4 dBA**	**65 L_{dn}, 75 dBA L_{max}**
R4	0.7	66	65 to 66	<1 dBA	None
R5	0.9	62	62 to 65	<1 dBA	None
R6	1.4	58	59 to 60	<1 dBA	None
R7	0.2	**83**	**69**	**7 to 9 dBA**	**65 L_{dn}, 75 dBA L_{max}**
R8	0.3	**78**	**64 to 66**	**4 to 6 dBA**	**65 L_{dn}, 75 dBA L_{max}**
R9	1.3	55	63 to 65	<1 dBA	None
R10	1.6	57	65 to 66	<1 dBA	None

Notes:

a. Approximate distance to center of stadium.
b. L_{max} was estimated by SoundPLAN® and represents anticipated typical maximum noise levels expected during football games.
c. Based on noise energy summation of measured or assumed ambient plus SoundPLAN® predicted game noise levels.
d. Relative to representative ambient data.

Source: Appendix I1 of the CP-HPS DEIR (SFRA 2009).

The modeled noise impacts would exceed criteria at:

- R3, which is representative of the existing Hunters Point Hill residential neighborhood closest to the stadium. Here combined noise sources would increase the existing L_{dn} by 3 to 4 dBA, to a resultant L_{dn} as high as 65 dBA, while game-day maximum noise levels could be as high as 75 dBA. Thus, there is the potential to equal the L_{dn} impact criterion of 65 dBA and exceed the L_{max} criterion of 75 dBA at this location.
- R7. is representative of the new residential development located in Hunters Point Phase I closest to the stadium (but not part of the project). Here, combined noise sources would increase the existing L_{dn} by 7 to 9 dBA, to a resultant L_{dn} as high as 69 dBA, while game-day maximum noise levels could be as high as 83 dBA. Thus, there is the potential to exceed both the L_{dn} and L_{max} criteria at this location.
- R8, is representative of new project residential use in the HPS North district, closest to the stadium. Here, combined noise sources would increase the existing L_{dn} by 4 to 6 dBA, to a resultant L_{dn} as high as 66 dBA, while game-day maximum noise levels could be as high as 78 dBA. Thus, there is the potential to exceed both the L_{dn} and L_{max} criteria at this location.

In general, potential football game noise impacts would be limited to areas near (i.e., within about 3,300 ft. (990 m) the stadium. In more distant areas, it is not likely that game noise levels would exceed the 65 dBA L_{dn} or the 75 dBA L_{max} noise impact criteria. However, for the existing residential uses closest to the proposed stadium (as characterized by Receiver R3) and possibly for the new residential uses closest to the proposed stadium (as characterized by Receivers R7 and R8) there would be noise impacts during football game days.

Although game noise would not exceed the above-mentioned criteria outside a 3,300-ft (990 m) radius from the stadium, there would be a potential for audibility at greater distances from noise generated during football games when background ambient noise in the neighborhoods is low (i.e., whenever the A-weighted game noise level is equal to or greater than the A-weighted community background noise level, L90). However, audibility alone is not sufficient for a finding of significance. Candlestick Park is currently used for football games. Noise from football games is audible over a wide area that would largely overlap with the area of audibility of football games played at the proposed stadium. Consequently, football game noise is already part of the existing ambient condition in the residential neighborhoods north and west of the project site.

Nevertheless, the potential for football game noise to be easily detectable both outdoors and indoors was modeled and the results are shown in Table 4.3.2-4. Crowd noise that is less than the background L90 would be masked at least 90 percent of the time, while crowd noise that exceeds the L10 would be easily detectable at least 90 percent of the time. Crowd noise would be easily detectable outdoors at times at distances up to about 1.6 miles from the stadium. Also, game L_{max} would exceed ambient background levels (i.e., L90) at all modeled receivers by 8 dBA or more at all modeled receivers; this would equal or exceed the 8 dBA noise limit set by the San Francisco Noise Ordinance (Section 2909b). As for interior effects, assuming a 15 dBA nominal exterior-to-interior noise reduction provided by the building shell, which is typical for single family homes without special acoustical mitigation, maximum game noise levels would be audible indoors at times at Receivers R1, R2, R4, and R5. The model receiver locations are shown in Figure 4.3.2-1.

Table 4.3.2-4. Audibility of Game Noise at Model Receivers								
Model Receiver	**Distance from Stadium (miles)**	**Exterior Ambient L_{10} (dBA)[a]**	**Exterior Ambient L_{50} (dBA)[a]**	**Exterior Ambient L_{90} (dBA)[a]**	**Exterior Game L_{max}**	**Detectable Outdoors?**	**Interior Game L_{max} (dBA)**	**Detectable Indoors? (>45 dBA)[b]**
R1	1.0	52 to 55	44 to 48	42 to 45	61	At least 22.5% of the time	46	**Yes**
R2	1.0	60 to 64	48 to 53	45 to 47	64	At least 12.5% of the time	49	**Yes**
R4	0.7	60 to 63	48 to 52	44 to 46	66	At least 12.5% of the time	51	**Yes**
R5	0.9	61 to 63	47 to 50	43 to 44	62	At least 12.5% of the time	47	**Yes**
R6	1.4	58 to 62	49 to 50	45 to 46	58	At least 12.5% of the time	43	No
R9	1.3	60 to 64	48 to 53	45 to 47	55	At least 2.5% of the time	40	No
R10	1.6	60 to 63	48 to 52	44 to 46	57	At least 2.5% of the time	42	No

Notes:

a. Ranges of "Exterior Ambient" for L10, L50 and L90 are representative of afternoon or evening hours when games are most likely to occur.

b. Judgment of "Detectability" is based on comparisons of game L_{max} with an assumed indoor ambient background noise level of 45 dBA.

Source: Appendix I1 of the CP-HPS DEIR (SFRA 2009).

Modeling of Concert Noise Levels

The proposed stadium may be used occasionally as a venue for music concerts. The sound system used for such a concert would not be the one permanently installed at the proposed stadium, but one specifically designed for and temporarily installed by each touring band.

The typical configuration during concerts would likely have the stage in the end zone for large events or at the 50-yard line for smaller shows. The noise impacts associated with large events were analyzed, since this represents a worst-case condition for concert noise levels. Although the stage could be located at either end of the field (north or south), it was assumed the stage would be at the northern end of the field pointing south. In this way, most of the sound would be projected towards the bay and away from residences.

Noise levels from a music concert would fluctuate greatly depending on the type of music being performed (e.g., rock, pop, hip-hop, etc.) and on the performers' preferred style and loudness. The latter affects the sound power settings used for the event. The loudness is also related to the size of the venue and to some degree the size of the audience. To address the variable range of music genre possible, recorded music samples were used to obtain sound spectra for rock and hip-hop music as two different styles of music that might use the stadium as a concert venue. Other styles of music would generally be less percussive and, therefore, presumably have less of an impact on the surrounding community.

Table 4.3.2-5 presents the modeling results for concert noise. Unless mitigations were implemented for the existing residential uses closest to the proposed stadium (as characterized by Receiver R3) and possibly for the new residential uses closest to the proposed stadium (as characterized by Receivers R7 and R8), there would be a potential for project-induced concert noise impacts.

As with football game noise, there would also be a potential for outdoor audibility of concert noise at all receivers modeled, and for indoor audibility at distances up to 1.0 mile from the stadium. Also, game L_{max} would exceed both A-weighted and C-weighted ambient background levels at all modeled receivers by at least 8 dBA or 8 dBC, respectively; this would equal or exceed the noise limits set by the San Francisco Noise Ordinance (Section 2909b).

Table 4.3.2-5. Predicted Concert Sound System Noise Levels

Model Receiver	Distance (miles)	L_{max} (dBA)	L_{max} (dBC)	Concert L_{dn} (dBA)	L_{dn} Increase over existing(dBA)	Proposed Criteria Exceeded
R1	1.0	57	78	63 to 67	< 1 dBA	None
R2	1.0	63	83	64 to 65	<1 to 1 dBA	None
R3	0.3	72	92	63 to 65	**3 to 5 dBA**	**65 L_{dn}**
R4	0.7	64	84	65 to 67	< 1 to 1 dBA	None
R5	0.9	63	82	62 to 65	< 1 dBA	None
R6	1.4	56	76	59 to 60	< 1 dBA	None
R7	0.2	75	95	65 to 67	**5 to 7 dBA**	**65 L_{dn}**
R8	0.3	63	83	59 to 63	1 dBA	None
R9	1.3	56	76	63 to 65	< 1 dBA	None
R10	1.6	58	78	65 to 66	< 1 dBA	None

Source: Appendix I1 of the CP-HPS DEIR (SFRA 2009).

Mitigation Measures

Mitigation 6. Mitigation to minimize game/concert-related temporary increases in ambient noise levels at nearby residences.

To provide that stadium game- and event-induced interior L_{max} noise levels do not exceed an interior noise level of 60 dBA and interfere with speech and other indoor activities in the existing Hunters Point Hill residential community closest to and north of the stadium (i.e., as identified by the R3 stadium noise model receiver), the Stadium Operator would:

- After project approval, send notification of the establishment of a stadium noise mitigation program to the residential property owners in the identified neighborhood potentially affected by noise from the proposed stadium.
- Allow property owners an appropriate time after the date of notification about the stadium noise mitigation program to apply for the program, with a reminder sent to the owners before the end of the application period.
- Determine if responding property owners meet qualifications regarding location and exposure to event noise.
- Compile for property-owners' reference and send to them a summary of standard types of structural acoustical mitigations.

- Choose a qualified acoustical consultant to survey the potentially affected residential units and recommend sound reduction measures appropriate to offset the modeled stadium noise impacts, which may include:
    - Acoustical upgrades to windows and doors,
    - Acoustical stripping around doors and other openings, and
    - Ventilation improvements.
- Estimate the cost of recommended sound reduction measures, which would include labor and materials, permit fees, and city inspections; material costs would, as much as possible, be based on "like-for-like", that is, for replacement of existing materials similar in quality or appearance.
- Pay each qualifying property owner the amount of this estimate after obtaining a release from future claims for stadium event noise impacts at each property with each property owner responsible for implementing the sound reduction improvements.
- Establish an ad hoc community working group of neighbors to develop a mediation process should any future disputes arise over the effectiveness of the stadium noise mitigation program in eliminating stadium noise intrusions.

Implementation of this mitigation identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the future operator of the stadium. The mitigation would need to be implemented after the stadium operator enters into a lease agreement with the City and County of San Francisco. The City and County of San Francisco would enforce the mitigation. Monitoring for compliance would be the responsibility of the City and County of San Francisco in conjunction with an ad hoc community working group. The City and County of San Francisco would review and approve the implementation of the program via annual reports to the City and County of San Francisco demonstrating compliance and verify complete compliance once the program is completely implemented.

Mitigation 7. Residential use plan review by qualified acoustical consultant.

To provide that stadium game and event-induced interior L_{max} noise levels do not exceed an interior noise level of 60 dBA and interfere with speech and other indoor activities in the proposed onsite residential uses closest to the stadium, the Stadium Operator would choose a qualified acoustical consultant to review plans for the new residential uses planned for areas closest to the proposed stadium and follow their recommendations to provide acoustic insulation or other equivalent measures to ensure that interior peak noise events would not exceed 60 dBA L_{max}.

Implementation of this mitigation identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]) would be the responsibility of the future developer or owner of the property. The mitigation would be approved during design review of the lot application. The City and County of San Francisco and DBI would enforce the mitigation and monitoring for compliance. The City and County of San Francisco and DBI would review and approve all design documents in the future.

Unless mitigations were implemented for the residential uses that would be impacted as represented by modeling locations R3 and R7, there would be a potential for significant stadium-induced noise impacts during football games and concerts at this location. Implementation of **Mitigation 6** would ensure that these residential uses do not experience game/concert-related transient increases in ambient noise levels within their homes that would exceed 60 dBA L_{max}. **Mitigation 7** would be implemented for new residential uses associated with the HPS site located in proximity of the proposed stadium. Implementation of **Mitigation 7** would ensure that new residential uses at the HPS site would not experience noise levels associated with the Stadium uses that would interfere with regular interior activities, including speech and sleep.

Ultimately, however, the feasibility and implementation of the noise insulation measures recommended under **Mitigation 6** would depend on factors that would be beyond the control of the city as the lead agency, or the future developer or owner of the property. Implementation of **Mitigation 6** would require access to all potentially affected residential units at the identified location outside of the project site, performance of noise measurements and other tests within these private residential units, installation of structural noise attenuation features, and verification of the effectiveness of the installed noise attenuation features during football games and concerts at the proposed stadium. Further, installation of such noise attenuation features may not be practicable or possible at all locations due to the age and integrity of the residential structures as noted under impact Factor 6. Therefore, as the ultimate feasibility and practicality of **Mitigation 6** cannot be guaranteed at this time, noise impacts from football games and concerts this impact would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, but impacts would be *significant and unavoidable*.

4.3.2.2.5 Factor 8: Exposure to Excessive Aircraft Noise Levels

The project would not expose people living or working on site to excessive noise from commercial aircraft overflights associated with San Francisco International Airport operations. As shown on Figure 4.3.2-2, the project site is well outside the airport's existing 65 dBA CNEL contour, and for the foreseeable future, it is expected to remain outside this contour, which the FAA regards as an impact threshold for noise-sensitive land uses (i.e., residential). Although the project site is under some of the main aircraft approach and departure tracks, these flights all pass over the site at considerable altitude. The typical SEL associated with such overflights (as observed during the football game noise measurements conducted at Candlestick Park) would be in the low 70s dBA. Given the 20 to 30 dBA of acoustic insulation that would be typical for the new residential uses that would be built as part of the project, the expected daily/nightly sleep disturbance probability in the residential interiors would be very low, even with the relatively large number of daily flight operations typical for the airport. Additionally, a review of Airport Director's Reports from the past six months indicates that no complaints were received from BVHP neighborhood residents regarding aircraft noise. Therefore, potential impacts would *not be significant,* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D would not cause substantial changes in noise, and impacts would *not be significant.*

4.3.3 Alternative 1A: Stadium Plan/No-Bridge Alternative

Under Alternative 1A, a new stadium would be constructed and approximately 2,650 housing units would be developed within the project site. Like Alternative 1, 7,255 new jobs would result. The number of construction personnel required at any given time would be similar to the total project for Alternative 1. However, the Yosemite Slough bridge would not be constructed. Alternative 1A includes a variant that would increase the footprint of Tower D by a small amount, if constructed. This alternative would meet most of the project objectives (Section 1.1, Purpose and Need for Action), but to a lesser extent than Alternative 1 for transportation-related objectives because it would not include the Yosemite Slough bridge. In all other relevant respects, Alternative 1A would be the same as Alternative 1 for housing, R&D, retail, recreation and open space, etc.

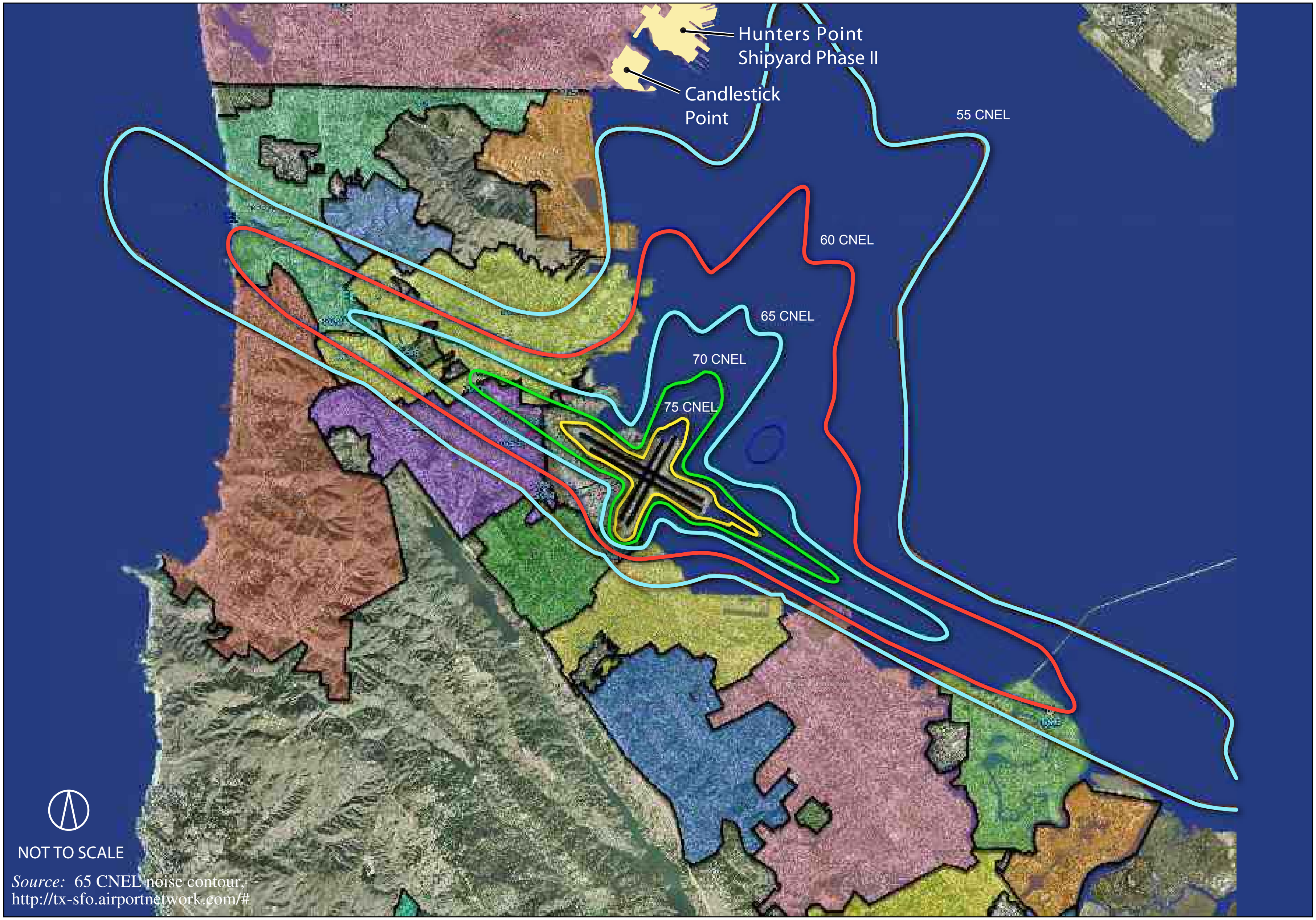


Figure 4.3.2-2. San Francisco International Airport Noise Contours

4.3.3.1 Construction Impacts

New development would begin with construction of the football stadium, scheduled for completion in 2019. HPS North district residential development would begin during 2011–2015 and is planned for completion by 2019. Build-out of the R&D district is planned by 2027. The mixed-use, neighborhood retail, and residential development at the HPS Village Center district would be completed in 2023. This alternative includes a variant that would increase the footprint of Tower D by a small amount. While this would make a minor difference to construction noise generation related to tower construction, it would not alter the impact analyses for construction in the next sections.

4.3.3.1.1 Factor 1: Exposure to Excessive Construction Noise Levels

Construction Impacts at Offsite Noise-Sensitive Receptors

Offsite roadway improvements to Innes Avenue for Alternative 1A would result in the same impacts as are associated with Alternative 1. Equipment noise levels are listed in Table 4.3.2-1. Construction of the proposed football stadium would require pile-driving activities, which would produce noise levels of 101 dBA at 50 ft (15 m) from the source. The greatest construction noise levels (during pile driving activities) associated with construction of the stadium would be 77 dBA to 83 dBA, depending on the distance from the noise generating activity. All offsite construction activities would be required to comply with Sections 2907 and 2908 of the Noise Ordinance and to implement mitigation (**Mitigations 1 and 2**). Compliance with the Noise Ordinance and the identified mitigations would reduce the magnitude of construction noise to offsite receptors from construction, and *residual* noise impacts would *not be significant.*

Construction Impacts at Future Onsite Noise-Sensitive Receptors

As is the case with Alternative 1, and based on the construction schedule, construction activities associated with the stadium, HPS North district, and R&D district would not impact onsite future noise-sensitive uses. However, construction of the HPS Village Center district would occur while the HPS North district residential uses are occupied (i.e., after the residential construction is complete and new residents have moved in) and, therefore, could potentially impact the HPS North district residential uses. Noise levels from pile driving activities could be as high as 101 dBA for the residential uses within the HPS North district.

Construction would comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. Further, the Noise Ordinance would limit noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 ft (30 m) unless the construction activity occurred during allowable hours. Additionally, **Mitigations 1 and 2** would be implemented to reduce noise during construction. Finally, since construction activities would only occur during the hours specified under Sections 2907 and 2908 of the Noise Ordinance, noise from project construction would not violate any city codes or other requirements placed on construction activity by the city or agency. Therefore, *residual* impacts would *not be significant* assuming compliance with the Noise Ordinance and implementation of the mitigation.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, and *residual* impacts would *not be significant* with implementation of mitigation.

4.3.3.1.2 Factor 2: Exposure to Excessive Construction Vibration Levels

Construction Impacts of Vibration at Offsite Vibration-Sensitive Receptors

As for Alternative 1, offsite roadway improvements for Alternative 1A would result in construction activities occurring within 25 ft (8 m) of existing residential uses along Innes Ave. The estimated groundborne vibration levels occurring during offsite roadway improvements would be 86 VdB (vibration from loaded trucks). Construction of offsite roadway improvements would not expose sensitive receptors off site to excessive groundborne vibration or groundborne noise levels. Therefore, impacts would *not be significant*, and no mitigation is proposed.

Construction of the proposed football stadium would require pile driving. As for Alternative 1, stadium construction impacts of vibration at offsite sensitive receptors for Alternative 1A would *not be significant* and no mitigation is proposed.

Construction Impacts of Vibration at Future Onsite Vibration-Sensitive Receptors

Construction of the residential and commercial uses in the HPS Village Center would utilize pile drivers. Vibration levels from pile driving activities could be as high as 103 VdB for the residential uses within the HPS North district. This would exceed the FTA's 80 VdB threshold for residential uses for infrequent events.

Implementation of **Mitigations 1, 2, and 3** would reduce the impacts associated with vibration levels. However, pile-driving and excavation activities would occur intermittently throughout the 18-year construction phasing. This increase in vibration levels would be noticeable and would likely cause human annoyance. Therefore, while implementation of the above-mentioned mitigation would reduce the vibration levels associated with the construction activities noted, the temporary residual construction-related increases in vibration levels would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional vibration, but residual impacts would remain *significant and unavoidable*.

4.3.3.1.3 Factor 3: Increases in Ambient Noise Levels from Construction

Construction activities would involve the use of heavy equipment (e.g., Table 4.3.2-1) and pile driving would be required for development of the residential towers in the HPS North district, with noise levels of up to 101 dBA at a distance of 50 ft (15 m). Further, estimated noise levels experienced by adjacent noise-sensitive uses due to construction activities associated with offsite roadway improvements (conservatively assumed to be 25 ft (8 m) from the proposed improvement activity), would be 91 dBA during the loudest offsite activities.

Implementation of **Mitigations 1, 2, and 3** would reduce the impacts associated with ambient noise levels. However, pile-driving and excavation activities would occur intermittently throughout the 18-year construction phasing. This increase in ambient noise levels would be noticeable and would likely cause human annoyance. Therefore, while implementation of the above-mentioned mitigation would reduce the noise levels associated with the loudest construction activities noted, temporary residual construction-related increases in ambient noise levels would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, but impacts would remain *significant and unavoidable*.

4.3.3.2 Operational Impacts

4.3.3.2.1 Factor 4: Exposure to Excessive Noise Levels

Alternative 1A would include the same development of new commercial, retail, and residential uses as Alternative 1. Noise levels from these activities would be similar throughout the project site with average noise levels ranging between 60 and 70 dBA. Residences would be exposed to exterior noise levels exceeding 60 dBA L_{dn} with interior noise levels exceeding 45 dBA L_{dn}. Implementation of **Mitigations 4 and 5** would reduce the noise levels.

Large-scale HVAC systems would be installed for the new residential, retail, and commercial buildings. HVAC equipment would not be anticipated to produce noise levels more than 5 dBA above the ambient noise level, which is the threshold under Municipal Code Section 2909(a).

Daily operation of the project such as loading dock activity, regional retail and other commercial activities would generate noise levels that are comparable to a typical urban environment. Mechanical systems, daily deliveries, and trash collection would not result in increases of 5 dBA over the anticipated ambient noise level. Since the daily operational activity would not exceed the noise standards established by the Municipal Code, with implementation of **Mitigations 4 and 5**, *residual* noise impacts would *not be significant.*

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, and *residual* impacts would *not be significant* with implementation of **Mitigations 4 and 5**.

4.3.3.2.2 Factor 5: Exposure to Excessive Vibration Levels

Typical background vibration levels in inhabited areas are about 50 VdB. Such vibration background levels would be expected generally on the project site after the completion of all construction activities. These levels would be substantially less than the FTA's vibration impact threshold of 80 VdB for human annoyance. No substantial sources of future operational groundborne vibration would be built as part of the project. Therefore, operation of the project would not expose sensitive receptors on site or off site to excessive groundborne vibration or groundborne noise levels and impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D would not cause substantial changes in noise, and impacts would *not be significant.*

4.3.3.2.3 Factor 6: Exposure to Increased Traffic Noise Levels

The increase in traffic resulting from implementation of the project and ambient growth over the next 20 years under Alternative 1A would be the same as for Alternative 1. Table 4.3.2-2 identifies the changes in future noise levels along the study area roadway segments that have residential uses. As indicated, Alternative 1A - related traffic would cause a substantial increase in noise at residences along Donahue St, Palou Ave, and the Innes Ave/Evans Ave corridor. Buildout would also cause a substantial noise increase along 3rd St. This increment is large enough to exceed the adopted factor for a "substantial permanent increase" in traffic noise in residential areas. **Mitigations 4 and 5** would address traffic noise increases in these residential areas. However, construction of continuous noise barriers at curbside along the entire length of the identified roadways would not be feasible. While exterior noise levels would exceed the thresholds, acoustical testing and retrofitting the interior of existing structures would minimize the potential for interior noise levels to exceed 45 dBA. Therefore, measures to reduce this impact may be considered infeasible in some cases, and these impacts would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, but impacts would remain *significant and unavoidable.*

4.3.3.2.4 Factor 7: Exposure to Excessive Event Noise Levels

Noise intensity during games/concerts, its variation over time, and the duration of games/concerts under Alternative 1A would be the same as described for Alternative 1.

Table 4.3.2-2 presents the modeling results for combined crowd noise and PA system noise. The locations of the model receivers are illustrated in Figure 4.3.2-1. The modeled noise impacts would exceed criteria at the existing Hunters Point Hill residential neighborhood closest to the stadium, new residential development located in Hunters Point Phase I closest to the stadium (but not part of the project), and new project residential use in the HPS North district, closest to the stadium. In general, potential football game noise impacts would be limited to areas near the stadium (i.e., within about 3,300 ft (990 m) from the stadium). Nevertheless, the potential for football game noise to be easily detectable both outdoors and indoors was modeled, and the results are shown above in Table 4.3.2-4.

Table 4.3.2-5 above presents the modeling results for concert noise. Unless mitigations were implemented for the existing residential uses closest to the stadium (as characterized by Receiver R3) and possibly for the new residential uses closest to the stadium (as characterized by Receivers R7 and R8), there would be a potential for significant project-induced concert noise impacts. As with football game noise, there would also be a potential for outdoor audibility of concert noise at all receivers modeled, and for indoor audibility at distances up to 1.0 mile from the stadium. Also, game L_{max} would exceed both A-weighted and C-weighted ambient background levels at all modeled receivers by at least 8 dBA or 8 dBC, respectively; this would equal or exceed the noise limits set by the San Francisco Noise Ordinance (Section 2909b).

There would be a potential for significant stadium induced noise impacts during football games and concerts at modeling locations R3 and R7 unless mitigation was implemented for the residential uses that would be impacted. Implementation of **Mitigation 6** would ensure that these residential uses do not experience game/concert-related transient increases in ambient noise levels within their homes that would exceed 60 dBA L_{max}, provided that retrofitting the existing residence is feasible. **Mitigation 7** would be implemented for new residential uses associated with the HPS site located in proximity of the proposed stadium. Implementation of **Mitigation 7** would ensure that new residential uses at the HPS site would not experience noise levels associated with the stadium uses that would interfere with regular interior activities, including speech and sleep. However, since the ultimate feasibility and practicality of **Mitigation 6** cannot be confirmed at this time, noise impacts from football games and concerts would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D would not cause substantial additional noise, but impacts would remain *significant and unavoidable.*

4.3.3.2.5 Factor 8: Exposure to Excessive Aircraft Noise Levels

Alternative 1A would not expose people living or working on site to excessive noise from commercial aircraft overflights associated with SFO operations, and impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D would not cause substantial changes in noise, and impacts would *not be significant*.

4.3.4 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

Under the Non-Stadium Plan/Additional R&D Alternative, a new stadium would not be constructed and, instead, additional R&D uses emphasizing emerging technologies would be developed at HPS. The following differences with respect to Alternative 1 have a bearing on the potential for noise impacts. Alterative 2 would generate 13,159 new jobs (Economic & Planning Systems 2009) as compared to 7,255 for Alternative 1. The number of construction personnel required at any given time would be similar to the total project for Alternative 1. An additional 2.5 million square ft (232,500 m^2) of R&D uses would be developed within the HPS South district in lieu of a stadium. Total R&D uses under Alterative 2 would be 5 million square ft (465,000 m^2) compared to 2.5 million under Alternative 1. Parking to serve game-day patrons proposed for the R&D development site north of Crisp Road would not be required.

Alternative 2 would include the same new parks and open space facilities as proposed under Alternative 1. The sports field complex would comprise a smaller area (55.6 ac versus 84.2 ac) than proposed under Alternative 1. A new Yosemite Slough bridge that would serve only transit, bike, and pedestrian traffic would extend Arelious Walker Dr from Candlestick Point to HPS. The four auto lanes on the bridge for game-day traffic under Alternative 1 would not be included in Alternative 2. The bridge would be approximately 40-ft (12 m) wide and would cross the slough at the same location as Alternative 1. The bridge and its approach streets would have two dedicated transit lanes and a separate Class I bicycle and pedestrian lane, which would be open at all times. At HPS, additional roadways to serve the R&D uses on HPS South would be included and commercial parking would be increased to serve the additional R&D space.

4.3.4.1 Construction Impacts

In general, although the timing would be somewhat different, the overall construction activity for Alternative 2 would be similar to that for Alternative 1. Alternative 2 development would not involve the construction of the stadium. The location of the stadium would be filled by expanded R&D space. HPS North district residential development would begin during 2012 - 2017, and is planned for completion by 2019. Build-out of the R&D district is planned by 2027. The mixed-use, neighborhood retail and residential development at the HPS Village Center district would be completed in 2023. The overall construction noise impacts of this alternative are expected to be essentially the same as those identified for Alternative 1. While the stadium would not be built, and pile driving may not be required in that location, the R&D construction would occur in the same location with largely the same noise effects. This alternative includes a variant that would increase the footprint of Tower Variant D by a small amount. While this would make a minor difference to construction noise generation related to tower construction, it would not alter the impact analyses for construction.

4.3.4.1.1 Factor 1: Exposure to Excessive Construction Noise Levels

Construction Impacts at Offsite Noise-Sensitive Receptors

Offsite roadway improvements to Innes Avenue for Alternative 2 would result in construction activities occurring within 25 ft (8 m) of residential uses along the avenue. Noise levels associated with these offsite roadway improvements would be 85 dBA at 50 ft (15 m). At 25 ft (8 m), which is a halving of distance, noise levels would increase by 6 dBA, which would result in a noise level of 91 dBA due to grading activities.

All offsite construction activities associated with Alternative 2 would be required to comply with Sections 2907 and 2908 of the Noise Ordinance, and to implement mitigation (**Mitigations 1 and 2** described above). Compliance with the Noise Ordinance and implementation of the identified mitigations would reduce to *not significant* the *residual* impacts of construction noise to offsite receptors from construction-related noise associated with HPS.

Construction Impacts at Future Onsite Noise-Sensitive Receptors

Construction of the HPS Village Center district for Alternative 2 would occur while the HPS North district residential uses are occupied (i.e., after residential construction is complete and new residents have moved in) and, therefore, could potentially impact HPS North district residential uses. Construction of the residential and commercial uses in the HPS Village Center district would include the two high-rise towers that would require construction of deep foundations using pile drivers. The HPS Village Center district would be located within 50 ft (15 m) of the HPS North district residential uses. Noise levels from pile driving activities could be as high as 107 dBA for the residential uses within the HPS North district (assuming a distance of 25 ft (8 m). Other construction activities such as grading, excavation, paving, and structural finishes would be anticipated to produce noise levels of up to 89 dBA.

Pile driving activities would also be required for the shoreline improvements for Alternative 2; however, no noise-sensitive human uses are located within 500 ft (150 m) of the shoreline improvement areas. Therefore, pile-driving activities associated with the shoreline improvements would not result in excessive noise levels for noise-sensitive human receptors. The conditions under which noise levels would be considered excessive during construction activities, such as excavation or pile driving, would only occur for the duration of the specified activity and would only impact receptors located within 150 ft (45 m) or closer of the noise producing activity. Once construction activity was completed, the associated noise would no longer be experienced.

Construction of Alternative 2 should comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. Further, the Noise Ordinance would limit noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 ft (30 m) unless the construction activity occurred during allowable hours. **Mitigations 1 and 2** would be implemented during construction of Alternative 2 to reduce noise levels. Further, since construction activities would only occur under the hours allowed under Sections 2907 and 2908 of the Noise Ordinance, noise from project construction would not violate any city codes or other requirements placed on construction activity by the city or agency. Compliance with the Noise Ordinance and implementation of **Mitigations 1 and 2** would reduce the *residual* impacts to offsite receptors from construction related noise to *not be significant*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, and *residual* impacts would *not be significant* with the implementation of **Mitigations 1 and 2**.

4.3.4.1.2 Factor 2: Exposure to Excessive Construction Vibration Levels

Construction Impacts of Vibration at Offsite Vibration-Sensitive Receptors

Offsite roadway improvements would result in construction activities occurring within 25 ft (8 m) of existing residential uses. Groundborne vibration generated by construction trucks would be consistent with the level of vibration from deliveries that are currently made along roadways in the project vicinity to nearby commercial uses as a result of ongoing commercial and industrial activities, and would not increase groundborne vibration above existing levels. Construction of offsite roadway improvements would not expose sensitive offsite receptors to excessive groundborne vibration or groundborne noise levels. Therefore, potential impacts would *not be significant* and no mitigation is proposed.

Construction Impacts of Vibration at Future Onsite Vibration-Sensitive Receptors

Construction of the residential and commercial uses in the HPS Village Center would include two high-rise towers that would require the construction of deep foundations using pile drivers. The HPS Village Center would be located within 50 ft (15 m) of the HPS North district residential uses. Groundborne vibration levels associated with offsite roadway improvements would be 86 VdB due to the vibration from loaded trucks and bulldozers for grading. This would exceed the FTA's 80 VdB threshold for residential uses for infrequent events.

Implementation of **Mitigations 1, 2, and 3** would reduce the impacts associated with vibration levels. However, pile-driving and excavation activities would occur intermittently throughout the 18-year construction phasing. This temporary increase in vibration levels would be noticeable and would likely cause human annoyance. Therefore, while implementation of the above-mentioned mitigation would reduce the vibration levels associated with the construction activities noted, temporary residual construction-related increases in vibration levels would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional vibration, but residual impacts would remain *significant and unavoidable*.

4.3.4.1.3 Factor 3: Increases in Ambient Noise Levels from Construction

Construction activities occurring at the project site and in the project vicinity for roadway and infrastructure improvements would involve demolition, grading, and excavation activities, followed by construction and external finishing of the proposed facilities and associated parking areas, as well as roadway and landscaping improvements. Pile driving would be required for development of the residential towers in the HPS North district, with noise levels of up to 101 dBA at a distance of 50 ft (15 m). Further, the approximate noise levels experienced by adjacent noise-sensitive uses due to construction activities occurring during offsite roadway improvements, which are conservatively assumed to be 25 ft (8 m) from the proposed improvement activity, would be 91 dBA during the loudest offsite activities.

Implementation of **Mitigations 1, 2, and 3** would reduce the impacts associated with ambient noise levels. However, pile-driving and excavation activities would occur intermittently throughout the 18-year construction phasing. This temporary increase in ambient noise levels would be noticeable and would likely cause human annoyance. Therefore, while implementation of the above-mentioned mitigations would reduce the noise levels associated with the loudest construction activities, residual construction related increases in ambient noise levels would remain *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, but residual impacts would remain *significant and unavoidable*.

4.3.4.2 Operational Impacts

While the stadium would not be constructed and, therefore, the mitigation required for stadium events would not be necessary, the overall operational noise impacts of Alternative 2 are expected to be essentially the same as those identified for Alternative 1.

4.3.4.2.1 Factor 4: Exposure of Persons to Excessive Noise Levels

Daily operations of new commercial, retail, and residential uses for Alternative 2 would be essentially the same as for Alternative 1. Upon build-out, the entire project site would have a daily noise environment of a typical urban area, with average noise levels ranging between 60 and 70 dBA. Residences would be exposed to exterior noise levels exceeding 60 dBA L_{dn} and interior noise levels exceeding 45 dBA L_{dn}.

Daily operation of Alternative 2 would generate noise levels that are comparable to a typical urban environment. As such, mechanical systems, daily deliveries, and trash collection would not result in increases of 5 dBA over the anticipated ambient noise level. Therefore, the daily operational activity would not exceed the noise standards established by the Municipal Code. **Mitigations 4 and 5** would reduce exterior and interior noise levels, and *residual* impacts with mitigation would *not be significant*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, and *residual* impacts with mitigation would *not be significant*.

4.3.4.2.2 Factor 5: Exposure to Excessive Vibration Levels

Typical background vibration levels in inhabited areas are about 50 VdB. Such vibration background levels would be expected generally on the project site after the completion of all project-related construction activities. This is substantially less than the FTA's vibration impact threshold of 80 VdB for human annoyance. These types of activities (e.g., truck deliveries) would be consistent with deliveries that are currently made along roadways in the project vicinity to nearby commercial uses, and onsite as a result of ongoing commercial and industrial operations, and would not increase groundborne vibration above existing levels. No substantial sources of groundborne vibration would be built as part of the project. Therefore, since operation of the project would not expose sensitive receptors onsite or offsite to excessive groundborne vibration or groundborne noise levels, potential impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option would not cause substantial changes in noise, and impacts would *not be significant*.

4.3.4.2.3 Factor 6: Exposure to Increased Traffic Noise Levels

The increase in traffic resulting from implementation of the project and growth over the next 20 years would increase the ambient noise levels at noise-sensitive locations along the major vehicular access routes to the project site. Table 4.3.4-1 identifies the changes in future noise levels along the roadway segments that have residential uses, and therefore represent sensitive receptors. All future roadway analyses assumed completion of capital improvements as well as roadway improvement measures required as part of the project's traffic mitigation, as detailed in Section 4.1, Transportation, Traffic, and Circulation.

As stated in the factors section above, increases in ambient noise due to increases in project-related traffic are based on the FTA criteria specified in Table 4.3.1-2. As baseline ambient levels increase, smaller and smaller increments are allowed to limit increases in community annoyance. For example, in residential areas with a baseline ambient noise level of 50 dBA L_{dn}, a 5 dBA increase in noise levels would be acceptable, while at 70 dBA L_{dn}, only a 1 dBA increase would be allowed. The increases shown are based on a comparison of calculated future traffic noise levels with existing measured noise levels in the area.

Table 4.3.4-1. Modeled Traffic Noise Increases (dBA, L_{dn}) along Main Area Roadways - Alternative 2					
Roadway Segment	***Existing Noise Level[a]***	***Project-Related Increase***	***Buildout-Related Increase***	***Allowable Increase***	***Adverse Effect?***
3rd St – North of Evans Ave	70	0.6	2.8	1	No/Yes
3rd St - Evans Ave to Palou Ave	70	0.3	2.7	1	No/Yes
3rd St - Palou Ave to Carroll Ave	70	0.4	2.7	1	No/Yes
3rd St – South of Carroll Ave	70	0.4	2.5	1	No/Yes
Evans Ave – 3rd St to Hunters Point Blvd	65	2.1	4.8	1	Yes/Yes
Palou Ave - 3rd St to Crisp Rd	65	2.0	3.1	1	Yes/Yes
Carroll Ave – 3rd St to Ingalls St	65	0.0	1.8	1	No/Yes
Innes Ave – Hunters Point Blvd to Donahue St	65	3.2	3.6	1	Yes/Yes
Donahue St – Innes Ave to Galvez Ave	60	6.1	6.4	2	Yes/Yes
Donahue St –Galvez Ave to Lockwood St	60	5.2	5.5	2	Yes/Yes
Galvez Ave - Donahue St to Robinson St	60	2.2	2.4	NA[b]	No
Lockwood St – Donahue St to Fischer Ave	60	3.1	3.2	NA	No
Crisp Rd - - Palou Ave to Spear Ave	60	6.2	6.8	NA	No
Spear Ave – Crisp Rd to Morrell St	60	6.2	6.7	NA	No

Notes:
a. Existing noise levels estimated from ambient noise levels presented in Section 3.3.
b. NA – No noise sensitive land uses.

Sources: Appendix I3 of the CP-HPS DEIR (SFRA 2009); and Illingworth & Rodkin, Inc. 2010.

Traffic related to Alternative 2 operations would cause a substantial increase in noise at residences along Donahue St, Palou Ave, and the Innes Ave/Evans Ave corridor. Buildout would also cause a substantial noise increase along 3rd St. This increment is large enough to exceed the adopted factor for a "substantial permanent increase" in traffic noise in residential areas.

Mitigations 4 and 5 would address traffic noise increases in these residential areas. However, while they are readily applicable to new construction, their applicability to existing structures may be limited. An acoustical and retrofitting program would reduce interior noise levels in some affected residential structures. However, the exterior noise level increase could still exceed the significance factor, even with implementation of an acoustical and retrofitting program.

Operation of the project would generate increased local traffic volumes that could cause a substantial permanent increase in ambient noise levels in existing residential areas along the major project site access routes. Therefore, potential impacts would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, but impacts would remain *significant and unavoidable*.

4.3.4.2.4 Factor 7: Exposure to Excessive Event Noise Levels

There would be no stadium under this alternative. Therefore, *no noise impacts* associated with events at the stadium would occur, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option would not cause substantial changes in noise, and impacts would *not be significant*.

4.3.4.2.5 Factor 8: Exposure to Excessive Aircraft Noise Levels

The alternative would not expose people living or working onsite to excessive noise from commercial aircraft overflights associated with SFO operations. Therefore, impacts would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option would not cause substantial changes in noise, and impacts would *not be significant*.

4.3.5 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

Under Alternative 2A, a new stadium would not be constructed and instead, additional housing and R&D uses emphasizing emerging technologies would be developed at HPS. Approximately 4,275 housing units would be developed within the project site (as compared to 2,650 for Alternative 1) and 8,214 jobs would be generated. The number of construction personnel required at any given time would be similar to the total project for Alternative 1. Alternative 2A would include nearly the same new parks, open space facilities, and sports fields as proposed under Alternative 1 (221.8 ac vs. 231.6 ac) with more acreage allocated to parks and correspondingly less to sports fields. A Yosemite Slough bridge that would serve only transit, bike, and pedestrian traffic would extend Arelious Walker Dr from Candlestick Point to HPS. The bridge would be narrower than for Alternative 1 at approximately 40-ft (12 m) wide, and would cross the slough at the same location as Alternative 1. The bridge and its approach streets would have two dedicated transit lanes and a separate Class I bicycle and pedestrian lane, which would be open at all times. Alternative 2A includes a variant that would increase the footprint of Tower D by a small amount. While this would make a minor difference to construction noise generation related to tower construction, it would not alter the impact analyses for construction in the next sections.

4.3.5.1 Construction Impacts

In general, although the timing would be somewhat different, the overall construction activity for this alternative would be similar to that for Alternative 1. Alternative 2A new development would not involve construction of a stadium. The location of the stadium would be filled by expanded R&D space. While the stadium would not be built, and pile driving may not be required in that location, the R&D construction would occur in the same location with largely the same effects.

4.3.5.1.1 Factor 1: Exposure to Excessive Construction Noise Levels

Construction Impacts at Offsite Noise-Sensitive Receptors

As for Alternative 1, all offsite construction activities associated with Alternative 2A would comply with Sections 2907 and 2908 of the Noise Ordinance and implement mitigation (**Mitigations 1 and 2** described above). Compliance with the Noise Ordinance and implementation of the identified mitigation would reduce the *residual* impact of construction noise to offsite receptors from construction to *not be significant*.

Construction Impacts at Future Onsite Noise-Sensitive Receptors

As for Alternative 1, construction of the HPS Village Center district would be located within 50 ft (15 m) of the HPS North district residential uses. Noise levels from pile driving activities could be as high as 107 dBA for the residential uses within the HPS North district (assuming a distance of 25 ft (8 m). Other construction activities such as grading, excavation, paving, and structural finishes would be anticipated to produce noise levels of up to 89 dBA. Construction of Alternative 2A would comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M and limits noise from any individual piece of construction equipment (except impact tools) to 80 dBA at 100 ft (30 m) unless the construction activity occurred during allowable hours. **Mitigations 1 and 2** would be implemented during construction of Alternative 2A to reduce noise levels. Compliance with the Noise Ordinance and implementation of **Mitigations 1 and 2** would reduce the *residual* impact to offsite receptors from construction related noise to *not be significant*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, and *residual* impacts would *not be significant* with mitigation.

4.3.5.1.2 Factor 2: Exposure to Excessive Construction Vibration Levels

Construction Impacts of Vibration at Offsite Vibration-Sensitive Receptors

Offsite roadway improvements would result in construction activities occurring within 25 ft (8 m) of existing residential uses. Groundborne vibration generated by construction trucks would be consistent with the level of vibration from deliveries that are currently made along roadways in the project vicinity to nearby commercial uses as a result of ongoing commercial and industrial activities, and would not increase groundborne vibration above existing levels. Construction of offsite roadway improvements would not expose sensitive receptors off site to excessive groundborne vibration or groundborne noise levels. Therefore, potential impacts would *not be significant* and no mitigation is proposed.

Construction Impacts of Vibration at Future Onsite Vibration-Sensitive Receptors

Construction of the residential and commercial uses in the HPS Village Center would include two high-rise towers that would require the construction of deep foundations using pile drivers. The HPS Village Center would be located within 50 ft (15 m) of the HPS North district residential uses. Groundborne vibration levels associated with offsite roadway improvements would be 86 VdB due to the vibration from loaded trucks and bulldozers for grading. This would exceed the FTA's 80 VdB threshold for residential uses for infrequent events.

Implementation of **Mitigations 1, 2, and 3** would reduce the intensity of vibration impacts. The construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 & 2908 of the Municipal Code. However, vibration levels would remain *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, but residual impacts would remain *significant and unavoidable.*

4.3.5.1.3 Factor 3: Increases in Ambient Noise Levels from Construction

Pile driving would be required for development of the residential towers in the HPS North district, with noise levels of up to 101 dBA at a distance of 50 ft (15 m). Further, the approximate noise levels experienced by adjacent noise-sensitive uses due to construction activities occurring during offsite roadway improvements, which are conservatively assumed to be 25 ft (8 m) from the proposed improvement activity, would be 91 dBA during the loudest offsite activities.

Implementation of **Mitigations 1, 2, and 3** would reduce noise impacts. However, these measures would not reduce impacts from pile driving activities below threshold levels. Noise levels during pile driving activities could reach up to 77-83 dBA at the existing residential use in the project vicinity, or 101 dBA in the new residential uses developed during earlier phases of the project. Implementation of the above-mentioned mitigation would reduce the noise levels associated with the loudest construction activities but temporary residual impacts associated with ambient noise levels would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, but residual impacts would remain *significant and unavoidable.*

4.3.5.2 Operational Impacts

While the stadium would not be constructed and, therefore, the mitigation required for stadium events would not be necessary, the overall operational noise from Alternative 2A would be comparable to that for Alternative 2.

4.3.5.2.1 Factor 4: Exposure of Persons to Excessive Noise Levels

Daily operation of Alternative 2A would generate noise levels that are comparable to a typical urban environment. As such, mechanical systems, daily deliveries, and trash collection would not result in increases of 5 dBA over the anticipated ambient noise level. Therefore, since the daily operational activity would not exceed the noise standards established by the Municipal Code, potential impacts would *not be significant* and no mitigation is proposed.

However, Alternative 2A would include the same types of development of new commercial, retail, and residential uses as Alternative 1. Noise exposure levels for these uses would be similar throughout the entire project site, with average noise levels ranging between 60 and 70 dBA. Alternative 2A would include residential use at Crisp Rd where noise levels are projected to range from 66-67 dBA L_{dn}. New residences would be exposed to exterior noise levels exceeding 60 dBA L_{dn} with interior noise levels exceeding 45 dBA L_{dn} so the residential noise exposure would be considered significant. **Mitigations 4 and 5** would reduce exterior and interior noise levels, and *residual* impacts would *not be significant.*

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, and *residual* impacts would *not be significant* with implementation of **Mitigations 4 and 5.**

4.3.5.2.2 Factor 5: Exposure to Excessive Vibration Levels

No substantial sources of groundborne vibration would be built as part of Alternative 2A. Therefore, operation of Alternative 2A would not expose sensitive receptors onsite or offsite to excessive groundborne vibration or groundborne noise and noise impacts. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option would not cause substantial changes in noise, and impacts would *not be significant*.

4.3.5.2.3 Factor 6: Exposure to Increased Traffic Noise Levels

The increase in traffic resulting from implementation of Alternative 2A and growth over the next 20 years would increase the ambient noise levels at noise-sensitive locations along the major vehicular access routes to the project site comparable to Alternative 2. Table 4.3.4-1 identifies the changes in future noise levels for Alternative 2 along the study area roadway segments that have residential uses and, therefore, represent sensitive receptors. The noise impacts associated with Alternative 2A are essentially the same as for Alternative 2. As stated in the significance factors, increases in ambient noise due to increases in project-related traffic are based on the FTA criteria specified in Table 4.3.1-2.

Alternative 2A-related traffic would cause a substantial increase in noise at residences along Donahue St, Palou Ave, and the Innes Ave/Evans Ave corridor. Buildout would also cause a substantial noise increase along 3rd St. This increment is large enough to exceed the adopted factor for a “substantial permanent increase” in traffic noise in residential areas.

Mitigations 4 and 5 would address significant traffic noise increases in these residential areas. However, while they are readily applicable to new construction, their applicability to existing structures may be limited. An acoustical and retrofitting program would reduce interior noise levels in some affected residential structures; however, the exterior noise level increase could still exceed the factor of significance, even with implementation of an acoustical and retrofitting program.

Operation of the project would generate increased local traffic volumes that could cause a substantial permanent increase in ambient noise levels in existing residential areas along the major project site access routes. Therefore, potential impacts would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, and impacts would remain *significant and unavoidable.*

4.3.5.2.4 Factor 7: Exposure to Excessive Event Noise Levels

There would be no stadium under this alternative, and no noise impacts associated with events at the stadium would occur. Therefore, *no impacts* would occur, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option would not cause substantial changes in noise, and *no impacts* would occur.

4.3.5.2.5 Factor 8: Exposure to Excessive Aircraft Noise Levels

The alternative would not expose people living or working on site to excessive noise from commercial aircraft overflights associated with SFO operations. Therefore, impacts would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option would not cause substantial changes in noise, and impacts would *not be significant*.

4.3.6 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

Under Alternative 3, a new stadium would not be constructed. Instead, additional housing would be developed at HPS. The following differences with respect to Alternative 1 have a bearing on the potential for noise impacts. Parks and sports field areas would be somewhat greater as compared to Alternative 1 (244.6 ac as compared to 231.6 ac). Retail and commercial space would be the same as Alternative 1. In addition, Alterative 3 would generate 6,956 new jobs (Economic & Planning Systems 2009) based on more limited employment opportunities, less than the 7,255 for Alternative 1. The number of construction personnel required at any given time would be similar to the total project for Alternative 1.

More housing would be constructed for Alternative 3: 4,000 units compared to 2,650 under Alternative 1. R&D square footage would be the same as Alternative 1.

4.3.6.1 Construction Impacts

In general, although the timing would be somewhat different, the overall construction activity for this alternative would be similar to that described for Alternative 1. The overall construction noise impacts of this alternative are expected to be essentially the same as those identified above for Alternative 1. While the stadium would not be built, and pile driving may not be required in that location, the residential construction would occur in the same location with largely the same effects. This alternative includes a variant that would increase the footprint of Tower D by a small amount. While this would make a minor difference to construction noise generation related to tower construction, it would not alter the impact analyses for construction in the next sections.

4.3.6.1.1 Factor 1: Exposure to Excessive Construction Noise Levels

Construction Impacts at Offsite Noise-Sensitive Receptors

As would be the case for Alternative 1, all offsite construction activities would comply with Sections 2907 and 2908 of the Noise Ordinance and implement mitigation (**Mitigations 1 and 2**). Compliance with the Noise Ordinance and implementation of the identified mitigations would reduce the *residual* impact of construction noise to offsite receptors to *not be significant*.

Construction Impacts at Future Onsite Noise-Sensitive Receptors

Construction of Alternative 3 would comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. Additionally, **Mitigations 1 and 2** would be implemented during construction. Further, as construction activities would only occur under the hours specified by Sections 2907 and 2908 of the Noise Ordinance, noise from construction would not violate any City Codes or other requirements placed on construction activity by the city or agency. Compliance with the Noise Ordinance and implementation of **Mitigations 1 and 2** would reduce the *residual* impact of construction noise to *not be significant*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, and *residual* impacts would *not be significant.*

4.3.6.1.2 Factor 2: Exposure to Excessive Construction Vibration Levels

Construction Impacts of Vibration at Offsite Vibration-Sensitive Receptors

Offsite roadway improvements would result in construction activities occurring within 25 ft (8 m) of existing residential uses. Groundborne vibration generated by construction trucks would be consistent with deliveries that are currently made along roadways in the project vicinity to nearby commercial uses as a result of ongoing commercial and industrial activities and would not increase groundborne vibration above existing levels. Construction of offsite roadway improvements would not expose sensitive receptors off site to excessive groundborne vibration or groundborne noise levels. Therefore, potential impacts would *not be significant*, and no mitigation is proposed.

Construction Impacts of Vibration at Future Onsite Vibration-Sensitive Receptors

Construction of the residential and commercial uses in the HPS Village Center would include two high-rise towers that would require the construction of deep foundations using pile drivers. The HPS Village Center would be located within 50 ft (15 m) of the HPS North district residential uses. Groundborne vibration levels associated with offsite roadway improvements would be 86 VdB due to the vibration from loaded trucks and bulldozers for grading. This would exceed the FTA's 80 VdB threshold for residential uses for infrequent events.

Implementation of **Mitigations 1, 2, and 3** would help to reduce these vibration impacts. In addition, construction vibration impacts would be temporary, would not occur during recognized sleep hours, and construction activities would only occur during the hours of 7:00 A.M. to 8:00 P.M. as specified by Sections 2907 and 2908 of the Noise Ordinance. Even so, residual impacts would remain *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, but residual impacts would remain *significant and unavoidable.*

4.3.6.1.3 Factor 3: Increases in Ambient Noise Levels from Construction

Construction activities occurring within the project site and in the vicinity for roadway and infrastructure improvements would involve demolition, grading, and excavation activities, followed by construction and external finishing of the proposed facilities and associated parking areas, as well as roadway and landscaping improvements. Pile driving would be required for development of the residential towers in the HPS North district, with noise levels of up to 101 dBA at a distance of 50 ft (15 m). Further, the approximate noise levels experienced by adjacent noise-sensitive uses due to construction activities occurring during offsite roadway improvements, which are conservatively assumed to be 25 ft (8 m) from the proposed improvement activity, would be 91 dBA during the loudest offsite activities.

Implementation of **Mitigations 1, 2, and 3** would reduce these impacts; however, construction activities would still occur within 25 ft (8 m) of existing and future residential uses. Pile-driving and excavation activities would occur intermittently throughout the 18-year construction phasing, and, therefore, this temporary increase in ambient noise levels would be noticeable and would likely be cause for human annoyance. Implementation of the above-mentioned mitigations would reduce the noise levels associated with the loudest construction activities identified above, but not below threshold levels. Therefore, residual impacts associated with construction-related increases in ambient noise levels would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, but residual impacts remain *significant and unavoidable.*

4.3.6.2 Operational Impacts

While the stadium would not be constructed and, therefore, the mitigation required for stadium events would not be necessary, the overall operational noise from the alternative would be comparable to that for Alternative 1.

4.3.6.2.1 Factor 4: Exposure to Excessive Noise Levels

Daily operations of new commercial, retail, and residential uses would be essentially the same as for Alternative 1. Upon build-out, the entire project site would have a daily noise environment of a typical urban area with average noise levels ranging between 60 and 70 dBA. Residences would be exposed to exterior noise levels exceeding 60 dBA L_{dn} and interior noise levels exceeding 45 dBA L_{dn}.

Daily operation of the alternative would generate noise levels that are comparable to a typical urban environment. As such, mechanical systems, daily deliveries, and trash collection would not result in increases of 5 dBA over the anticipated ambient noise level. Implementation of **Mitigations 4 and 5** would reduce exterior and interior noise levels and *residual* impacts would *not be significant.*

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, and *residual* impacts would *not be significant* with implementation of **Mitigations 4 and 5**.

4.3.6.2.2 Factor 5: Exposure to Excessive Vibration Levels

Typical background vibration levels in inhabited areas are about 50 VdB. Such vibration background levels would be expected generally on the project site after the completion of all project-related construction activities. This is substantially less than the FTA's vibration impact threshold of 80 VdB for human annoyance. These types of deliveries would be consistent with deliveries that are currently made along roadways in the project vicinity to nearby commercial uses, and on site as a result of ongoing commercial and industrial operations, and would not increase groundborne vibration above existing levels. No substantial sources of groundborne vibration would be built as part of the alternative. Therefore, since operation would not expose sensitive receptors on site or off site to excessive groundborne vibration or groundborne noise levels potential impacts would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option would not cause substantial changes in noise, and impacts would *not be significant*.

4.3.6.2.3 Factor 6: Exposure to Increased Traffic Noise Levels

The increase in traffic resulting from implementation of Alternative 3 and ambient growth over the next 20 years would increase the ambient noise levels at noise-sensitive locations along the major vehicular access routes to the project site. Table 4.3.6-1 identifies the changes in future noise levels along the study area roadway segments that have residential uses, and therefore represent sensitive receptors. All future roadway analyses assumed completion of capital improvements as well as roadway improvement measures required as part of the project's traffic mitigation, as detailed in Section 4.1, Transportation, Traffic, and Circulation.

As stated in the factors section above, increases in ambient noise due to increases in project-related traffic are based on the FTA criteria specified in Table 4.3.1-2. As baseline ambient levels increase, smaller and smaller increments are allowed to limit increases in community annoyance. The increases shown are based on a comparison of calculated future traffic noise levels with existing measured noise levels in the area.

As indicated in Table 4.3.6-1, project-related traffic would cause a substantial increase in noise at residences along Donahue St, Palou Ave, and the Innes Ave/Evans Ave corridor. Buildout would also cause a substantial noise increase along 3rd Street. This increment is large enough to exceed the factor for a "substantial permanent increase" in traffic noise in residential areas.

Table 4.3.6-1. Modeled Traffic Noise Increases (dBA, L_{dn}) along Main Area Roadways - Alternative 3					
Roadway Segment	*Existing Noise Level[a]*	*Project-Related Increase*	*Buildout-Related Increase*	*Allowable Increase*	*Adverse Effect?*
3rd St – North of Evans Ave	70	0.5	2.7	1	No/Yes
3rd St - Evans Ave to Palou Ave	70	0.3	2.6	1	No/Yes
3rd St - Palou Ave to Carroll Ave	70	0.4	2.7	1	No/Yes
3rd St – South of Carroll Ave	70	0.3	2.5	1	No/Yes
Evans Ave – 3rd St to Hunters Point Blvd	65	1.8	4.6	1	Yes/Yes
Palou Ave - 3rd St to Crisp Rd	65	1.6	2.8	1	Yes/Yes
Carroll Ave – 3rd St to Ingalls St	65	0.0	1.7	1	No/Yes
Innes Ave – Hunters Point Blvd to Donahue St	65	2.7	3.1	1	Yes/Yes
Donahue St – Innes Ave to Galvez Ave	60	5.3	5.6	2	Yes/Yes
Donahue St –Galvez Ave to Lockwood St	60	4.4	4.7	2	Yes/Yes
Galvez Ave - Donahue St to Robinson St	60	1.9	2.1	NA[b]	No
Lockwood St – Donahue St to Fischer Ave	60	2.8	2.9	NA	No
Crisp Rd - - Palou Ave to Spear Ave	60	5.2	5.9	NA	No
Spear Ave – Crisp Rd to Morrell St	60	5.1	5.8	NA	No

Notes:
a. Existing noise levels estimated from ambient noise levels presented in Section 3.3.
b. NA – No noise sensitive land uses.
Sources: Appendix I3 of the CP-HPS DEIR (SFRA 2009); and Illingworth & Rodkin, Inc. 2010.

Mitigations 4 and 5 would be implemented to address significant traffic noise increases in these residential areas. However, while they are readily applicable to new construction, their applicability to existing structures may be limited. An acoustical and retrofitting program would reduce interior noise levels in some affected residential structures; however, the exterior noise level increase could still exceed the factor of significance, even with implementation of an acoustical and retrofitting program.

Operation of the alternative would generate increased local traffic volumes that could cause a substantial permanent increase in ambient noise levels in existing residential areas along the major project site access routes. Therefore, residual impacts would be *significant and unavoidable*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option would not cause substantial additional noise, and residual impacts would be *significant and unavoidable.*

4.3.6.2.4 Factor 7: Exposure to Excessive Event Noise Levels

There would be no stadium under this alternative. Therefore, there would be *no impacts* associated with noise at the stadium, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option would not cause substantial changes in noise, and *no impacts* would occur.

4.3.6.2.5 Factor 8: Exposure to Excessive Aircraft Noise Levels

The alternative would not expose people living or working on site to excessive noise from commercial aircraft overflights associated with SFO operations. Therefore, impacts would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option would not cause substantial changes in noise, and impacts would *not be significant*.

4.3.7 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

Under Alternative 4, a new stadium would not be constructed. Instead, R&D and housing would be developed at a lower level than for Alternative 1. The following differences with respect to Alternative 1 have a bearing on the potential for noise impacts. There would be 1,750,000 square ft (162,750 m^2) of R&D space compared to 2,500,000 for Alternative 1 and 1,855 housing units compared to 2,650 for Alternative 1. There would be no residential towers. Parks and sports field areas would be 244.6 ac as compared to Alternative 1 with 231.6 ac. In addition, Alterative 4 would generate 4,846 new jobs based on the additional employment opportunities, considerably fewer than the 7,254 for Alternative 1.

4.3.7.1 Construction Impacts

In general, although the timing would be somewhat different, the overall construction activity for Alternative 4 would be similar to that for Alternative 1, although development would not involve construction of a stadium. As described below, the overall construction noise impacts of this alternative are expected to be essentially the same as those identified above for Alternative 1. While the stadium would not be built and pile driving may not be required in that location, and R&D and residential construction would be more limited, both in area and duration, construction would occur in the same location with largely the same effects. In addition, the development of Alternative 4 would not include the residential towers, so pile driving related to tower construction would not occur.

4.3.7.1.1 Factor 1: Exposure to Excessive Construction Noise Levels

Construction Impacts at Offsite Noise-Sensitive Receptors

As would be the case for Alternative 1, all offsite construction activities would be required to comply with Sections 2907 and 2908 of the Noise Ordinance and implement mitigation (**Mitigation 1 and 2**). Compliance with the Noise Ordinance and the mitigation would reduce the impact of construction noise to offsite receptors from construction related noise associated with HPS. Therefore, potential impacts would *not be significant* after mitigation.

Construction Impacts at Future Onsite Noise-Sensitive Receptors

Construction of Alternative 4 would comply with the San Francisco Noise Ordinance, which prohibits construction between 8:00 P.M. and 7:00 A.M. Additionally, **Mitigations 1 and 2** would be implemented during construction. Further, as construction activities would only occur under the hours allowed under Sections 2907 and 2908 of the Noise Ordinance, noise from construction would not violate any city codes or other requirements placed on construction activity by the city or agency. Compliance with the Noise Ordinance and implementation of **Mitigations 1 and 2** would reduce the *residual* impact to offsite receptors from construction related noise to *not be significant*.

4.3.7.1.2 Factor 2: Exposure to Excessive Construction Vibration Levels

Construction Impacts of Vibration at Offsite Vibration-Sensitive Receptors

Offsite roadway improvements would result in construction activities occurring within 25 ft (8 m) of existing residential uses. Groundborne vibration generated by construction trucks would be consistent with deliveries that are currently made along roadways in the project vicinity to nearby commercial uses as a result of ongoing commercial and industrial activities and would not increase groundborne vibration above existing levels. Construction of offsite roadway improvements would not expose sensitive receptors off site to excessive groundborne vibration or groundborne noise levels. Therefore, impacts would *not be significant*, and no mitigation is proposed.

Construction Impacts of Vibration at Future Onsite Vibration-Sensitive Receptors

Construction of the residential and commercial uses in the HPS Village Center for Alternative 4 would not include the two high-rise towers. Therefore, no pile driving would occur in close proximity to occupied residences. Implementation of **Mitigation 1** would reduce this impact by requiring that vibration-producing equipment be located as far away from sensitive receptors as practicable. The alternative's construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 & 2908 of the Municipal Code. Therefore, with implementation of **Mitigation 1**, *residual* impacts associated with vibration associated with onsite construction would *not be significant*.

4.3.7.1.3 Factor 3: Increases in Ambient Noise Levels from Construction

Construction activities occurring at the project site and in the vicinity for roadway and infrastructure improvements would involve demolition, grading, and excavation activities, followed by construction and external finishing of the proposed facilities and associated parking areas, as well as roadway and landscaping improvements. Estimated noise levels experienced by adjacent noise-sensitive uses due to construction activities occurring during offsite roadway improvements, which are conservatively assumed to be 25 ft (8 m) from the proposed improvement activity, would be 91 dBA during the loudest offsite activities.

Implementation of **Mitigation 1** would help to reduce this impact by requiring that vibration-producing equipment be located as far away from sensitive receptors as practicable. Construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 & 2908 of the Municipal Code. Therefore, based on implementation of mitigation, *residual* impacts associated with the increased ambient noise from onsite construction would *not be significant*.

4.3.7.2 Operational Impacts

As described below, the overall operation noise impacts for this alternative are expected to be essentially the same as those for Alternative 1.

4.3.7.2.1 Factor 4: Exposure to Excessive Noise Levels

Daily operations of new commercial, retail, and residential uses would be essentially the same as for Alternative 1. Daily operation of Alternative 4 would generate noise levels that are comparable to a typical urban environment. As such, mechanical systems, daily deliveries, and trash collection would not result in increases of 5 dBA over the anticipated ambient noise level. The daily operational activity would not exceed the noise standards established by the Municipal Code. Therefore, impacts would *not be significant*, and no mitigation is proposed.

4.3.7.2.2 Factor 5: Exposure to Excessive Vibration Levels

Typical background vibration levels in inhabited areas are about 50 VdB. Such vibration background levels would be expected generally on the project site after the completion of all project-related construction activities. This is substantially less than the FTA's vibration impact threshold of 80 VdB for human annoyance. No substantial sources of groundborne vibration would be built as part of the alternative. Therefore, since operation would not expose sensitive receptors onsite or offsite to excessive groundborne vibration or groundborne noise levels, potential impacts would *not be significant*, and no mitigation is proposed.

4.3.7.2.3 Factor 6: Exposure of Persons to Increased Traffic Noise Levels

The increase in traffic resulting from implementation of the alternative and growth over the next 20 years would increase the ambient noise levels at noise-sensitive locations along the major vehicular access routes to the project site. Table 4.3.7-1 identifies the changes in future noise levels along the roadway segments that have residential uses and, therefore, represent sensitive receptors. All future roadway analysis assumed completion of capital improvements as well as roadway improvement measures required as part of the project's traffic mitigation as detailed in Section 4.1, Transportation, Traffic, and Circulation.

Table 4.3.7-1. Modeled Traffic Noise Increases (dBA, L_{dn}) along Main Area Roadways - Alternative 4

Roadway Segment	*Existing Noise Level*[a]	*Project-Related Increase*	*Buildout-Related Increase*	*Allowable Increase*	*Adverse Effect?*
3rd St – North of Evans Ave	70	0.4	2.6	1	No/Yes
3rd St - Evans Ave to Palou Ave	70	0.2	2.6	1	No/Yes
3rd St - Palou Ave to Carroll Ave	70	0.3	2.6	1	No/Yes
3rd St – South of Carroll Ave	70	0.2	2.4	1	No/Yes
Evans Ave – 3rd St to Hunters Point Blvd	65	1.4	4.4	1	Yes/Yes
Palou Ave - 3rd St to Crisp Rd	65	1.5	2.6	1	Yes/Yes
Carroll Ave – 3rd St to Ingalls St	65	0.0	1.6	1	No/Yes
Innes Ave – Hunters Point Blvd to Donahue St	65	2.2	2.7	1	Yes/Yes
Donahue St – Innes Ave to Galvez Ave	60	4.3	4.7	2	Yes/Yes
Donahue St –Galvez Ave to Lockwood St	60	3.6	3.9	2	Yes/Yes
Galvez Ave - Donahue St to Robinson St	60	1.4	1.6	NA[b]	No
Lockwood St – Donahue St to Fischer Ave	60	2.1	2.1	NA	No
Crisp Rd - - Palou Ave to Spear Ave	60	4.4	5.3	NA	No
Spear Ave – Crisp Rd to Morrell St	60	4.3	5.1	NA	No

Notes:
a. Existing noise levels estimated from ambient noise levels presented in Section 3.3.
b. NA – No noise sensitive land uses.

Sources: Appendix I3 of the CP-HPS DEIR (SFRA 2009); and Illingworth & Rodkin, Inc. 2010.

Increases in ambient noise due to increases in project-related traffic are based on the FTA criteria specified in Table 4.3.1-2. As baseline ambient levels increase, smaller and smaller increments are allowed, to limit increases in community annoyance. The increases shown are based on a comparison of calculated future traffic noise levels with existing measured noise levels in the area.

As indicated in Table 4.3.7-1, project-related traffic would cause a substantial increase in noise at residences along Donahue St, Palou Ave, and the Innes Ave/Evans Ave corridor. Buildout would also cause a substantial noise increase along 3rd St. This increment is large enough to exceed the factor for a "substantial permanent increase" in traffic noise in residential areas.

Mitigations 4 and 5 would be implemented to address traffic noise increases in these residential areas. However, while they are readily applicable to new construction, their applicability to existing structures may be limited. An acoustical and retrofitting program would reduce interior noise levels in some affected residential structures. However, the exterior noise level increase could still exceed the factor, even with implementation of an acoustical and retrofitting program.

Operation of the alternative would generate increased local traffic volumes that could cause a substantial permanent increase in ambient noise levels in existing residential areas along the major project site access routes. Therefore, potential impacts would be *significant and unavoidable*.

4.3.7.2.4 Factor 7: Exposure to Excessive Event Noise Levels

There would be no stadium in this alternative. Therefore, there would be *no impacts* associated with noise at the stadium, and no mitigation is proposed.

4.3.7.2.5 Factor 8: Exposure to Excessive Aircraft Noise Levels

The alternative would not expose people living or working on site to excessive noise from commercial aircraft overflights associated with SFO operations. Therefore, impacts would *not be significant,* and no mitigation is proposed.

4.3.8 No Action Alternative

Under the No Action Alternative in the 2000 FEIS and in this document, HPS would not be disposed of, and would remain a closed federal property under caretaker status.[1] Thus, the remaining parcels would not be reused or redeveloped. Environmental cleanup would continue until completion. No new leases would be executed under the No Action Alternative. Existing leases would continue until they expire or are terminated, after which the DoN could decide to renew or extend some or all of these leases. Environmental impacts associated with the renewal or extension of existing leases would be evaluated before making such decisions.

4.3.8.1 Construction Impacts

The No Action Alternative would involve no substantial change from current operations. No new construction would occur. Therefore, there would be *no noise impacts* associated with construction under the No Action Alternative.

4.3.8.2 Operational Impacts

Operations that currently occur at Hunters Point would continue into the future at current levels. There would be no increases in housing, R&D, recreational facilities, or infrastructure. Therefore, the noise environment at Hunters Point would remain essentially the same as at present. With no appreciable change in the ambient noise environment and no new introduction of noise generating activities, there would be *no noise impacts* associated with the No Action Alternative.

4.3.9 Mitigation

Table 4.3.9-1 describes the mitigation measures proposed to reduce potentially significant impacts associated with the proposed action and alternatives and the significance of the impact after mitigation.

[1] The portions of Parcel A (referred to as HPS Phase I Redevelopment) is not included as part of the alternatives analyzed in this SEIS because Phase I has already been disposed of by the DoN and is currently being developed as residential housing.

Table 4.3.9-1. Mitigations for Potential Significant Impacts for the Proposed Action and Alternatives

Significance Factor	***Mitigation Measures***						
	Alternative 1 (Stadium Plan Alternative)	*Alternative 1A (Stadium Plan/No-Bridge Alternative)*	*Alternative 2 (Non-Stadium Plan/Additional R&D Alternative)*	*Alternative 2A (Non-Stadium Plan/Housing and R&D Alternative)*	*Alternative 3 (Non-Stadium Plan/Additional Housing Alternative)*	*Alternative 4 (Non-Stadium Plan/Reduced Development Alternative)*	*No Action Alternative*
Factor 1: Exposure to Excessive Construction Noise Levels	***Mitigation 1:*** Construction document mitigation to reduce noise levels during construction. ***Residual Impact after Mitigation:*** Not significant.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1	Same as Alternative 1.	Same as Alternative 1.	No significant impacts would be expected and no mitigation proposed.
	Mitigation 2: Noise-reducing pile driving techniques and muffling devices. ***Residual Impact after Mitigation:*** Not significant.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts because there would be no pile driving for residential towers	No significant impacts would be expected and no mitigation proposed.
Factor 2: Exposure of persons to or generation of groundborne vibration or groundborne noise levels in excess of FTA criteria.	***Mitigation 3:*** Pre-construction assessment to minimize pile driving impacts. ***Residual Impact after Mitigation:*** Significant and unavoidable.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts because there would be no pile driving for residential towers	No significant impacts would be expected and no mitigation proposed.

Table 4.3.9-1. Mitigations for Potential Significant Impacts for the Proposed Action and Alternatives

Significance Factor	***Mitigation Measures***						
	Alternative 1 (Stadium Plan Alternative)	*Alternative 1A (Stadium Plan/No-Bridge Alternative)*	*Alternative 2 (Non-Stadium Plan/Additional R&D Alternative)*	*Alternative 2A (Non-Stadium Plan/Housing and R&D Alternative)*	*Alternative 3 (Non-Stadium Plan/Additional Housing Alternative)*	*Alternative 4 (Non-Stadium Plan/Reduced Development Alternative)*	*No Action Alternative*
Factor 3: Substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project from construction activities.	***Mitigations 1, 2, and 3*** would reduce impacts but they would remain significant. ***Residual Impact after Mitigation:*** Significant and unavoidable.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts would be expected and no mitigation proposed.
Factor 4: Substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.	***Mitigation 4:*** Site planning would consider the use of barriers or buildings to shield residential outdoor activity areas. ***Residual Impact after Mitigation:*** Not significant.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts would be expected and no mitigation proposed.
	Mitigation 5: New residences would include sound attenuating building elements. ***Residual Impact after Mitigation:*** Not significant.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts would be expected and no mitigation proposed.

Table 4.3.9-1. Mitigations for Potential Significant Impacts for the Proposed Action and Alternatives							
Significance Factor	***Mitigation Measures***						
	Alternative 1 (Stadium Plan Alternative)	*Alternative 1A (Stadium Plan/No-Bridge Alternative)*	*Alternative 2 (Non-Stadium Plan/Additional R&D Alternative)*	*Alternative 2A (Non-Stadium Plan/Housing and R&D Alternative)*	*Alternative 3 (Non-Stadium Plan/Additional Housing Alternative)*	*Alternative 4 (Non-Stadium Plan/Reduced Development Alternative)*	*No Action Alternative*
Factor 6: Exposure of persons to noise levels in excess of FTA criteria.	No mitigation available. ***Residual Impact after Mitigation:*** Significant and unavoidable.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts would be expected and no mitigation proposed.
Factor 7: Exposure of persons to noise levels in excess of applicable standards in the City of San Francisco General Plan or Noise Ordinance.	***Mitigation 6:*** Mitigation to minimize game/concert-related temporary increases in ambient noise levels at nearby residences. ***Residual Impact after Mitigation:*** Significant and unavoidable.	Same as Alternative 1.	Not Applicable (no stadium)	Not Applicable (no stadium)	Not Applicable (no stadium)	Not Applicable (no stadium)	No significant impacts would be expected and no mitigation proposed.
	Mitigation 7: Residential use plan review by qualified acoustical consultant. ***Residual Impact after Mitigation:*** Significant and unavoidable.	Same as Alternative 1.	Not Applicable (no stadium)	Not Applicable (no stadium)	Not Applicable (no stadium)	Not Applicable (no stadium)	No significant impacts would be expected and no mitigation proposed.

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4.4 Land Use and Recreation

4.4.1 Methodology

4.4.1.1 Significance Factors

4.4.1.1.1 Land Use

Land use changes are not in themselves significant impacts. Land use changes are the result of conversion of a military installation once the property is transferred to civilian use.

Factors considered in determining whether an alternative would have significant impacts on land use include the extent or degree to which implementation of the alternative would:

Factor 1 Physically divide an established community;

Factor 2 Conflict with substantive requirements of land use plans or policies that, following property conveyance, would have jurisdiction over the project site; and/or

Factor 3 Result in land uses on the project site that are incompatible with, or would have a substantial adverse impact on, the existing character of adjacent land uses.

4.4.1.1.2 Recreation

Factors considered in determining whether an alternative would have significant impacts on recreational uses include the extent to which implementation of the alternative would:

Factor 1 Result in substantial adverse construction-related effects to existing parks and/or recreational facilities; and/or

Factor 2 Increase the use of existing parks and recreational facilities such that substantial physical deterioration or degradation of the facilities would occur or be accelerated or that new or expanded facilities would be required.

4.4.1.2 Analytic Method

4.4.1.2.1 Land Use Analysis

The land use analysis compares land use conditions at full build-out of each alternative against the existing land use environment or baseline condition on the ground. Changes in land use character at project build-out are described and assessed according to the significance factors listed in Section 4.4.1.1.1, Land Use.

The analysis of Factor 1 considers whether an alternative would contribute to physical division of an established community by constructing physical barriers or obstacles to circulation that would restrict existing patterns of movement between the project site and the project vicinity. An alternative's contribution to the continuity of the existing land use and circulation patterns is also considered in this analysis.

The analysis of Factor 2 discusses whether an alternative would be consistent with the substantive requirements of applicable land use plans and policies. Land use policies are policies that pertain to the type, location, and physical form of new development. Policy conflicts do not, in and of themselves, indicate a significant environmental effect.

The Factor 3 analysis of an alternative's effect on existing land use character includes consideration of the character of proposed development relative to the existing land use context. An adverse effect would occur if a new use were placed next to an incompatible existing use, such that the basic function of either the existing use or the new use would be impaired. For example, if a residential use were located next to a factory with toxic air emissions, either or both uses would be unable to function as intended.

The potential for a proposed alternative to contribute to secondary or indirect land use effects, such as adverse effects on retail or residential uses beyond the project site, are discussed in Section 4.6, Socioeconomics, under Factor 2 (Displacement of Housing) and Factor 3 (Displacement of Business), and in Section 6.5.5.5.1, Socioeconomics, of the Environmental Justice analysis.

4.4.1.2.2 Recreation Analysis

The analysis of Factor 1 considers if construction associated with each overall alternative would result in an adverse physical effect on existing park and recreational facilities.

The analysis of Factor 2 considers the increase in use that would be generated by an alternative and the ability of existing parks, recreational facilities, and open space and proposed facilities provided by an alternative to meet that demand. The analysis considers whether an increase in use would result in the substantial physical deterioration of existing parks, recreational facilities, and open space (e.g., disturbance of vegetation, accelerated wear on sports facilities and fields, erosion along trails, and an increased potential for increased graffiti and litter) or in the need for new or expanded facilities. The baseline for parks, recreational facilities, and open space in the project vicinity is discussed in Section 3.4, Land Use and Recreation.

Data used in this section includes information obtained from the SFRPD, the California Department of Parks and Recreation, as well as the CPSRA General Plan, Bay Plan, Water Trail Plan, and the General Plan.

4.4.2 Alternative 1: Stadium Plan Alternative

4.4.2.1 Land Use

Land uses for Alternative 1 are discussed in Section 2.3.2.1.1, Land Use, and shown on Figure 2.3-3, while proposed parks and open space are discussed in Section 2.3.2.1.2, Parks and Open Space, and shown in Table 2.3-6 and Figure 2.3-7. Alternative 1 would be built out by 2031, with the exception of parks/open space and a community facilities area within HPS South that would be completed by 2032.

4.4.2.1.1 Factors 1 through 3: Construction Impacts

Construction of Alternative 1 and Tower Variant D would not contribute to the physical division of an established community by constructing physical barriers or obstacles to circulation. In addition, construction would be designed and sited to be compatible with the existing federal, state, and local use guidelines, plans, and regulations. Therefore, *no significant* construction impacts on land use would occur, and no mitigation is proposed.

4.4.2.1.2 Operational Impacts

Factor 1: Physical Division of an Established Community

In the past, HPS operated as a secured military site and contained some commercial and industrial uses, with little physical connectivity to the surrounding community. Currently, artists' studios and a crime lab are the only active uses at the project site. Large undeveloped parcels and vacant buildings surround these uses, isolating them from uses in the project vicinity. As discussed in Section 3.4.3.1, Project Site, there is limited street access to the project site.

Upon full build-out of Alternative 1, approximately 861 ac (348 ha) of federal land would be integrated into the city, of which 421 ac (170 ha) would be made available for redevelopment. Alternative 1 would develop four development districts, with a new grid street pattern, medium- to high-density residential uses, neighborhood retail uses, R&D uses, a stadium, and associated parking uses at the project site. This alternative also would include new open space, parks, and recreational areas throughout the proposed districts and along the shoreline.

Alternative 1 would provide improved connectivity between the project site and land uses in the project vicinity by improving and providing new pedestrian, bicycle, transit, street, and open space network connections within the project site and to areas in the project vicinity. Proposed circulation improvements would include extension of street network from the surrounding neighborhoods to the project site, installation of sidewalks and other pedestrian improvements along existing streets, new bicycle lanes, rerouting of bus service to HPS, traffic calming features, the Yosemite Slough bridge, and a waterfront pedestrian and bicycle corridor connecting to the trail facilities along the India Basin shoreline to the northeast and to Candlestick Park to the southwest (Figure 2.3-8 through Figure 2.3-12). Therefore, Alternative 1 would not physically divide an established community; rather it would integrate HPS into the surrounding community. This is considered a beneficial impact. As such, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Minor changes to the bulk of the residential tower, associated with construction of Tower Variant D for Alternative 1, would not result in the physical division of an established community. Therefore, *no significant* impacts to land use would occur, and no mitigation is proposed.

Factor 2: Consistency with Land Use Plans and Policies

HPS is currently zoned as “Hunters Point SFRA District” by the city. However, current city zoning is not enforceable while HPS is still owned by and under the jurisdiction of the federal government. However, in anticipation of the disposal of HPS and to support the implementation of the amended HPS Redevelopment Plan, the city has amended its General Plan, Planning Code, and Zoning Map.

Upon completion of the BRAC disposal process, HPS would fall under the jurisdictional boundaries of the City and County of San Francisco. The use of land, the reuse of existing buildings and facilities, and the development of new buildings at HPS would be regulated by the city, the General Plan, HPS Area Plan, Planning Code, and other applicable plans, policies, and regulations listed in Section 3.4.2, Regulatory Framework.

The following consistency analysis describes the consistencies and inconsistencies of Alternative 1 with the major federal, state, and local land use plans and policies that are applicable to the reuse of HPS.

HUNTERS POINT SHIPYARD PHASE II PUBLIC TRUST LANDS AND SENATE BILL 792

As discussed in Section 3.4.2.2.1, State Lands Commission, the State Lands Commission, in cooperation with the California Attorney General, monitors granted lands for compliance with the public trust and the applicable granting statutes. Alternative 1 includes both trust consistent and trust inconsistent uses. Following implementation of the trust exchange agreement approved as part of Alternative 1, trust lands would be configured substantially as shown on the trust map included in Senate Bill 792. Project uses for trust lands (as configured under the trust exchange agreement) in Alternative 1 would be consistent with the public trust and other applicable statutory requirements.

COASTAL ZONE MANAGEMENT ACT

Under the CZMA, federal projects for activities must be consistent to the maximum extent practicable with the provisions of the federally approved state coastal management program, which includes the San Francisco Bay Plan (Bay Plan) and related San Francisco Bay Area Seaport Plan (Seaport Plan). DoN submitted a consistency determination to the BCDC on 12 January 1999 for the *HPS Redevelopment Plan* analyzed in the 2000 FEIS. The BCDC issued a Letter of Agreement for Consistency Determination

Number CN1-99 on 8 March 1999 (Appendix F). For the current proposed action, the BCDC provided a comment letter in October 2008 during the SEIS public scoping period (Appendix B).

SAN FRANCISCO BAY PLAN & SEAPORT PLAN

Alternative 1 (Stadium Reuse Plan) is mostly compatible with the objectives and policies of the Bay Plan and related Seaport Plan, including policies to minimize bay fill and to preserve the shoreline for uses that are regionally important, water-oriented uses needing or historically located on shoreline sites, such as ports, water-related industry, water-related recreation, airports, and wildlife refuges. This alternative involves minimal filling associated with construction of the Yosemite Slough bridge; construction of a marina; and improvement of the existing shoreline, waterfront bulkhead, piers, and seawall structures. Alternative 1 would provide improved access to the shoreline through shoreline improvements, open spaces, and a waterfront promenade.

However, Alternative 1 proposes land uses within a small portion of HPS (approximate 55-ac [22-ha] area located within HPS parcels D-1 and E [see Figure 3.7-1]), which are inconsistent with the existing Bay Plan, Seaport Plan, and the previous 1999 Consistency Determination. The Bay Plan and Seaport Plan designate this portion of the project site as a "Port" Priority Use Area. Within the port priority use areas, marine terminals are designated for receiving and shipping either containerized or bulk cargo. Alternative 1, and the 2010 Reuse Plan, proposes public and recreation land uses for this land area. As such, implementation of Alternative 1 would be inconsistent with the "Port" Priority Use designations in the Bay Plan and Seaport Plan. No other HPS parcel or proposed land uses affect a priority use area or are inconsistent with the goals and policies of the Bay Plan or Seaport Plan.

As discussed in Section 3.4.2.2.2, Bay Conservation and Development Commission, the existing "Port" Priority Use designation at the project site does not reflect current economic conditions affecting the maritime shipping industry in San Francisco and the fact that other existing and planned port facilities in the Bay Area (e.g., Port of Oakland) are being managed to meet current and anticipated port related transportation demand (CBRE Consulting and Martin Associates 2009).

In view of the lack of anticipated demand for maritime cargo facilities as discussed herein, and to make the proposed 2010 Reuse Plan consistent with the Bay Plan and Seaport Plan, the City and County of San Francisco is currently seeking an amendment to the Bay Plan and Seaport Plan to delete the "Port" Priority Use and marine terminal designations from the HPS property, and make conforming changes to the Bay Plan and Seaport Plan maps, map notes, policies and tables. It is anticipated that the amendment would be completed by mid-2012 (BCDC 2011). Following such amendment, Alternative 1 would be consistent with the Bay Plan and Seaport Plan.

The HPS property will be disposed of in phases by the DoN, and it is anticipated that parcels D-1 and E, which include the inconsistent 'Port' Priority Use area, would be disposed of in a later phase.

In the event that the Bay Plan and Seaport Plan are not amended before the portions of the project site designated as "Port" Priority Use (i.e., parcels D-1 and E) are conveyed, then a new consistency determination and, if necessary, an amendment to the 1999 Letter of Agreement may be required from BCDC before disposing of the property. Prior to the transfer of parcels D-1 and E, the DoN will review and, if necessary, provide BCDC with a consistency determination that may be required by the CZMA. DoN has coordinated with BCDC regarding this approach and documentation of this coordination is located in Appendix F.

Following disposal from federal ownership, the HPS property would be within the BCDC's jurisdiction and the future property owner and/or developer of the property would be required to obtain any applicable BCDC permits and other local, state, and federal approvals prior to implementing the 2010 reuse plan.

San Francisco Bay Trail Plan

As shown on Figure 4.4-1, Alternative 1 would include the construction of the Bay Trail throughout the project site, and would ultimately connect to the existing trail along the India Basin shoreline and the proposed trail along the Candlestick Point shoreline. The Bay Trail would be incorporated into the design of proposed parks facilities.

Overall, Alternative 1 is generally consistent with the Bay Trail Plan; however, it proposes an alignment for the Bay Trail that differs from the alignment proposed in the Bay Trail Plan. As shown on Figures 3.4.2-2 and 4.4-1, the Bay Trail Plan proposes planned trail improvements for the project site which are designated as "Planned Bay Trail – Not Developed." Alternative 1 would implement these planned changes by providing a continuous connection throughout the shoreline of the project site. However, under Alternative 1, the proposed alignment would be immediately adjacent to the shoreline as opposed to the slightly inland location proposed in the Bay Trail Plan. The Bay Trail alignment proposed in this alternative supports the aim of the Bay Trail Map to provide a continuous link throughout the property and the bay and provide additional links to parks, recreational facilities, and open space. In addition, this alignment would be an improvement over the alignment indicated on the Bay Trail Plan.

Implementation of Alternative 1 would require an amendment to the Bay Trail Plan to accommodate the new, improved alignment. Following such amendment, this alternative would be consistent with the Bay Trail Plan.

San Francisco General Plan/HPS Area Plan

In anticipation of the disposal of HPS, the city amended the General Plan to include the HPS Area Plan, which along with the HPS Redevelopment Plan and the Design for Development document would guide future development of the project site. The General Plan and the HPS Redevelopment Plan are designed to be consistent with each other.

Following disposal of HPS, future development of most portions of the HPS would be under city jurisdiction. To achieve consistency between land use designations proposed under Alternative 1, the HPS Area Plan was adopted and the General Plan was amended consistent with the HPS Redevelopment Plan. Implementation of Alternative 1 would be consistent with the HPS Area Plan and the General Plan.

Bayview Hunters Point Area Plan

The project site is generally not within the boundary of the BVHP Area Plan, though it is included in some of the plan's objectives, policies, and discussions. This alternative is consistent with the BVHP Area Plan because new development would provide needed economic development both through construction and permanent jobs in a wide variety of fields and job types. The project's programming would designate approximately 21 percent of the proposed housing within HPS as below market rate for various income levels and housing types. In addition, this alternative would offer a wide range of recreational and open space opportunities.

Proposition G

Alternative 1 would be consistent with the objectives of Proposition G including those pertaining to population, housing, and employment. Proposition G proposed that new zoning be established along with a land use program for HPS. Alternative 1 would be consistent with Proposition G and proposes to amend the existing zoning to be consistent with Proposition G.

Hunters Point Shipyard Redevelopment Plan

The HPS Redevelopment Plan was adopted by the Board of Supervisors on 14 July 1997 and amended on 3 August 2010 (SFRA 1997, amended 2010). The proposed redevelopment of HPS, as described in the HPS Redevelopment Plan, is consistent with the General Plan, the Bayview Hunters Point Area Plan, and the HPS Area Plan as adopted and amended by the San Francisco Planning Commission on June 3, 2010, and is in conformity with the eight Priority Policies of Section 101.1 of the Planning Code. The HPS Redevelopment Plan sets forth the objectives and the basic land use controls within which specific redevelopment activities within the project site can be pursued. Allowable land uses within each district would be those consistent with the character of the districts as described in the HPS Redevelopment Plan and summarized in Section 3.4, Land Use and Recreation. The land uses within the development districts proposed under Alternative 1 are shown on Figure 2.3-3 and Table 2.3-5. The HPS North district would include residential, neighborhood retail, and parks and open space. The HPS Village Center district would include residential, neighborhood retail, artists' studios, and parks and open space. The R&D district would include residential, neighborhood retail, R&D, and parks and open space. The HPS South-R&D district would include community services, a stadium, and parks and open space. Alternative 1 is consistent with the land uses and basic land use controls within each district contained in the HPS Redevelopment Plan.

SAN FRANCISCO PLANNING CODE

As a federal facility, the project site is not currently subject to or included in the Planning Code. To achieve consistency between the selected reuse alternative and city policies, the General Plan was amended to include land use designations for HPS. In addition, the Planning Code was amended consistent with the General Plan, HPS Area Plan, and HPS Redevelopment Plan. Upon disposal of HPS, the project site would be subject to the land use and height and bulk regulations established by the zoning. These controls would be subject to the HPS Area Plan, the HPS Redevelopment Plan and its Design for Development standards, and would likely include site design measures, such as buffering, landscaping, screening, and setbacks, to ensure high quality development and compatibility between land uses. Alternative 1 would be consistent with the Planning Code.

SAN FRANCISCO SUSTAINABILITY PLAN

Alternative 1 contains a number of features that are consistent with the policies articulated in the Sustainability Plan. Transportation objectives focus on reducing vehicle miles and facilitating the use of transit, bicycles, and walking. Alternative 1 would provide automobile, public transportation, and pedestrian connections between HPS and surrounding neighborhoods; integrate land use patterns with multimodal street networks that would facilitate walking and cycling for internal trips and transit for trips of greater distance; extend existing Muni routes to better serve the site and area; increase frequencies on existing routes to provide more capacity; and complement those existing routes with new transit facilities and routes that would serve the proposed land use program and transit demand.

Another goal the Sustainability Plan calls for is reducing overall electrical use through maximizing energy efficiency. Alternative 1 would exceed the 2008 Standards for Title 24 Part 6 energy efficiency standards for homes and businesses; install ENERGY STAR appliances, where appliances are offered by homebuilders; and use energy efficient street lighting.

SUMMARY

Alternative 1 is generally consistent with goals and objectives of applicable plans and policies. However, Alternative 1 is inconsistent with various land use designations contained in several of these plans, including the Bay Plan, the Seaport Plan, Bay Trail Plan, and the HPS Phase II Public Trust Lands. Amendments to these relevant plans would be prepared as part of Alternative 1 to eliminate inconsistencies. In addition, in the event that the Bay Plan is not amended before the portions of the project site designated as "Port" Priority Use (i.e., parcels D-1 and E) are conveyed, then new consistency determinations may be required for those areas. Prior to the transfer of parcels D-1 and E, DoN would provide BCDC any further consistency determinations that may be required by the CZMA. Following HPS disposal, projects within BCDC's jurisdiction may require BCDC permits. Therefore, *no significant* operational impacts on land use would occur, and no mitigation is proposed.

Minor changes to the bulk of the residential towers, associated with operation of Tower Variant D for Alternative 1, would not result in inconsistencies with adopted and relevant land use plans and policies. Therefore, *no significant* impacts on land use would occur, and no mitigation is proposed.

Factor 3: Change the Existing Land Use Character

Under Alternative 1, the built environment of HPS would be more densely developed than under existing conditions. The redevelopment would introduce new and active land uses to the project site, including R&D uses, residential uses, neighborhood retail uses, a stadium, a marina, and public open space.

This alternative would remove most of the large, vacant industrial and administrative buildings existing at HPS as well as develop the project site where buildings have already been cleared. Full build-out of Alternative 1 would provide the land area to develop a maximum of 2,650 residential units, over 125,000 ft^2 (11,613 m^2) of neighborhood retail, 2,500,000 ft^2 (232,258 m^2) of R&D development, 255,000 ft^2 (23, 690 m^2) of artists' studios and art center, 50,000 ft^2 (4,645 m^2) of community services, approximately 231 ac (93 ha) of parks and open space, a 300-slip marina, a 69,000-seat stadium, and the Yosemite Slough bridge. Alternative 1 would retain certain structures, piers, drydocks, and the prominent Re-Gunning Crane. This alternative would extend the existing street grid and block pattern into HPS. The open space network would connect to the shoreline to the north and south. The land uses proposed under Alternative 1 would be allowed under existing land use and zoning plans, policies, and regulations.

Reuse of HPS as proposed under Alternative 1 would alter the existing land use character at HPS by converting the currently underutilized land uses within the project site to productive mixed-uses; retain artists; provide infrastructure improvements and community services; provide public parks, open space, and recreational facilities; and create economic growth. As such, Alterative 1 would improve the existing land use condition at HPS and would result in a beneficial impact.

The proposed land use changes would increase the density and type of activities at the project site. Impacts on occupied buildings at HPS could be expected due to renovation and removal of some buildings and the changes in land uses surrounding these buildings. Land use changes resulting from Alternative 1 would create a more cohesive and planned use of HPS. Public access to HPS is currently controlled with the exception of access at Innes Ave. Implementing Alternative 1 would increase open space areas available to the public. This open space would be a substantial addition to HPS and would be considered an overall beneficial impact. Planned land use changes and the potential intensification of use within HPS under Alternative 1 would fulfill major objectives and policies of the HPS Redevelopment Plan and would be considered *not significant*.

Land uses and zoning in the project vicinity are guided by the BVHP Area Plan and the *Candlestick Point Subarea Plan* as well as the General Plan and the Planning Code. Alternative 1 would not directly impact land uses in the project vicinity since the proposed development would be located within HPS.

Development under Alternative 1 would contrast with the existing land use character and patterns in the project vicinity. The scale of development in the project vicinity ranges from two-story residential structures to larger scale warehouse and light-industrial structures. Alternative 1 would include R&D uses, two residential towers ranging from 270 to 370 ft (83.3 to 113 m) in height, a large-scale stadium with related parking, and dual-use open space areas. These land uses would be noticeably different from residences and businesses in the project vicinity. In the areas within the HPS North and HPS South districts, the planned open space would serve as a buffer between existing offsite uses and proposed onsite land uses. In addition, the land use pattern within the project site would transition from lower-density residential uses near existing neighborhoods in the project vicinity to higher-density residential, R&D, and stadium uses toward the waterfront of the project site (Figure 2.3-3). The juxtaposition of onsite uses and uses in the project vicinity would not be significant due to this buffering and transition in density, scale, and uses. As such, Alternative 1 would not adversely change the existing character at HPS or the project vicinity. Rather, Alternative 1 would improve the existing land use conditions, a beneficial impact. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

The potential for Alternative 1 to contribute to secondary or indirect land use effects, such as adverse effects on retail or residential uses beyond the project site, are discussed in Section 4.6, Socioeconomics, under Factor 2 (Displacement of Housing) and Factor 3 (Displacement of Business), and Section 6.5.5.5.1, Socioeconomics, of the Environmental Justice analysis.

Minor changes to the bulk of the proposed residential towers, associated with the operation of Tower Variant D for Alternative 1, would not substantially change the existing land use character beyond that discussed above for Alternative 1. Therefore, *no significant* impacts to land use would occur, and no mitigation is proposed.

4.4.2.2 Recreation

Alternative 1 includes the construction of substantial new parks, recreational facilities, and open space at HPS. At build-out, this alternative would include 231.6 ac (93.72 ha) of new parks and open space as described in Table 2.3-6 and illustrated by Figure 2.3-7.

4.4.2.2.1 Factor 1: Construction Impacts

Construction of Alternative 1 and Tower Variant D of Alternative 1 would not impact existing public parks, recreational facilities, and open space because none currently exist at HPS. Therefore, *no significant* construction impacts would result from development of the various parks, recreational facilities, and open space proposed under Alternative 1 and no mitigation is proposed.

4.4.2.2.2 Operational Impacts

Factor 2: Degradation or Deterioration of Existing Parks and Recreational Facilities

Alternative 1 would provide substantial new parks, recreational facilities, and open space within the project site and provide long-term funding for operation and maintenance of these facilities. The specific new parks, recreational facilities, and open space planned within the project site are discussed in Section 2.3.2.1.2, Parks and Open Space, and identified in Table 2.3-6 and Figure 2.3-7.

No public parks, recreational facilities, and/or open space currently exist at HPS. Consequently, no significant operational impacts on onsite existing parks, recreational facilities, and open space would occur under Alternative 1. Rather, Alternative 1 would create approximately 232 ac (94 ha) of new park and open space. Proposed recreational facilities, such as paved athletic courts, plazas, and picnic areas, would support a large number of users within a relatively small area. Recreational facilities proposed for the project site also include a Sports Field Complex that would provide soccer/football, baseball, and volleyball fields, as well as warm-up fields, restrooms, and food concessions. The parking area for the Sports Field Complex would support parking during stadium events, but would be covered with specially engineered soils and turf to allow dual-use of the parking lot for athletic fields. Recreational facilities would also include a mix of active and passive areas of open lawns, dog runs, play areas, community gardens, and court games. Moreover, improved park facilities would provide a waterfront promenade, ecological open space areas, concessions, restrooms, and other uses that would allow the site to support a large service population. The addition of these new park and open space facilities would be a beneficial impact.

Alternative 1 would provide unrestricted public access to recreational facilities at the project site. Additionally, the project would provide connectivity between the recreational facilities proposed at the project site and facilities in the project vicinity, and would allow integration of new and existing facilities into the citywide park network.

Alternative 1 would provide a network of pedestrian and bike pathways that would connect proposed recreational facilities at HPS to the adjacent neighborhoods. In addition, Alternative 1 would provide a continuous series of waterfront parks throughout the project site connecting to Candlestick Point. The proposed bicycle and pedestrian pathways would facilitate dispersal of future demand, which would help to reduce the potential for localized physical deterioration. The improved connectivity would also direct regional users (i.e., users who live within the region but not specifically on the project site) to proposed “destination” parks (i.e., parks designed to accommodate regional demand). Therefore, *no significant* operational impacts on existing offsite parks, recreational facilities, and open space would occur, and no mitigation is proposed.

Minor changes associated with operation of Tower Variant D for Alternative 1, would not result in additional jobs, residents, or parks, recreational facilities, or open space beyond that proposed for Alternative 1. Therefore, *no significant* operational impacts on existing parks, recreational facilities, and open space would occur, and no mitigation is proposed.

4.4.3 Alternative 1A: Stadium Plan/No-Bridge Alternative

4.4.3.1 Land Use

Land uses for the Alternative 1A are discussed in Section 2.3.2.2.1, Land Use. The land uses proposed under Alternative 1A would be the same as Alternative 1 with the exception of the Yosemite Slough bridge, which would not be constructed under Alternative 1A.

4.4.3.1.1 Factors 1 through 3: Construction Impacts

Construction of Alternative 1A and Tower Variant D of Alternative 1A would not contribute to the physical division of an established community by constructing physical barriers or obstacles to circulation. In addition, construction would be sited, designed, and constructed to be compatible with the applicable federal, state, and local land use plans and policies. Therefore, *no significant* construction impacts on land use would occur, and no mitigation is proposed.

4.4.3.1.2 Operational Impacts

Factor 1: Physical Division of an Established Community

Although the Yosemite Slough bridge would not be constructed under Alternative 1A and Tower Variant D of Alternative 1A, the operational impacts to land use with respect to physical division of an established community would be the same as those identified for Alternative 1. Upon full build-out of Alternative 1A, approximately 861 ac (348 ha) of federal land would be integrated into the city, of which 421 ac (170 ha) would be made available for redevelopment. As with Alternative 1, Alternative 1A would redevelop currently underutilized parcels and would extend the street grid from the surrounding neighborhoods to the project site, providing improved connectivity between existing and proposed residential and retail uses to the west of the project site. Increased connectivity between the project site and project vicinity would be a beneficial impact. Neither Alternative 1A nor Tower Variant D of Alternative 1A would physically divide an established community, and, therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Factor 2: Consistency with Land Use Plans and Policies

As with Alternative 1, upon completion of the BRAC disposal process, HPS would fall under the jurisdiction of the city, which would be responsible for providing municipal services and administration of the project site. The reuse of HPS would be regulated by applicable federal, state, and local plans that direct or regulate development on the project site as discussed in Section 3.4.2, Regulatory Framework, and

Section 4.4.2.1.2, Operational Impacts, under Alternative 1. The operational impacts to land use with respect to consistency with applicable land use plans and policies would be the same as those identified for Alternative 1. Alternative 1A would generally be consistent with the objectives and goals of applicable land use plans and policies, including the recently amended HPS Redevelopment Plan, HPS Area Plan, General Plan, and Planning Code. However, similar to Alternative 1, this alternative would be inconsistent with various land use designations contained in the HPS Phase II Public Trust Lands and Bay Trail Plan. Implementation of Alternative 1A would require an amendment to the Bay Trail Plan to accommodate the new, improved alignment. Following such amendment, this alternative would be consistent with the Bay Trail Plan. In addition, following implementation of the trust exchange agreement approved as part of Alternative 1A, trust lands would be configured substantially as shown on the trust map included in Senate Bill 792. Project uses in Alternative 1A for trust lands (as configured under the trust exchange agreement) would be consistent with the public trust and other applicable statutory requirements.

As with Alternative 1, Alternative 1A would be mostly compatible with the objectives and policies of the Bay Plan and Seaport Plan. This alternative involves minimal filling associated with a marina and improvement of the existing shoreline, waterfront bulkhead, piers, and seawall structures. Alternative 1A would provide improved access to the shoreline through shoreline improvements, open spaces, and a waterfront promenade.

The same as Alternative 1, Alternative 1A proposes land uses (public and recreation) within a 55-ac [22-ha] area, located within HPS parcels D-1 and E, which are inconsistent with the existing Bay Plan, Seaport Plan, and the previous 1999 Consistency Determination that designate this area as “Port” Priority Use. No other HPS parcel or proposed land uses affect a priority use area or are inconsistent with the goals and policies of the Bay Plan or Seaport Plan.

As discussed in Section 3.4.2.2.2, Bay Conservation and Development Commission, and the analysis of Factor 2, Consistency with Land Use Plans and Policies, in Section 4.4.2.1.2, the City and County of San Francisco is currently seeking an amendment to the Bay Plan and Seaport Plan to delete the “Port” Priority Use and marine terminal designations from the HPS property, and make conforming changes to the Bay Plan and Seaport Plan maps, map notes, policies, and tables (BCDC 2011). Following such amendment, Alternative 1A would be consistent with the Bay Plan and Seaport Plan. Prior to the transfer of parcels D-1 and E, the DoN would review and, if necessary, provide BCDC with a consistency determination that may be required by the CZMA. DoN has coordinated with BCDC regarding this approach and documentation of this coordination is located in Appendix F.

Following disposal from federal ownership, the HPS property would be within the BCDC's jurisdiction and the future property owner and/or developer of the property would be required to obtain any applicable BCDC permits and other local, state, and federal approvals prior to implementing the 2010 Reuse Plan. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Minor changes to the bulk of residential towers associated with Tower Variant D of Alternative 1A would not result in inconsistencies with applicable land use plans and policies. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Factor 3: Change to the Existing Land Use Character

Under Alternative 1A, the operational impacts to land use with respect to changes to the existing land use character would be the same as those discussed in Section 4.4.2.1.2, Operational Impacts, under Alternative 1. Reuse of HPS as proposed under Alternative 1A would convert the currently underutilized land uses within the project site to productive mixed-uses; retain artists; provide infrastructure improvements and community services; provide public parks, open space, and recreational facilities; and create economic growth. Alternative 1A would not result in a substantial adverse change in the existing land use character at the project site or in the project vicinity. Rather, proposed development at HPS would improve the existing land use conditions, a beneficial impact. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Minor changes to the bulk of the proposed residential towers, associated with the operation of Tower Variant D for Alternative 1A, would not substantially change the existing land use character beyond that discussed above for Alternative 1. Therefore, *no significant* impacts to land use would occur, and no mitigation is proposed.

4.4.3.2 Recreation

Alternative 1A includes the construction of 231.6 ac (93.72 ha) of new parks, recreational facilities, and open space. This alternative would include the same new parks, recreational facilities, and open space facilities as proposed under Alternative 1. The specific new parks, recreational facilities, and open space planned under Alternative 1A are discussed in Section 2.3.2.2.2, Parks and Open Space, and identified in Table 2.3-6 and Figure 2.3-7.

4.4.3.2.1 Factor 1: Construction Impacts

Alternative 1A and Tower Variant D of Alternative 1A would include the same parks, recreational facilities, and open space as described in Section 2.3.1.1.2, Parks and Open Space, for Alternative 1 and discussed in Section 4.4.2.2, Recreation. Construction of Alternative 1A and Tower Variant D would not impact existing public parks, recreational facilities, and open space because none currently exist at HPS. Therefore, *no significant* construction-related impacts on parks, recreational facilities, and open space would occur, and no mitigation is proposed.

4.4.3.2.2 Operational Impacts

Factor 2: Degradation or Deterioration of Existing Parks and Recreational Facilities

Alternative 1A would include the same new parks and recreational facilities proposed for Alternative 1 as described in Section 2.3.2.1.2, Parks and Open Space, and discussed in Section 4.4.2.2, Recreation. Alternative 1A would provide substantial new parks, recreational facilities, and open space within the project site and provide long-term funding for operation and maintenance of these facilities. No public parks, recreational facilities, and/or open space currently exist at HPS. As such, *no significant* operational impacts on existing parks, recreational facilities, and open space would occur, and no mitigation is proposed. Rather, the addition of these new park and open space facilities would be a beneficial impact.

Alternative 1A would provide unrestricted public access to recreational facilities at the project site. Additionally, the project would provide connectivity between the recreational facilities proposed at the project site and facilities in the project vicinity, and would allow integration of new and existing facilities into the citywide park network. This is a beneficial impact. Therefore, *no significant* operational impacts on existing offsite parks, recreational facilities, and open space would occur, and no mitigation is proposed.

Minor changes associated with operation of Tower Variant D for Alternative 1A would not result in additional jobs, residents, parks, recreational facilities, or open space beyond that proposed for Alternative 1A. Therefore, *no significant* operational impacts on existing parks, recreational facilities, and open space would occur, and no mitigation is proposed.

4.4.4 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

4.4.4.1 Land Use

Land uses for Alternative 2 are discussed in Section 2.3.2.3.1, Land Use, and shown on Figure 2.3-24. The land uses proposed under Alternative 2 would be the same as Alternative 1 in all districts, with the exception of the R&D and HPS South districts where the stadium proposed under Alternative 1 would be replaced with an additional 2,500,000 ft^2 (232,258 m^2) of R&D space.

4.4.4.1.1 Factors 1 through 3: Construction Impacts

Construction of Alternative 2 and construction of Tower Variant D and the Building Preservation option for Alternative 2 would not contribute to the physical division of an established community by constructing physical barriers or obstacles to circulation. In addition, construction would be designed and sited to be compatible with applicable federal, state, and local land use guidelines, planning documents, and regulations. Therefore, *no significant* construction impacts on the land use would occur, and no mitigation is proposed.

4.4.4.1.2 Operational Impacts

Factor 1: Physical Division of an Established Community

Upon full build-out of Alternative 2, approximately 861 ac (348 ha) of federal land would be integrated into the city and 421 ac (170 ha) would be made available for redevelopment. Like Alternative 1, Alternative 2 would redevelop currently underutilized parcels. Alternative 2 proposes infill development, centered on nodes of commercial and retail activity at the project site with no physical divisions. Residential and non-residential infill around these nodes of activity would provide a more continuous land use pattern and street grid; provide new services and community amenities in the BVHP neighborhood; allow better access to existing parks and recreational facilities; create new parks, recreational facilities, and open space; and remove existing barriers to circulation and access. Alternative 2 would not physically divide an established community; rather it would integrate HPS into the surrounding community. This is considered a beneficial impact. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 2 would not cause a physical division of an established community. *No significant* impacts to land use would occur, and no mitigation is proposed.

Factor 2: Consistency with Land Use Plans and Policies

As with Alternative 1, upon completion of the BRAC disposal process, HPS would fall under the jurisdiction of the city, which would be responsible for providing municipal services and administration of the project site. The major federal, state, and local land use plans and policies applicable to the reuse of HPS under Alternative 2 are the same as those discussed in Section 4.4.2.1.2, Operational Impacts, under Alternative 1. In addition, the consistency analysis described for Alternative 1 (Section 4.4.2.1.2) is applicable to the reuse of HPS under Alternative 2. Alternative 2, Tower Variant D, and the Building Preservation option for Alternative 2 would generally be consistent with the objectives and goals of applicable federal, state, and local plans and policies, including the recently amended HPS Redevelopment Plan, HPS Area Plan, General Plan, and Planning Code. However, similar to Alternative 1, this alternative would be inconsistent with various land use designations contained in the HPS Phase II Public Trust Lands and Bay Trail Plan. Implementation of Alternative 2 would require an amendment to the Bay Trail Plan to accommodate the new, improved alignment. Following such amendment, this alternative would be consistent with the Bay Trail Plan. In addition, following implementation of the trust exchange agreement approved as part of Alternative 2, trust lands would be configured substantially as shown on the trust map included in Senate Bill 792. Project uses in Alternative 2 for trust lands (as configured under the trust exchange agreement) would be consistent with the public trust and other applicable statutory requirements.

As with Alternative 1, Alternative 2 would be mostly compatible with the objectives and policies of the Bay Plan and Seaport Plan. This alternative involves minimal filling associated with construction of a bridge; construction of a marina; and improvement of the existing shoreline, waterfront bulkhead, piers, and seawall structures. Alternative 2 would provide improved access to the shoreline through shoreline improvements, open spaces, and a waterfront promenade.

The same as Alternative 1, Alternative 2 proposes land uses (public and recreation) within a 55-ac (22-ha) area, located within HPS parcels D-1 and E, which are inconsistent with the existing Bay Plan, Seaport Plan, and the previous 1999 Consistency Determination that designate this area as "Port" Priority Use. No other HPS parcel or proposed land uses affect a priority use area or are inconsistent with the goals and policies of the Bay Plan or Seaport Plan.

As discussed in Section 3.4.2.2.2, Bay Conservation and Development Commission, and the analysis of Factor 2, Consistency with Land Use Plans and Policies, in Section 4.4.2.1.2, the City and County of San Francisco is currently seeking an amendment to the Bay Plan and Seaport Plan to delete the "Port" Priority Use and marine terminal designations from the HPS property, and make conforming changes to the Bay Plan and Seaport Plan maps, map notes, policies and tables (BCDC 2011). Following such amendment, Alternative 2 would be consistent with the Bay Plan and Seaport Plan. Prior to the transfer of parcels D-1 and E, the DoN would review and, if necessary, provide BCDC with a consistency determination that may be required by the CZMA. DoN has coordinated with BCDC regarding this approach and documentation of this coordination is located in Appendix F.

Following disposal from federal ownership, the HPS property would be within the BCDC's jurisdiction and the future property owner and/or developer of the property would be required to obtain any applicable BCDC permits and other local, state, and federal approvals prior to implementing the 2010 Reuse Plan.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 2 would not result in a substantial change to the existing land use character. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Factor 3: Change to the Existing Land Use Character

As with Alternative 1, Alternative 2 would remove most of the large, vacant industrial and administrative buildings existing at HPS as well as develop the project site where buildings have already been cleared. Under Alternative 2, the built environment of HPS would be more densely developed than under existing conditions. The redevelopment would introduce new and active land uses to the property, including residential uses, R&D uses, regional and neighborhood retail uses, and public open space. Full build-out of Alternative 2 would provide the land area to develop a maximum of 2,650 residential units, over 125,000 ft^2 (11,613 m^2) of neighborhood retail, 5,000,000 ft^2 (464,515 m^2) of R&D, 255,000 ft^2 (23,690 m^2) of artists' studios and art center, 50,000 ft^2 (4,645 m^2) of community services, approximately 222 ac (90 ha) of parks and open space, a 300-slip marina, and the Yosemite Slough bridge (Table 2.3-13). Alternative 2 would retain certain structures, piers, drydocks, and the prominent Re-Gunning Crane. This alternative would extend the existing street grid and block pattern into HPS. The open space network would connect to the shoreline to the north and south. The land uses proposed under Alternative 2 would be allowed under existing land use and zoning plans, policies, and regulations.

Reuse of HPS as proposed under Alternative 2 would alter the existing land use character at HPS by converting the currently underutilized land uses within the project site to productive mixed-uses; retain artists; provide infrastructure improvements and community services; provide public parks, open space, and recreational facilities; and create economic growth. As such, Alternative 2 would improve the existing land use character at HPS and would result in a beneficial impact. Planned land use changes and the potential intensification of use within HPS under Alternative 2 would fulfill major objectives and policies of the HPS Redevelopment Plan and would be considered *not significant*.

Land uses and zoning in the project vicinity are guided by the BVHP Area Plan and the *Candlestick Point Subarea Plan* as well as the General Plan and the Planning Code. Alternative 2 would not directly impact land uses in the project vicinity since the proposed development would be located within HPS.

Development under Alternative 2 would contrast with the existing land use character and patterns in the project vicinity. The scale of development in the project vicinity ranges from two-story residential structures to larger scale warehouse and light-industrial structures. Alternative 2 would include R&D uses and two residential towers ranging from 270 to 370 ft (83.3 to 113 m) in height. These land uses would be different from and noticeable to residents and businesses in the project vicinity. In areas within the HPS North and HPS South districts, the planned open space would serve as a buffer between existing offsite and proposed onsite land uses. In addition, the land use pattern within the project site would transition from lower-density residential uses near existing neighborhoods to higher-density residential and R&D uses toward the waterfront of the project site (Figure 2.3-25). The juxtaposition of onsite uses and uses in the project vicinity would not be significant due this buffering and transition in density, scale, and uses. As such, Alternative 2 would be not result in a substantial adverse change in the existing land use character at the project site or vicinity. Rather, Alternative 2 would improve the existing land use conditions, a beneficial impact. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

The potential for Alternative 2 to contribute to secondary or indirect land use effects, such as adverse effects on retail or residential uses beyond the project site, are discussed in Section 4.6, Socioeconomics, under Factor 2 (Displacement of Housing) and Factor 3 (Displacement of Business), and Section 6.5.5.5.1, Socioeconomics, of the Environmental Justice analysis.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 2 would not result in a substantial change to the existing land use character. Rather, this option would preserve aspects of the existing character of the site. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

4.4.4.2 Recreation

Alternative 2 includes the construction of 222.2 ac (89.92 ha) of new parks, recreational facilities, and open space. The specific new parks, recreational facilities, and open space planned under Alternative 2 are discussed in Section 2.3.2.3.2, Parks and Open Space, and identified in Table 2.3-15 and Figure 2.3-28. This alternative would include the same new parks and open space facilities as proposed under Alternative 1 as well as two additional parks, Hunters Point Wedge Park and Hunters Point Park Blocks. In addition, Alternative 2 would reconfigure the design and sizes of the parks and open space areas at HPS compared to Alternative 1, and the area used under Alternative 1 for sports fields and for game day parking would solely be used for sports.

4.4.4.2.1 Factor 1: Construction Impacts

Alternative 2 includes the construction of 222.2 ac (89.92 ha) of new parks, recreational facilities, and open space at HPS, which is 9.4 ac (3.8 ha) less parkland compared to Alternative 1. Under Alternative 2, construction activities would occur during a similar build-out period and involve similar activities as Alternative 1. Construction of Alternative 2 and Tower Variant D of Alternative 2 would not impact existing public parks, recreational facilities, and open space because none currently exist at HPS. Consequently, *no significant* construction impacts on parks, recreational facilities, and open space would occur, and no mitigation is proposed.

4.4.4.2.2 Operational Impacts

Factor 2: Degradation or Deterioration of Existing Parks and Recreational Facilities

Alternative 2 would provide substantial new parks, recreational facilities, and open space within the project site and provide long-term funding for operation and maintenance of these facilities. No public parks, recreational facilities, and/or open space currently exist at HPS. As such, *no significant* operational impacts on existing parks, recreational facilities, and open space would occur, and no mitigation is proposed. Rather, the addition of these new park and open space facilities would be a beneficial impact.

Alternative 2 would provide unrestricted public access to recreational facilities at the project site. Additionally, the project would provide connectivity between the recreational facilities proposed at the project site and facilities in the project vicinity, and would allow integration of new and existing facilities into the citywide park network. This is a beneficial impact. Therefore, *no significant* operational impacts on existing offsite parks, recreational facilities, and open space would occur, and no mitigation is proposed.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 2 would not result in additional jobs, residents, parks, recreational facilities, or open space beyond that proposed for Alternative 2. Therefore, *no significant* operational impacts on existing parks, recreational facilities, and open space would occur, and no mitigation is proposed.

4.4.5 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

4.4.5.1 Land Use

Land uses for Alternative 2A are discussed in Section 2.3.2.4, Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative, and shown on Figure 2.3-31. The land uses proposed under Alternative 2A would be similar to Alternative 1; however, the stadium would not be constructed within HPS South district. Instead, additional residential and R&D land uses would be developed in the HPS South district.

4.4.5.1.1 Factors 1 through 3: Construction Impacts

Construction of Alternative 2A and Tower Variant D and the Building Preservation option for Alternative 2A would not contribute to the physical division of an established community by constructing physical barriers or obstacles to circulation. In addition, construction would be designed and sited to be compatible with the applicable federal, state, and local land use guidelines, planning documents, and regulations. Therefore, *no significant* construction impacts on land use would occur, and no mitigation is proposed.

4.4.5.1.2 Operational Impacts

Factor 1: Physical Division of an Established Community

Upon full build-out of Alternative 2A, approximately 861 ac (348 ha) of federal land would be integrated into the city, of which 421 ac (170 ha) would be made available for redevelopment. Alternative 2A proposes infill development centered on nodes of commercial and retail activity at HPS with no physical divisions. As with Alternative 1, Alternative 2A would redevelop currently underutilized parcels. Residential and non-residential infill around the nodes of activity would provide a more continuous land use pattern and street grid, provide new services and community amenities in the project vicinity, allow better access to existing offsite parks and recreational facilities, and remove existing barriers to circulation and access. As such, Alternative 2A would not physically divide an established community; rather it would integrate HPS into the surrounding community. This is considered a beneficial impact. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 2A would not cause a physical division of an established community. *No significant* impacts to land use would occur, and no mitigation is proposed.

Factor 2: Consistency with Land Use Plans and Policies

As with Alternative 1, upon completion of the BRAC disposal process, HPS would fall under the jurisdiction of the city, which would be responsible for providing municipal services and administration of the project site. Applicable plans that direct or regulate development on the project site are the same as those discussed in Section 4.4.2.1.2, Operational Impacts, under Alternative 1. The operational impacts to land use with respect to consistency with applicable land use plans and policies would be the same as those identified for Alternative 1. Alternative 2A and Tower Variant D and the Building Preservation option for Alternative 2A would be generally consistent with goals and objectives of most applicable federal, state, and local plans, including the recently amended HPS Redevelopment Plan, HPS Area Plan, General Plan, and Planning Code. However, similar to Alternative 1, this alternative would be inconsistent with various land use designations contained in the HPS Phase II Public Trust Lands and Bay Trail Plan. Implementation of Alternative 2A would require an amendment to the Bay Trail Plan to accommodate the new, improved alignment. Following such amendment, this alternative would be consistent with the Bay Trail Plan. In addition, following implementation of the trust exchange agreement approved as part of Alternative 2A, trust lands would be configured substantially as shown on the trust map included in Senate Bill 792. Project uses in Alternative 2A for trust lands (as configured under the trust exchange agreement) would be consistent with the public trust and other applicable statutory requirements.

As with Alternative 1, Alternative 2A would be mostly compatible with the objectives and policies of the Bay Plan and Seaport Plan. This alternative involves minimal filling associated with a construction of a bridge; construction of a marina; and improvement of the existing shoreline, waterfront bulkhead, piers, and seawall structures. Alternative 2A includes improved access to the shoreline through shoreline improvements, open spaces, and a waterfront promenade.

The same as Alternative 1, Alternative 2A proposes land uses (public and recreation) within a 55-ac (22-ha) area, located within HPS parcels D-1 and E, which are inconsistent with the existing Bay Plan, Seaport Plan, and the previous 1999 Consistency Determination that designate this area as “Port” Priority Use. No other HPS parcel or proposed land uses affect a priority use area or are inconsistent with the goals and policies of the Bay Plan or Seaport Plan.

As discussed in Section 3.4.2.2.2, Bay Conservation and Development Commission, and the analysis of Factor 2, Consistency with Land Use Plans and Policies, in Section 4.4.2.1.2, the City and County of San Francisco is currently seeking an amendment to the Bay Plan and Seaport Plan to delete the “Port” Priority Use and marine terminal designations from the HPS property, and make conforming changes to the Bay Plan and Seaport Plan maps, map notes, policies and tables (BCDC 2011). Following such amendment, Alternative 2A would be consistent with the Bay Plan and Seaport Plan. Prior to the transfer of parcels D-1 and E, the DoN would review and, if necessary, provide BCDC with a consistency determination that may be required by the CZMA. DoN has coordinated with BCDC regarding this approach and documentation of this coordination is located in Appendix F.

Following disposal from federal ownership, the HPS property would be within the BCDC's jurisdiction and the future property owner and/or developer of the property would be required to obtain any applicable BCDC permits and other local, state, and federal approvals prior to implementing the 2010 Reuse Plan.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 2A would not result in a substantial change to the existing land use character. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Factor 3: Change to the Existing Land Use Character

Under Alternative 2A, the built environment of HPS would be more densely developed than under existing conditions. The redevelopment would introduce new and active land uses to the property, including residential uses, R&D uses, regional and neighborhood retail uses, and public open space.

This alternative would remove most of the large, vacant industrial and administrative buildings existing at HPS as well as develop the project site where buildings have already been cleared. Full build-out of Alternative 2A would provide the land area to develop a maximum of 4,275 residential units, over 125,000 ft^2 (11,613 m^2) of neighborhood retail, 3,000,000 ft^2 (278,709 m^2) of R&D, 255,000 ft^2 (23,690 m^2) of artists' studios and art center, 50,000 ft^2 (4,645 m^2) of community services, approximately 222 ac (90 ha) of parks and open space, a 300-slip marina, and the Yosemite Slough bridge (Table 2.3-16). Alternative 2A would retain certain structures, piers, drydocks, and the prominent Re-Gunning Crane. This alternative would extend the existing street grid and block pattern into HPS. The open space network would connect to the shoreline to the north and south. The land uses proposed under Alternative 2A would be allowed under existing land use and zoning plans, policies, and regulations.

Reuse of HPS as proposed under Alternative 2A would alter the existing land use character at HPS by converting the currently underutilized land uses within the project site to productive mixed-uses; retain artists; provide infrastructure improvements and community services; provide public parks, open space, and recreational facilities; and create economic growth. As such, Alternative 2A would improve the existing land character at HPS and would result in a beneficial impact. Planned land use changes and the potential intensification of use within HPS under Alternative 2A would fulfill major objectives and policies of the HPS Redevelopment Plan and would be considered *not significant*.

Land uses and zoning in the project vicinity are guided by the BVHP Area Plan and the Candlestick Point Subarea Plan as well as the General Plan and the Planning Code. Alternative 2A would not directly impact land uses in the project vicinity since the proposed development would be located within HPS. However, Alternative 2A would contrast with the existing land use character and patterns in the project vicinity. The scale of nearby development ranges from two-story residential structures to larger scale warehouse and light-industrial structures. For example, Alternative 1 would include R&D uses and two residential towers ranging from 270 to 370 ft (83.3 to 113 m) in height. These land uses would be different from and be noticeable to residents and businesses in the project vicinity. In the areas within the HPS North and HPS South districts, the planned open space would serve as a buffer between existing offsite and proposed onsite land uses. In addition, the land use pattern within the project site would transition from lower-density residential uses near existing neighborhoods to higher-density residential and R&D uses toward the waterfront of the project site (Figure 2.3-30). The juxtaposition of onsite uses and uses in the project vicinity would not be significant due to this buffering and transition in density, scale, and uses. Therefore, Alternative 2A would not result in a substantial adverse change in the existing land use character at the project site or vicinity. Rather, this alternative would improve the existing land use conditions, a beneficial impact. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

The potential for Alternative 2A to contribute to secondary or indirect land use effects, such as adverse effects on retail or residential uses beyond the project site, are discussed in Section 4.6, Socioeconomics, under Factor 2 (Displacement of Housing) and Factor 3 (Displacement of Business), and Section 6.5.5.5.1, Socioeconomics, of the Environmental Justice analysis.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 2A would not result in a substantial change to the existing land use character. Rather, this option would preserve aspects of the existing character of the site. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

4.4.5.2 Recreation

Alternative 2A would include a total of 221.8 ac (89.76 ha) of new parks, recreational facilities, and open space, including 150.9 ac (61.07 ha) of parkland and 70.9 ac (28.7 ha) of sports field and active urban recreation areas. This is 9.8 ac (3.9 ha) less parkland than Alternative 1. This alternative would include additional parks (Hunters Point Wedge Park, Hunters Point South Park, Hunters Point Neighborhood Park, and Hunters Point Mini Park) and would reconfigure the design and sizes of parks and open space at HPS compared to Alternative 1. Each of the parks and their respective acreage is listed in Table 2.3-18. Figure 2.3-32 illustrates the location of the proposed parks and open space.

4.4.5.2.1 Factor 1: Construction Impacts

Construction of Alternative 2A, Tower Variant D, and the Building Preservation option for Alternative 2A would not impact existing public parks, recreational facilities, and open space because none currently exist at HPS. Consequently, *no significant* construction impacts on recreation would occur, and no mitigation is required.

4.4.5.2.2 Operational Impacts

Factor 2: Degradation or Deterioration of Existing Parks and Recreational Facilities

Alternative 2A would provide substantial new parks, recreational facilities, and open space within the project site and provide long-term funding for operation and maintenance of these facilities. No public parks, recreational facilities, or open space currently exist at HPS. As such, *no significant* operational impacts on existing onsite parks, recreational facilities, and open space would occur, and no mitigation is proposed. Rather, the addition of these new park and open space facilities would be a beneficial impact.

Alternative 2A would provide a network of pedestrian and bike pathways that would connect proposed onsite uses to the adjacent neighborhoods and would ensure unrestricted public access to the parks and open space on the project site and the bay shoreline. Enhanced connectivity of onsite and offsite facilities and new neighborhood parks would allow integration of new and existing facilities into the citywide park network. The proposed bicycle and pedestrian pathways would facilitate dispersal of future demand, which would help to reduce the potential for localized physical deterioration. The improved connectivity would also direct regional users (i.e., users who live within the region but not specifically on the project site) to proposed “destination” parks (i.e., parks designed to accommodate regional demand). In addition, Alternative 3 would provide a continuous series of waterfront parks throughout the project site connecting to Candlestick Point. This is a beneficial impact. Therefore, *no significant* operational impacts on existing offsite parks, recreational facilities, and open space would occur, and no mitigation is proposed.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 2A would not result in the degradation or deterioration of existing parks and recreational facilities because no additional residents, jobs, parks, recreational facilities, or open space would be created beyond that proposed for Alternative 2A. Therefore, *no significant* construction impacts on parks, recreational facilities, and open space would occur, and no mitigation is proposed.

4.4.6 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

4.4.6.1 Land Use

Land uses for Alternative 3 are discussed in Section 2.3.2.5.1, Alternative 3: Non-Stadium Plan/Additional Housing Alternative, and shown on Figure 2.3-34. The land uses proposed under Alternative 3 would be similar to Alternative 1 in each district with the exception of the HPS South district where the stadium proposed under Alternative 1 would be replaced with additional residential and neighborhood commercial land uses.

4.4.6.1.1 Factors 1 through 3: Construction Impacts

Construction of Alternative 3, Tower Variant D, and the Building Preservation option for Alternative 3 would not contribute to the physical division of an established community by constructing physical barriers or obstacles to circulation. In addition, construction would be designed and sited to be compatible with the applicable federal, state, and local land use guidelines, planning documents, and regulations. Therefore, *no significant* construction impacts on land use would occur, and no mitigation is proposed.

4.4.6.1.2 Operational Impacts

Factor 1: Physical Division of an Established Community

Upon full build-out of Alternative 3, approximately 861 ac (348 ha) of federal land would be integrated into the city, of which 421 ac (170 ha) would be made available for redevelopment. As with Alternative 1, Alternative 3 would redevelop currently underutilized parcels. Alternative 3 proposes infill development, centered on nodes of commercial and retail activity at HPS with no physical divisions. Residential and non-residential infill around these nodes of activity would provide a more continuous land use pattern and street grid, provide new services and community amenities in the project vicinity, allow better access to existing offsite parks and recreational facilities, and remove existing barriers to circulation and access. As such, Alternative 3 would not physically divide an established community; rather it would integrate HPS into the surrounding community. This is considered a beneficial impact. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 3 would not cause a physical division of an established community. *No significant* impacts to land use would occur, and no mitigation is proposed.

Factor 2: Consistency with Land Use Plans and Policies

As with Alternative 1, upon completion of the BRAC disposal process, HPS would fall under the jurisdiction of the city, which would be responsible for providing municipal services and administration of the project site. Applicable plans that direct or regulate development on the project site are the same as those discussed in Section 4.4.2.1.2, Operational Impacts, under Alternative 1. Alternative 3 and Tower Variant D and the Building Preservation option for Alternative 3 would generally be consistent with the objectives and goals of applicable land use plans and policies, including the recently amended HPS Redevelopment Plan, HPS Area Plan, General Plan, and Planning Code. However, similar to Alternative 1, this alternative would be inconsistent with various land use designations contained in the HPS Phase II Public Trust Lands and Bay Trail Plan. Implementation of Alternative 3 would require an amendment to the Bay Trail Plan to accommodate the new, improved alignment. Following such amendment, this alternative would be consistent with the Bay Trail Plan. In addition, following implementation of the trust exchange agreement approved as part of Alternative 3, trust lands would be configured substantially as shown on the trust map included in Senate Bill 792. Project uses in Alternative 3 for trust lands (as configured under the trust exchange agreement) would be consistent with the public trust and other applicable statutory requirements.

As with Alternative 1, Alternative 3 would be mostly compatible with the objectives and policies of the Bay Plan and Seaport Plan. This alternative involves minimal filling associated with a construction of a bridge; construction of a marina; and improvement of the existing shoreline, waterfront bulkhead, piers, and seawall structures. Alternative 3 includes improved access to the shoreline through shoreline improvements, open spaces, and a waterfront promenade.

The same as Alternative 1, Alternative 3 proposes land uses (public and recreation) within a 55-ac (22-ha) area, located within HPS parcels D-1 and E, which are inconsistent with the existing Bay Plan, Seaport Plan, and the previous 1999 Consistency Determination that designate this area as "Port" Priority Use. No other HPS parcel or proposed land uses affect a priority use area or are inconsistent with the goals and policies of the Bay Plan or Seaport Plan.

As discussed in Section 3.4.2.2.2, Bay Conservation and Development Commission, and the analysis of Factor 2, Consistency with Land Use Plans and Policies, in Section 4.4.2.1.2, the City and County of San Francisco is currently seeking an amendment to the Bay Plan and Seaport Plan to delete the "Port" Priority Use and marine terminal designations from the HPS property, and make conforming changes to the Bay Plan and Seaport Plan maps, map notes, policies, and tables (BCDC 2011). Following such amendment, Alternative 3 would be consistent with the Bay Plan and Seaport Plan. Prior to the transfer of parcels D-1 and E, the DoN would review and, if necessary, provide BCDC with a consistency determination that may be required by the CZMA. DoN has coordinated with BCDC regarding this approach and documentation of this coordination is located in Appendix F.

Following disposal from federal ownership, the HPS property would be within the BCDC's jurisdiction and the future property owner and/or developer of the property would be required to obtain any applicable BCDC permits and other local, state, and federal approvals prior to implementing the 2010 Reuse Plan. Therefore, *no significant* operational impacts on land use plans, policies, or regulations would occur, and no mitigation is proposed.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 3 would not result in a substantial change to the existing land use character. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Factor 3: Change to the Existing Land Use Character

This alternative would remove most of the large, vacant industrial and administrative buildings existing at HPS as well as develop the project site where buildings have already been cleared. Under Alternative 3, the built environment of HPS would be more densely developed than under existing conditions. The redevelopment would introduce new and active land uses to the property, including regional and neighborhood retail uses, and public open space. This alternative would extend the existing street grid and block pattern into HPS. The open space network would connect to the shoreline to the north and south.

Full build-out of Alternative 3 would provide the land area to develop a maximum of 4,000 residential units, over 125,000 ft^2 (11,613 m^2) of neighborhood retail, 2,500,000 ft^2 (232,258 m^2) of R&D, 255,000 ft^2 (23,690 m^2) of artists' studios and art center, 50,000 ft^2 (4,645 m^2) of community services, approximately 245 ac (99 ha) of parks and open space, a 300-slip marina, and the Yosemite Slough bridge (Table 2.3-13). Alternative 3 would retain certain structures, piers, drydocks, and the prominent Re-Gunning Crane. This alternative would extend the existing street grid and block pattern into HPS. The open space network would connect to the shoreline to the north and south. The land uses proposed under Alternative 3 would be allowed under existing land use and zoning plans, policies, and regulations.

Reuse of HPS as proposed under Alternative 3 would alter the existing land use character at HPS by converting the currently underutilized land uses within the project site to productive mixed-uses; retain artists; provide infrastructure improvements and community services; provide public parks, open space, and recreational facilities; and create economic growth. As such, Alternative 3 would improve the existing land character at HPS and would result in a beneficial impact. Planned land use changes and the potential intensification of use within HPS under Alternative 3 would fulfill major objectives and policies of the HPS Redevelopment Plan and would be considered *not significant.*

Land uses and zoning in the project vicinity are guided by the BVHP Area Plan and the Candlestick Point Subarea Plan as well as the General Plan and the Planning Code. Alternative 3 would not directly impact land uses in the project vicinity since the proposed development would be located within HPS.

Development under Alternative 3 would contrast with the existing land use character and patterns in the project vicinity. The scale of nearby development in the project vicinity ranges from two-story residential structures to larger scale warehouse and light-industrial structures. Alternative 3 would include R&D uses and two residential towers ranging from 270 to 370 ft (83.3 to 113 m) in height. These land uses would be different from and be noticeable to residents and businesses in the project vicinity. In the areas within the HPS North and HPS South districts, the planned open space would serve as a buffer between existing offsite and proposed onsite land uses. In addition, the land use pattern within the project site would transition from lower-density residential uses near existing neighborhoods in the project vicinity to higher-density residential and R&D uses towards the waterfront of the project site (Figure 2.3-35). The juxtaposition of onsite uses and uses in the project vicinity would not be significant due this buffering and transition in density, scale, and uses. Therefore, Alternative 3 would not result in a substantial adverse change in the existing land use character at the project site or vicinity. Rather, this alternative would improve the existing land use conditions, a beneficial impact. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

The potential for Alternative 3 to contribute to secondary or indirect land use effects, such as adverse effects on retail or residential uses beyond the project site, are discussed in Section 4.6, Socioeconomics, under Factor 2 (Displacement of Housing) and Factor 3 (Displacement of Business), and Section 6.5.5.5.1, Socioeconomics, of the Environmental Justice analysis.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 3 would not result in a substantial change to the existing land use character. Rather, this option would preserve aspects of the existing character of the site. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

4.4.6.2 Recreation

The specific new parks, recreational facilities, and open space planned under Alternative 3 are discussed in Section 2.3.2.5.1, Parks and Open Space, and identified in Table 2.3-21 and Figure 2.3-36. This alternative would include a total of 244.6 ac (98.99 ha) of new recreational facilities including 149.9 ac (60.66 ha) of parkland and 94.7 ac (38.3 ha) of sports field and active urban recreation areas, which is approximately 13 ac (5.3 ha) more parkland than Alternative 1.

4.4.6.2.1 Factor 1: Construction Impacts

Construction of Alternative 3, Tower Variant D, and the Building Preservation option for Alternative 3 would not impact existing public parks, recreational facilities, and open space because none currently exist at HPS. Consequently, *no significant* construction impacts on recreation would occur, and no mitigation is required.

4.4.6.2.2 Operational Impacts

Factor 2: Degradation or Deterioration of Existing Parks and Recreational Facilities

Alternative 3 would provide substantial new parks, recreational facilities, and open space within the project site and provide long-term funding for operation and maintenance of these facilities. No public parks, recreational facilities, or open space currently exist at HPS. Consequently, *no significant* operational impacts on existing onsite parks, recreational facilities, and open space would occur, and no mitigation is proposed. Rather, the addition of these new park and open space facilities would be a beneficial impact.

Alternative 3 would provide a network of pedestrian and bike pathways that would connect proposed onsite uses to the adjacent neighborhoods and would ensure unrestricted public access to the parks and open space on the project site and the bay shoreline. Enhanced connectivity of onsite and offsite facilities and new neighborhood parks would allow integration of new and existing facilities into the citywide park network. The proposed bicycle and pedestrian pathways would facilitate dispersal of future demand, which would help to reduce the potential for localized physical deterioration. The improved connectivity would also direct regional users (i.e., users who live within the region but not specifically on the project site) to proposed "destination" parks (i.e., parks designed to accommodate regional demand). In addition, Alternative 3 would provide a continuous series of waterfront parks throughout the project site connecting to Candlestick Point. This is a beneficial impact. Therefore, *no significant* operational impacts on existing offsite parks, recreational facilities, and open space would occur, and no mitigation is proposed.

Minor changes associated with operation of Tower Variant D and the Building Preservation option for Alternative 3 would not result in the degradation or deterioration of existing parks and recreational facilities because no additional residents, jobs, parks, recreational facilities, or open space would be created beyond that proposed for Alternative 3. Therefore, *no significant* construction impacts on parks, recreational facilities, and open space would occur, and no mitigation is proposed.

4.4.7 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

4.4.7.1 Land Use

Land uses for Alternative 4 are discussed in Section 2.3.2.6.1, Land Use, and shown on Figure 2.3-38. The land uses proposed under Alternative 4 would be similar to Alternative 1; however, residential and non-residential land uses would be decreased by 30 percent compared to Alternative 1. In addition, the stadium, marina, shoreline improvements associated with the marina, and the Yosemite Slough bridge would not be constructed under this alternative.

4.4.7.1.1 Factors 1 through 3: Construction Impact

Construction of Alternative 4 would not contribute to the physical division of an established community by constructing physical barriers or obstacles to circulation. In addition, construction would be designed and sited to be compatible with applicable federal, state, and local land use guidelines, planning documents, and regulations. Therefore, *no significant* construction impacts on land use would occur, and no mitigation is proposed.

4.4.7.1.2 Operational Impacts

Factor 1: Physical Division of an Established Community

Upon full build-out of Alternative 4, approximately 861 ac (348 ha) of federal land would be integrated into the city, of which 421 ac (170 ha) would be made available for redevelopment. Alternative 4 would redevelop currently underutilized parcels and proposes infill development, centered on nodes of commercial and retail activity at HPS with no physical divisions. Residential and non-residential infill around these nodes of activity would provide a more continuous land use pattern and street grid, provide new services and community amenities in the project vicinity, allow better access to existing offsite parks and recreational facilities, and remove existing barriers to circulation and access. Increased connectivity between the project site and project vicinity would be a beneficial impact. Alternative 1A would not physically divide an established community, and, therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Factor 2: Consistency with Land Use Plans and Policies

As with Alternative 1, upon completion of the BRAC disposal process, HPS would fall under the jurisdiction of the city, which would be responsible for providing municipal services and administration of the project site. Applicable plans and policies that direct or regulate development on the project site are the same as those discussed in Section 4.4.2.1.2, Operational Impacts, under Alternative 1.

Alternative 4 would generally be consistent with the objectives and goals of applicable land use plans and policies, including the recently amended HPS Redevelopment Plan, HPS Area Plan, General Plan, and Planning Code. However, similar to Alternative 1, this alternative would be inconsistent with various land use designations contained in the HPS Phase II Public Trust Lands and Bay Trail Plan. Implementation of Alternative 4 would require an amendment to the Bay Trail Plan to accommodate the new, improved alignment. Following such amendment, this alternative would be consistent with the Bay Trail Plan. In addition, following implementation of the trust exchange agreement approved as part of Alternative 4, trust lands would be configured substantially as shown on the trust map included in Senate Bill 792. Project uses in Alternative 4 for trust lands (as configured under the trust exchange agreement) would be consistent with the public trust and other applicable statutory requirements.

As with Alternative 1, Alternative 4 would be mostly compatible with the objectives and policies of the Bay Plan and Seaport Plan. This alternative involves minimal filling associated with improvement of the existing shoreline, waterfront bulkhead, piers, and seawall structures. Alternative 4 would provide improved access to the shoreline through shoreline improvements, open spaces, and a waterfront promenade.

The same as Alternative 1, Alternative 4 proposes land uses (public and recreation) within a 55-ac (22-ha) area, located within HPS parcels D-1 and E, which are inconsistent with the existing Bay Plan, Seaport Plan, and the previous 1999 Consistency Determination that designate this area as "Port" Priority Use. No other HPS parcel or proposed land uses affect a priority use area or are inconsistent with the goals and policies of the Bay Plan or Seaport Plan.

As discussed in Section 3.4.2.2.2, Bay Conservation and Development Commission, and the analysis of Factor 2, Consistency with Land Use Plans and Policies, in Section 4.4.2.1.2, the City and County of San Francisco is currently seeking an amendment to the Bay Plan and Seaport Plan to delete the "Port" Priority Use and marine terminal designations from the HPS property, and make conforming changes to the Bay Plan and Seaport Plan maps, map notes, policies and tables (BCDC 2011). Following such amendment, Alternative 4 would be consistent with the Bay Plan and Seaport Plan. Prior to the transfer of parcels D-1 and E, the DoN would review and, if necessary, provide BCDC with a consistency determination that may be required by the CZMA. DoN has coordinated with BCDC regarding this approach and documentation of this coordination is located in Appendix F.

Following disposal from federal ownership, the HPS property would be within the BCDC's jurisdiction and the future property owner and/or developer of the property would be required to obtain any applicable BCDC permits and other local, state, and federal approvals prior to implementing the 2010 Reuse Plan. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

Factor 3: Change to the Existing Land Use Character

Under Alternative 4, the built environment of HPS would be more densely developed than under existing conditions. The redevelopment would introduce new and active land uses to the property, including residential uses, R&D uses, regional and neighborhood retail uses, and public open space. This alternative would extend the existing street grid and block pattern into the project site. The open space network would be extended to connect to the shoreline to the north and south of the project site.

Alternative 4 would remove most of the large, vacant industrial and administrative buildings existing at HPS as well as develop the project site where buildings have already been cleared. Full build-out of Alternative 4 would provide the land area to develop a maximum of 1,855 residential units, 87,500 ft^2 (8,129 m^2) of neighborhood retail, 1,700,000 ft^2 (157,935 m^2) of R&D, 255,000 ft^2 (23,690 m^2) of artists' studios and art center, 50,000 ft^2 (4,645 m^2) of community services, and approximately 245 ac (99 ha) of parks and open space (Table 2.3-22). Alternative 4 would retain certain structures, piers, drydocks, and the prominent Re-Gunning Crane. This alternative would extend the existing street grid and block pattern into HPS. The open space network would connect to the shoreline to the north and south. The land uses proposed under Alternative 4 would be allowed under existing land use and zoning plans, policies, and regulations.

Reuse of HPS as proposed under Alternative 4 would alter the existing land use character at HPS by converting the currently underutilized land uses within the project site to productive mixed-uses; retain artists; provide infrastructure improvements and community services; provide public parks, open space, and recreational facilities; and create economic growth. As such, Alternative 4 would improve the existing land character at HPS and would result in a beneficial impact. Planned land use changes and the potential intensification of use within HPS under Alternative 4 would fulfill major objectives and policies of the HPS Redevelopment Plan and would be considered *not significant*.

Land uses and zoning in the project vicinity are guided by the BVHP Area Plan and the Candlestick Point Subarea Plan as well as the General Plan and the Planning Code. Alternative 4 would not directly impact land uses in the project vicinity since the proposed development would be located within HPS.

Development under Alternative 4 would contrast with the existing land use character and patterns in the project vicinity. The scale of nearby development ranges from two-story residential structures to larger scale warehouse and light-industrial structures. Alternative 4 would include residential and R&D uses. No residential towers would be developed under this alternative. These land uses would be noticeable to residents and businesses in the project vicinity. In areas within the HPS North and HPS South districts, the planned open space would serve as a buffer between existing offsite and proposed onsite land uses. In addition, the land use pattern within the project site would transition from lower-density residential uses near existing neighborhoods in the project vicinity to higher-density residential and R&D uses toward the waterfront of the project site (Figure 3.3-38). Due to buffering and transition in density, scale, and uses, the juxtaposition of proposed land uses at HPS and existing land uses in the project vicinity would not result in significant impacts to land use character. Rather, development of this alternative would improve the existing land use conditions, a beneficial impact. Therefore, *no significant* operational land use impacts would occur, and no mitigation is proposed.

The potential for Alternative 4 to contribute to secondary or indirect land use effects, such as adverse effects on retail or residential uses beyond the project site, are discussed in Section 4.6, Socioeconomics, under Factor 2 (Displacement of Housing) and Factor 3 (Displacement of Business), and Section 6.5.5.5.1, Socioeconomics, of the Environmental Justice analysis.

4.4.7.2 Recreation

Alternative 4 would include a total of 244.6 ac (98.99 ha) of new recreational facilities, including 149.9 ac (60.66 ha) of parkland and 94.7 ac (38.3 ha) of sports field and active urban recreation areas. This is approximately 13 ac (5.3 ha) more parkland than proposed under Alternative 1. The specific new parks, recreational facilities, and open space planned under Alternative 4 are discussed in Section 2.3.2.6.2, Parks and Open Space, and would be the same as those discussed for Alternative 3 as identified in Tables 2.3-17 and 2.3-18 and shown on Figure 2.3-36.

4.4.7.2.1 Factor 1: Construction Impact

Construction of Alternative 4 would not impact existing public parks, recreational facilities, and open space because none currently exist at HPS. Consequently, *no significant* construction impacts on parks, recreational facilities, and open space would occur, and no mitigation is proposed.

4.4.7.2.2 Operational Impact

Factor 2: Degradation or Deterioration of Existing Parks and Recreational Facilities

Alternative 4 would provide substantial new parks, recreational facilities, and open space within the project site and provide long-term funding for operation and maintenance of these facilities. No public parks, recreational facilities, and/or open space currently exist at HPS. As such, *no significant* operational impacts on existing parks, recreational facilities, and open space would occur, and no mitigation is proposed. Rather, the addition of these new park and open space facilities would be a beneficial impact.

Alternative 4 would provide a network of pedestrian and bike pathways that would connect proposed onsite uses to the adjacent neighborhoods and would ensure unrestricted public access to the parks and open space on the project site and the bay shoreline. Enhanced connectivity of onsite and offsite facilities and new neighborhood parks would allow integration of new and existing facilities into the citywide park network. The proposed bicycle and pedestrian pathways would facilitate dispersal of future demand, which would help to reduce the potential for localized physical deterioration. The improved connectivity would also direct regional users (i.e., users who live within the region but not specifically on the project site) to proposed “destination” parks (i.e., parks designed to accommodate regional demand). In addition, Alternative 1 would provide a continuous series of waterfront parks throughout the project site connecting to Candlestick Point. This is a beneficial impact. Therefore, *no significant* operational impacts on existing offsite parks, recreational facilities, and open space would occur, and no mitigation is proposed.

4.4.8 No Action Alternative

Under the No Action Alternative, HPS would remain a closed federal property under caretaker status and would not be reused or redeveloped, leaving the majority of the project site unused or underutilized. No new leases would be entered under the No Action Alternative. Existing leases would continue until they expire or are terminated. DoN could decide to renew or extend some or all of these leases, and environmental impacts associated with renewal or extension of existing leases would be evaluated before making such decisions. Since HPS would be retained by the federal government in caretaker status, local land use plans and regulations would not be enforceable at the project site.

4.4.8.1 Land Use

4.4.8.1.1 Factors 1 through 3: Construction Impact

Under the No Action Alternative, no construction would occur and existing conditions would remain as described in Section 3.4, Land Use and Recreation. Therefore, *no impacts* to land use would occur, and no mitigation is proposed.

4.4.8.1.2 Operational Impacts

Factor 1: Physical Division of an Established Community

Under the No Action Alternative, existing conditions would remain as described in Section 3.4, Land Use and Recreation. No reuse or redevelopment of the project site would occur. HPS would continue to operate as a federal facility in caretaker status with little physical connectivity to the surrounding community and limited public access. The artists’ studios and crime lab would remain as the only active uses at the project site leaving the majority of the project site unused or underutilized. Large undeveloped parcels and vacant buildings would continue to surround these uses, isolating them from uses in the project vicinity. *No significant* land use impacts would occur, and no mitigation is proposed. However, the beneficial impact

Factor 2: Consistency with Land Use Plans and Policies

Under the No Action Alternative, existing conditions would remain as described in Section 3.4, Land Use and Recreation, and HPS would continue to be owned by the federal government, outside the jurisdiction of the city. Thus, local land use plans and regulations would not be enforceable at the project site. *No impacts* to land use would occur.

Factor 3: Change to the Existing Land Use Character

Under the No Action Alternative, existing conditions would remain as described in Section 3.4, Land Use and Recreation, resulting in *no impacts* to land use. However, no beneficial reuse or redevelopment of the project site would occur, and approximately 861 ac (349 ha) of installation property would be left unused or underutilized.

4.4.8.2 Recreation

4.4.8.2.1 Factor 1: Construction Impacts

Under the No Action Alternative, no construction would occur and existing conditions would remain as described in Section 3.4, Land Use and Recreation. Therefore, *no impacts* to recreation would occur.

4.4.8.2.2 Operational Impacts

Factor 2: Degradation or Deterioration of Existing Parks and Recreational Facilities

Under the No Action Alternative, existing conditions would remain as described in Section 3.4, Land Use and Recreation. As no public recreational facilities currently exist at the project site, *no impacts* to recreation would occur. However, no beneficial reuse or redevelopment of the project site, including the development of approximately 220 ac (89 ha) to 245 ac (99 ha) of parks, open space, and recreational facilities, would occur under the No Action Alternative.

4.4.9 Mitigation

The proposed action and alternatives would not result in significant impacts to land use and recreation. No mitigation is proposed.

4.5 Visual Resources and Aesthetics

4.5.1 Methodology

4.5.1.1 Significance Factors

Factors considered in determining whether an alternative would have significant impacts on visual resources/aesthetics include the extent or degree to which the implementation of an alternative would:

Factor 1 Have a substantial adverse effect on a scenic vista;

Factor 2 Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and other features of the built or natural environment that contribute to a scenic public setting;

Factor 3 Substantially degrade the existing visual character or quality of the site and its surroundings; and/or

Factor 4 Create a new source of substantial light or glare that would adversely affect day or night views in the area or that would substantially impact other people or properties.

4.5.1.2 Analytic Method

4.5.1.2.1 Visual Resources

This analysis of potential visual resource/aesthetic effects of the alternatives was conducted using quantitative Federal Highway Administration (FHWA) Visual Impact Assessment and Bureau of Land Management (BLM) Visual Resource Management techniques to determine potential impacts in accordance with NEPA; CEQ regulations implementing NEPA (40 CFR 1500-1508); DoN regulations implementing NEPA (32 CFR 775); and BRAC Implementation Guidance.

FHWA Visual Impact Assessment requires that a project be assessed as to whether it affects the overall aesthetic character of a project site area, as well as the physical compatibility of a project with the site's existing visual quality (FHWA 1988). In order to objectively assess a project's impacts on visual quality, FHWA's framework requires characterization of the existing level of visual quality associated with the project setting in terms of the following variables (i.e., evaluative criteria):

- ***Vividness.*** Visual power (i.e., memorability) of landscape components. Vividness includes consideration of landforms and landcover (e.g., vegetation, water, and development);
- ***Intactness.*** Integrity of the natural or built environment and freedom from encroaching elements. Development could enhance or subtract from otherwise intact urban and pristine landscapes; and
- ***Unity.*** Visual coherence or harmony of individual landscape elements; compatibility. Although most landscapes exhibit a greater or lesser degree of unity between natural and built landscape elements, entirely natural landscapes and/or predominantly urban landscapes can be visually unified or chaotic.

When all three of these criteria are rated highly in a project setting, visual quality is accordingly considered to be high. However, a landscape setting determined to possess low visual quality may nonetheless be sensitive to project-related changes, and be negatively affected by or benefit from project additions to such qualities.

The BLM Visual Resource Management methodology employs the contrast rating system, a systematic process for the analysis of potential visual impacts of proposed actions and activities. This methodology assumes that the degree to which a project affects the visual quality of a landscape depends on the degree of contrast created between a project and existing landscape. Similar to FHWA visual attributes, the basic design elements of form, line, color, and texture are considered to make this comparison and to describe the visual contrast created by the project.

BLM's general guidance for assessing contrast is defined as follows (BLM 1978):

- ***Form.*** Contrast in form results from changes in the shape and mass of landforms or structures. The degree of change depends on how dissimilar the introduced forms are to those that remain in the landscape;
- ***Line.*** Contrasts in line result from changes in edge types and interruption or introduction of edges, bands, and silhouette lines. New lines may differ in their sub-elements (e.g., boldness, complexity, and orientation) from existing lines;
- ***Color.*** Changes in value and hue tend to create the greatest contrast. Other factors such as chroma (color saturation or brilliance), reflectivity, and color temperature (e.g., red is warm, blue is cold) also increase the contrast; and
- ***Texture.*** Noticeable contrast in texture usually stems from differences in the grain, density, and internal contrast. Other factors such as irregularity and directional patterns of texture may affect the rating.

This SEIS uses computer simulations to present representative views of the project site, and then systematically superimpose proposed architectural and landscape details to illustrate the potential change to the existing view. The view corridors represented by each of these simulated views are presented in Figure 4.5.1-1. The "Existing Views" in Figure 4.5.1-2 through Figure 4.5.1-11 serve as a background for super-imposing photo-simulations of proposed buildout. Each camera position was carefully recorded when the existing view was shot, including camera tilt perpendicular to targeting axis, camera compass bearing, position, and elevation. These data were then used to accurately superimpose project description details as presented in Chapter 2. It should be noted that these figures do not include already approved development, such as HPS Phase I (Parcel A) development (not part of the proposed action), which would increase the amount of development even more compared to that depicted in the photographs.

Conceptual building designs were placed in the existing view photos with conceptual structural heights as dictated by the proposed criteria. As structural colors and materials have not been specifically identified for the proposed structures, these details were reasonably projected based on local requirements, including City of San Francisco and BCDC design guidelines. Because the conceptual building designs are not meant to provide final architectural detail (this specificity would be presented in subsequent development and landscape plans throughout proposed buildout), the proposed simulations are meant to represent only the potential scale and massing of buildout. As landscape treatments addressing the location and types of species to be planted have not been specifically identified, these details were reasonably projected based on local design guidelines. The detailed design and landscape plans would be proposed as final design concepts are finalized.

In order to facilitate comparison and impact assessment, the proposed buildout computer-simulated "Proposed View" is indicated on Figure 4.5.1-2 through Figure 4.5.1-11 below the Existing View.

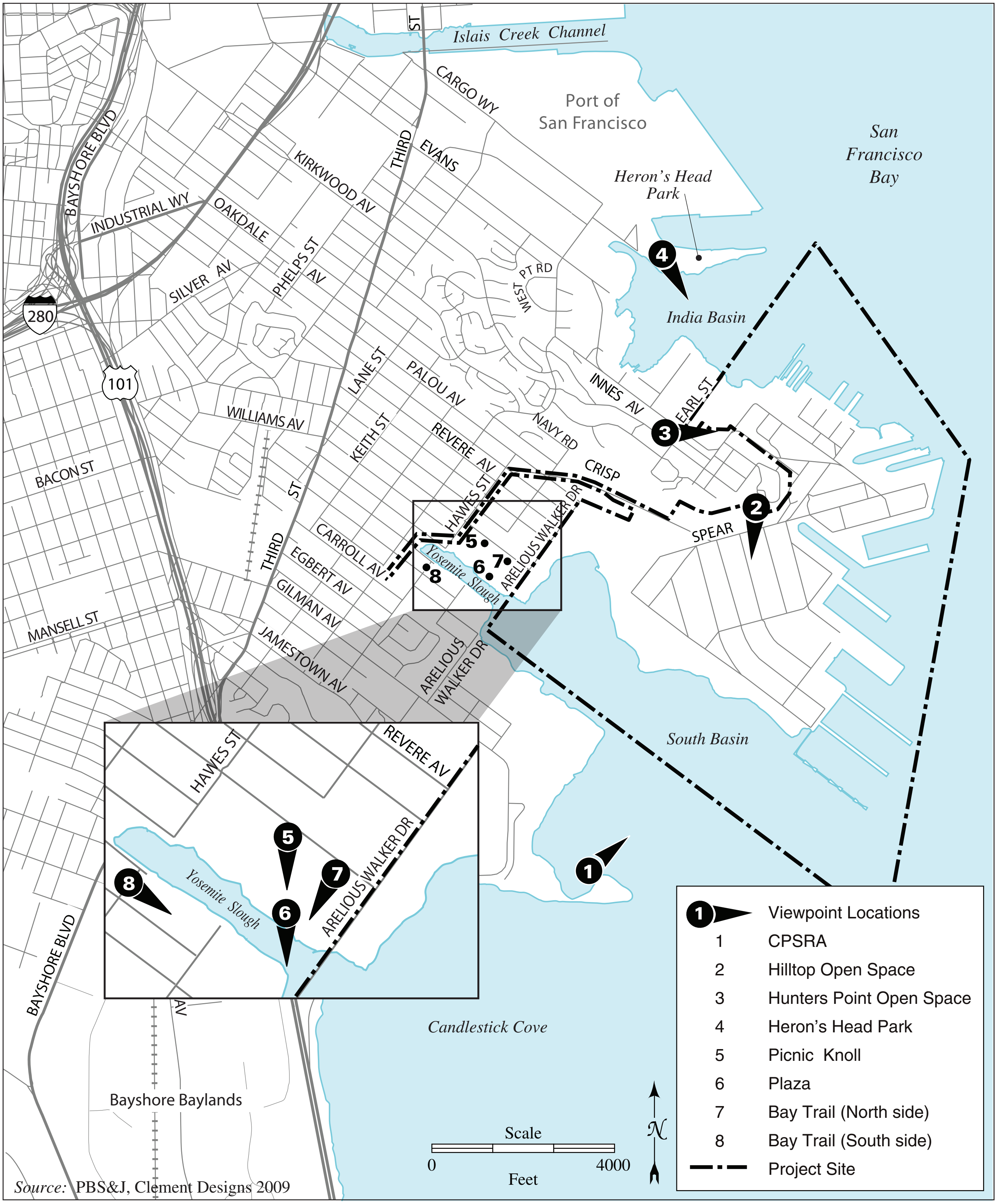


Figure 4.5.1-1. Viewpoint Locations

Existing

Proposed

Source: Lennar Urban 2009

Figure 4.5.1-2. Alternative 1: Northeast from CPSRA (View 1)

Existing

Proposed

Source: Lennar Urban 2009

Figure 4.5.1-3. Alternative 1: South from Hilltop Open Space (View 2)

Existing

Proposed

Source: Lennar Urban 2009

Figure 4.5.1-4. Alternative 1: East from Hunters Point Hill Open Space (View 3)

Existing

Proposed

Source: Lennar Urban 2009

Figure 4.5.1-5. Alternative 1: Southeast from Heron's Head Park (View 4)

View 5: South from Northside Picnic Knoll

View 6: Southeast from Northside Plaza

Source: RHAA; Endres Ware 2010

Figure 4.5.1-6. Alternative 1: South from CPSRA

View 7: Southwest from Bay Trail

View 8: Southeast from Bay Trail

Source: RHAA; Endres Ware 2010

Figure 4.5.1-7. Alternative 1: South from Bay Trail

Existing

Proposed

Source: Lennar Urban 2009

Figure 4.5.1-8. Alternative 2: Northeast from CPSRA (View 1)

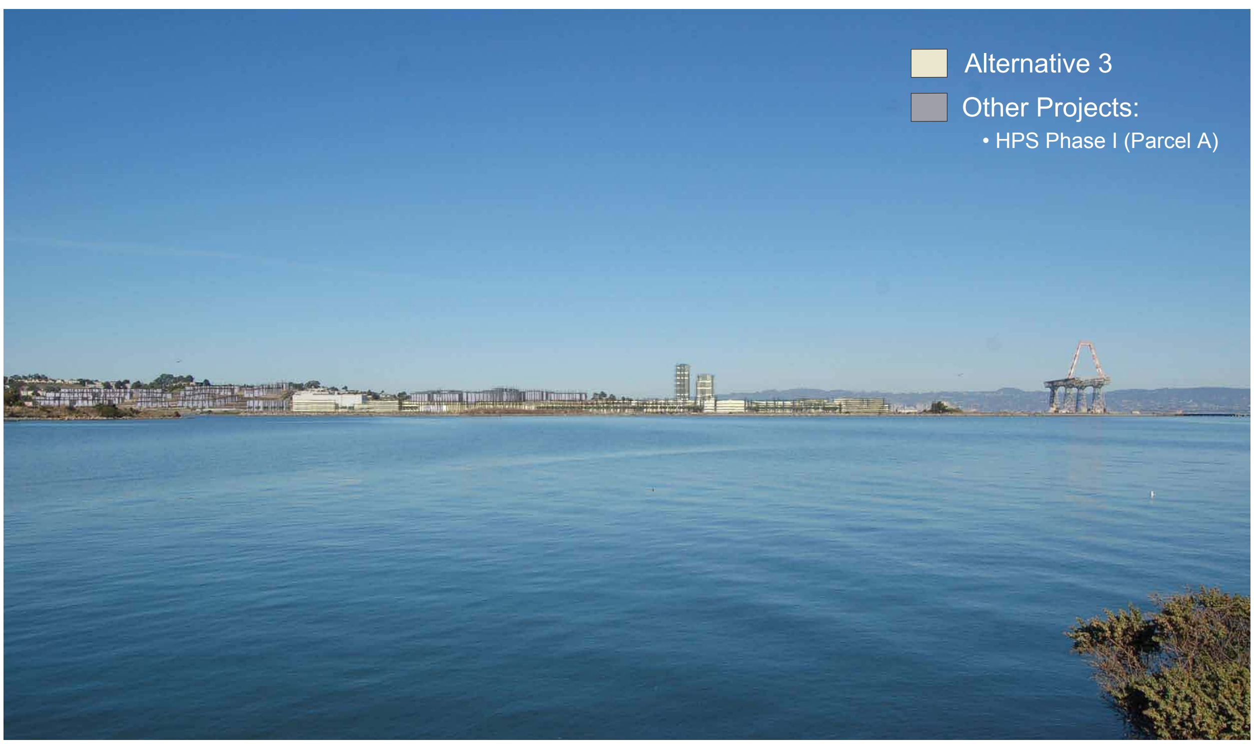
Existing

Proposed

Source: Lennar Urban 2009

Figure 4.5.1-9. Alternative 2: South from Hilltop Open Space (View 2)

Existing



Proposed

Source: Lennar Urban 2009

Figure 4.5.1-10. Alternative 3: Northeast from CPSRA (View 1)

Existing

Proposed

Source: Lennar Urban 2009

Figure 4.5.1-11. Alternative 3: South from Hilltop Open Space (View 2)

4.5.1.2.2 Light and Glare

This analysis assesses spill light and obtrusive light and glare associated with proposed lighting for the stadium, buildings (e.g., residential, commercial, and R&D), walkways, areas adjacent to buildings, and parking areas. As the lighting design has not been finalized, it is not possible to calculate the actual output that would be generated by proposed lighting. Therefore, this analysis is qualitative, and further lighting analysis could be required when the final design of the proposed action is completed.

The following terms are used in this discussion:

- ***Spill light.*** The light emitted from an installation that falls outside the boundaries of the property on which the lighting system is installed;
- ***Obtrusive light.*** Spill light that causes annoyance, discomfort, distraction, or a reduction in the ability to see essential information such as traffic signals; and
- ***Foot-candle.*** The recognized international unit for the measure of light (luminance) falling onto a surface.

Spill light can be accurately calculated and the effects of spill light can be measured for general understanding and comparison. The effects of obtrusive light are, however, the subject of debate and technical discussion. Attempts have been made to quantify obtrusive light, but this has proven to be difficult, as individuals have a range of reactions to the perceived effects of lighting on the environment. Typical night street lighting requirements are 1 to 3 foot-candles, which is considered to be unobtrusive. The following are examples of light levels:

- Bright and sunny day: 3,000 foot-candles;
- Professional sports field lighting: 300 foot-candles;
- Office: 50 to 75 foot-candles;
- Residential lighting at night: 7 to 10 foot-candles;
- Main road junction street lighting: 2.5 to 3 foot-candles; and
- Bright moonlight: 0.1 foot-candle.

Night illumination of outdoor areas can affect people in several ways. For example, where intense lighting is viewed against a dark background, the contrast attracts the attention of the viewer and could be considered annoying. Under low-light conditions, the human eye adjusts to the brightest light within the field of view. If the range of light intensity to which the eye is exposed is large, the eye will be relatively insensitive to the more dimly lighted areas within the field of view. In addition, increased illumination can affect the suitability of sleeping areas, use of outdoor areas at natural light levels, and privacy. The degree of impacts may be related to the degree of change from the illumination levels to which people have become accustomed.

4.5.2 Alternative 1: Stadium Plan Alternative

4.5.2.1 Construction Impacts

4.5.2.1.1 Factor 1: Effects on Scenic Vistas

Scenic vistas in the project vicinity include views of the bay, East Bay hills, the San Francisco downtown skyline, Hunters Point Hill, Yosemite Slough, Double Rock, and CPSRA.

Construction activities would occur throughout the project site over a period of approximately 20years (ending in 2031). During construction, four basic types of activities would be expected, and some activities could occur simultaneously.

Demolition of existing structures would occur. The site would then be prepared, excavated, and graded to accommodate the new building foundations. Over-excavation and re-compaction of near-surface soils would occur during grading to provide appropriate soil characteristics to support proposed structures. The proposed development would then be constructed, including the stadium, buildings, marina, Yosemite Slough bridge, roadway improvements, parking structures, surface parking, transit improvements, support infrastructure, parks/open space, shoreline improvements, and landscaping.

Construction activities associated with infrastructure improvements would also occur on site and in areas adjacent to the project site, such as at roadway intersections or utility infrastructure installations. Specific activities would generally include demolition of existing asphalt and concrete, grading to establish a new base for roadways, roadway improvements (e.g., medians and sidewalks), and replacement of signals and other infrastructure. In the case of water line and sewer connections, trenching would also be required to connect proposed water and sewer lines to existing utility infrastructure. Shoreline improvements would include grading, landscaping where appropriate, renovation of some existing shoreline structures, and debris removal.

Construction of the Yosemite Slough bridge would require the use of marine-based construction equipment (e.g., barge/tugboat and crane) during Phase 1. In-water construction activities within the slough would occur within public views from CPSRA, the Bay Trail, and adjacent shoreline areas. Although equipment/activities associated with construction of the Yosemite Slough bridge would be visible from public vantage points, the presence of construction equipment would be temporary and visually compatible with existing marine-industrial activity in the project vicinity.

Construction workers and equipment would be parked and staged within the project site. Visual impacts associated with construction activities would include exposed pads and staging areas for grading, excavation, and construction equipment. In addition, temporary structures would be located in the project site during various stages of demolition or construction, within materials storage areas, or associated with construction debris piles on- and offsite. Also, exposed trenches, roadway bedding (e.g., soil and gravel), spoils/debris piles, and steel plates associated with proposed utility infrastructure and roadway improvements would be visible from adjacent vantage points.

Although these activities would occur primarily within the project site, they would be visible from surrounding public vantage points. However, these visual conditions would be temporary visual distractions typically associated with construction activities encountered in developed areas. Furthermore, temporary conditions (e.g., bulldozers, trenching equipment, generators, trucks, and marine-based construction equipment) would not substantially obstruct views of the bay, Yosemite Slough, Double Rock, CPSRA, East Bay hills, or the San Francisco downtown skyline. Therefore, impacts on scenic vistas would be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1 would not impact scenic vistas, and impacts would *not be significant*.

4.5.2.1.2 Factor 2: Effects on Scenic Resources

Scenic resources in the project vicinity include the Re-Gunning Crane, Yosemite Slough, Double Rock, and CPSRA. There are no rock outcroppings or substantial landscaped areas on the project site. Construction of Alternative 1 would not affect the Re-Gunning Crane, which would remain intact after implementation of Alternative 1. Alternative 1 would retain onsite historic properties (Drydock 4, Building 208, and the Hunters Point Commercial Drydock Historic District [Drydocks 2 and 3 and Buildings 140, 204, 205, and 207]). Construction of the Yosemite Slough bridge at the east end of the slough would change the appearance of this scenic resource during construction; however, this would not be a substantial impact, as the majority of the slough would be unaffected by proposed development. Therefore, impacts on scenic resources would be *not significant,* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1 would not impact scenic resources, and impacts would be *not significant*.

4.5.2.1.3 Factor 3: Effects on Visual Character

As described above, visual impacts associated with construction activities would include exposed pads and staging areas for grading, excavation, and construction equipment. In addition, temporary structures would be located on the project site during various stages of construction, within materials storage areas, or associated with construction debris piles onsite. Exposed trenches, roadway bedding (e.g., soil and gravel), spoils/debris piles, and steel plates associated with proposed utility infrastructure and roadway improvements would be visible from adjacent vantage points.

Although construction would occur primarily onsite, these activities could affect surrounding land uses. Automobiles traveling along US-101, Harney Way, Arelious Walker Drive, Innes Avenue, and other streets in the project vicinity would have short-term views of the project site and adjacent street areas during construction activities. Potentially adverse visual impacts associated with construction activities would be temporary. Although Alternative 1 would be constructed through 2031, construction activity would occur in phases, as described Chapter 2. Implementation of environmental controls (Section 2.3.2.1.9, Environmental Controls) requiring the temporary screening of construction sites from public views at street level would minimize the visual distractions associated with construction activities commonly encountered in developed areas. Furthermore, areas of construction would vary within the project site such that areas of temporary visual distraction would change throughout the construction phases.

Additional temporary visual impacts could occur from construction equipment traveling along local roadways and inadvertently depositing dirt and debris on the streets. However, implementation of environmental controls requiring the applicant to stage all construction equipment on the project site, maintain the cleanliness of construction equipment, and sweep surrounding streets of mud and debris caused by construction vehicles, would minimize temporary impacts during construction. Adherence to environmental controls during construction would ensure that impacts on visual character/quality would *not be significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1 would not impact visual character/quality, and impacts would *not be significant*.

4.5.2.1.4 Factor 4: Effects of Light and Glare

A minimal amount of glare could result from reflection of sunlight off windows of trucks, but this would be negligible and would not affect daytime views in the project site area. Security lighting would be provided after hours on all construction sites, but lighting would be minimal, restricted to the project site, and would not exceed existing night lighting levels in the project vicinity. Therefore, impacts from light and glare would *not be significant,* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of the Tower D Variant for Alternative 1 would not impact light and glare, and impacts would *not be significant*.

4.5.2.2 Operational Impacts

4.5.2.2.1 Factor 1: Effects on Scenic Vistas

Scenic vistas in the project vicinity include views of the bay, East Bay hills, the San Francisco downtown skyline, Hunters Point Hill, Yosemite Slough, Double Rock, and CPSRA. Proposed development would not block publicly accessible views of the bay or other scenic vistas. Alternative 1 would provide a continuation of the existing street grid, thereby maintaining existing view corridors to the bay and East Bay hills. Public access areas would maintain views from the project site toward the bay and East Bay hills. While proposed development would include several high-rise towers, these towers are not clustered, and would not substantially obstruct, alter, or degrade the quality of views of the bay or beyond from any long-range viewpoints. Views of Hunters Point Hill from the East Bay would be partially obstructed from Alameda and Oakland by proposed structures. However, due to the distance of these viewpoints from the proposed facilities, proposed development would not obstruct or degrade the quality of any existing views from these locations.

Alternative 1 would provide enhanced access to the San Francisco Bay shoreline and protect views of open space and water by providing expanses of open space that preserve these views. As Alternative 1 would not substantially obstruct any scenic vistas, impacts on scenic vistas would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not obstruct any scenic vistas, and impacts would *not be significant*.

4.5.2.2.2 Factor 2: Effects on Scenic Resources

Alternative 1 would include redevelopment of HPS and removal of old, deteriorated structures associated with ship repair, piers, drydocks, and storage. Currently, HPS contains limited landscaping and is primarily a degraded industrial area. Hunters Point Hill is a prominent scenic resource west of the project site, and would remain intact with proposed development. Alternative 1 would demolish Building 253, a highly visible structure, but this structure is not identified as a scenic resource, even though some viewers might use the building for visual orientation. Alternative 1 would retain onsite historic properties (Drydock 4, Building 208, and the Hunters Point Commercial Drydock Historic District [Drydocks 2 and 3 and Buildings 140, 204, 205, and 207]) at HPS, as well as the Re-Gunning Crane, a highly visible feature. Development of the project site would also include 231.6 ac (94 ha) of new and renovated parkland and open space facilities with improved public access, thereby improving the scenic quality of the area. Proposed shoreline improvements and construction of the new marina would enhance the visual quality of the shoreline along HPS, by reducing erosion and removing debris. These improvements would represent a beneficial impact of the proposed development, and improve the overall visual character of the shoreline. Alternative 1 would complete the Bay Trail along the waterfront and provide substantial areas of parks and open space that would complement the slough restoration proposed as part of the Yosemite Slough Restoration Project. While the Yosemite Slough bridge would alter the visual character of the slough by placing a structure across the neck of the slough, this change would not be substantial. The bridge would be designed with a low height (9 ft [3 m] above water at the approach of the span and extending to 16 ft [5 m] above water at its tallest point) and would blend into the environment to the extent feasible through the use of openwork, materials, and color. The proposed bridge and roadway approaches through an otherwise entirely open space/recreational area would have some adverse impacts when compared to the undeveloped, natural character of the slough. However, the slough is, and would continue to be, located within an urban environment, surrounded in part by developed parcels and roads. Therefore, even without the proposed bridge and roadway approaches, CPSRA users are aware of and in close proximity to existing development adjacent to the park. Although the proposed bridge and roadway approaches would traverse an open space area in one location, the majority of the restored slough area would remain unaffected and available for its intended use. In addition, the proposed bridge and roadway approaches would provide some benefits to the areas restored as part of the Yosemite Slough Restoration Project, including access and new public vantage points. Therefore, development at the project site would not adversely impact a scenic resource or other feature that contributes to a scenic public setting. Impacts on scenic resources would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1 would not adversely impact a scenic resource or other feature that contributes to a scenic public setting, and impacts would *not be significant*.

4.5.2.2.3 Factor 3: Effects on Visual Character

Alternative 1 would consist of four development districts (HPS North, HPS Village Center, R&D, and HPS South) within HPS, and would include a variety of land uses, including residential, neighborhood retail, research and development (R&D), artists' studios/art center, community services, stadium, marina, parking, parks, and open space. This alternative would demolish all existing industrial structures at HPS, with the exception of historic properties (Drydock 4, Building 208, and the Hunters Point Commercial Drydock Historic District [Drydocks 2 and 3 and Buildings 140, 204, 205, and 207]) and the Re-Gunning Crane. Under this alternative, the proposed street network would extend the existing grid of the adjacent neighborhoods into the project site. Alternative 1 would include 231.6 ac (94 ha) of parks and open space facilities. New parks would include neighborhood parks, destination parks, a sports field complex and multi-use lawn, waterfront promenade, and waterfront recreation areas.

Proposed design elements would enhance the identity of the HPS development districts. This would be accomplished through visual elements, such as compatible architectural styles, that would provide a transition from existing development. Other elements would be included to create a distinct sense of place, such as landscaping, transit shelters, street trees, sidewalk plantings, and pedestrian amenities (e.g., outdoor picnic areas, plazas, and seating areas). Street-side plantings and distinctive pavement treatments would be extensive throughout the project site and designed to enhance building architecture and emphasize public and commercial areas. Proposed parks and open space areas would be extensively landscaped.

The proposed development would be compatible with the type, scale, form, and location of surrounding land uses in the BVHP neighborhood. Alternative 1 would include Redevelopment Plan documents that would specify development standards for setbacks, heights, massing, hillside development, and other building features at HPS. These standards would prevent juxtaposition of incompatible uses, ensure a gradual transition of density and bulk, and provide connectivity between existing and proposed land uses within the HPS development districts, as discussed below.

The HPS North district would include residential and neighborhood retail uses on approximately 27 net ac (11 ha) located south of the mixed-use India Basin neighborhood. Proposed development would range from densities of 15 to 285 units per ac, with maximum heights ranging from 40 ft (12 m) to 85 ft (26 m). These uses would be adjacent to, and similar in scale and character, to adjacent residential uses at the HPS Phase I (Parcel A) site, which would have heights ranging from 35 ft (11 m) to 65 ft (20 m). One residential tower with a maximum height of 370 ft (113 m) would be located at the southeast corner of the district, adjacent to the HPS Village Center. Although this tower would be taller than adjacent development, it would include neighborhood retail uses, which would be compatible with surrounding development (i.e., neighborhood retail and residential).

The HPS Village Center district would include residential and neighborhood retail development on approximately 7.6 net ac (3.1 ha). New buildings would have maximum height limits of 65 ft (20 m). Proposed uses would be similar in type and scale to surrounding mixed-use and residential development within the HPS Phase I (Parcel A) development. Building heights and massing would be similar, and proposed uses would gradually transition from residential to mixed- use (residential and commercial)/R&D uses within the HPS development districts.

Proposed uses in the R&D district would include R&D uses (e.g., office and light industrial), residential units, and neighborhood retail uses. Proposed residential units on the western portion of the district would be adjacent to residential development in the HPS North district, and neighborhood retail uses would be located east of commercial development within the HPS Village Center district. With the exception of one high-rise tower (270 ft [82 m]) in the northwestern portion of the district, maximum heights of residential and retail structures would be 65 ft (20 m). Proposed R&D structures located in the center of the district would range from 85 ft (26 m) to 105 ft (32 m) in height.

The HPS South district would include R&D uses (e.g., office and light industrial uses), community service uses along Crisp Road, a new 69,000-seat football stadium, dual-use sports complex and multi-use lawn, and parking areas. Maximum heights of the R&D structures would be 85 ft (26 m). The stadium would be five levels on the north, east, and south sides and nine levels on the west (referred to as the Suite Tower). The top row of seating would be at an elevation of approximately 156 ft (47.5 m) above the playing field; the top of the stadium light towers would be approximately 192 ft (58.5 m) above the field. The change from an industrial setting to that of a stadium would not be adverse. The HPS South district would be surrounded by new open space areas to the east and south, and R&D uses to the north. Proposed development would replace waterfront industrial facilities and vacant lots.

The visual impacts that would result from Alternative 1 would depend on the specific location and elevation of the observer, as discussed below.

View 1: Northeast from CPSRA (Figure 4.5.1-2)

Looking northeast to HPS from the eastern portion of CPSRA, views of the bay and existing HPS buildings are prominent in the foreground (Figure 4.5.1-2). Proposed development would include a stadium, new marina, and R&D buildings. A residential tower, up to 370 ft (113 m) in height, would be visible beyond the stadium from this vantage point. The Re-Gunning Crane would remain as a highly visible landmark, although Building 253, also a prominent structural feature, would be demolished. However, Building 253 is not considered a scenic resource and, therefore, its removal would not substantially degrade the existing visual character of the project site. The approved HPS Phase I (Parcel A) development, which is not part of this alternative and is currently under construction, would be visible in the middle-ground. Existing views of degraded, vacant, and unmaintained areas would be replaced with well-designed development. Therefore, Alternative 1 would not substantially degrade the existing visual character or quality of the project site or its surroundings from this vantage point. Impacts on visual resources would *not be significant*.

View 2: South from Hilltop Open Space (Figure 4.5.1-3)

Figure 4.5.1-3 depicts views from hilltop open space to be completed as part of HPS Phase I (Parcel A) (not a part of this alternative). Existing structures are visible in the middle-ground, with the Re-Gunning Crane prominent to the south. The bay and Santa Cruz Mountains on the San Francisco Peninsula are visible in the background.

Under this alternative, this view would include the stadium, and surrounding parking areas and dual-use playfields. During football events, the parking area and dual-use fields seen from this view would be filled with vehicles. The new stadium would be taller than the existing structures. The stadium would partially obstruct background views of the Santa Cruz Mountains. The waterfront area near the Re-Gunning Crane would become a recreation area. The view of the Re-Gunning Crane would remain as a landmark and the new marina would be visible. Middle-ground views of degraded and unmaintained areas would be replaced with well-designed development. Therefore, Alternative 1 would not substantially degrade the existing visual character or quality of the project site or its surroundings. Impacts on visual resources from this vantage point would *not be significant*.

View 3: East from Hunters Point Hill Open Space (Figure 4.5.1-4)

Figure 4.5.1-4 depicts views from open space on Hunters Point Hill towards the project site looking southeast. Existing structures and areas cleared as part of the HPS Phase I (Parcel A) development are visible from this vantage point. Alternative 1 would replace the existing structures in the middle-ground with mid-rise and two residential towers, up to 370 ft (113 m) in height. New open space areas at HPS would be visible at the base of the hill. The approved HPS Phase I (Parcel A) development, which is not part of this alternative, would be visible from this vantage point. Middle-ground views of degraded and unmaintained areas would be replaced with well-designed development. Therefore, Alternative 1 would not substantially degrade the existing visual character or quality of the site or its surroundings from this vantage point. Impacts on visual resources would *not be significant.*

View 4: Southeast from Heron's Head Park (Figure 4.5.1-5)

Figure 4.5.1-5 depicts a view from Heron's Head Park, north of India Basin, towards HPS. This view includes wetlands at Heron's Head Park, HPS structures in the middle ground, and background views of San Francisco Bay and the East Bay hills. Alternative 1 would replace existing development on HPS with new low-, mid-, and high-rise development up to 370 ft (113 m) in height. The approved HPS Phase I (Parcel A) development, not part of this alternative, would be visible above India Basin. Building 253, a structural landmark, would be demolished; however, the Re-Gunning Crane would remain as a landmark. Building 253 is not considered a scenic resource and, therefore, its removal would not substantially degrade the existing visual character of the project site. Middle-ground views of degraded, vacant, and unmaintained areas would be replaced with well-designed development. Therefore, Alternative 1 would not substantially degrade the existing visual character or quality of the site or its surroundings. Impacts on visual resources from this vantage point would *not be significant.*

Views 5 and 6: South from CPSRA (Figure 4.5.1-6)

Figure 4.5.1-6 depicts two views from the CPSRA towards Yosemite Slough looking south; south from Picnic Knoll (View 5) and southeast from Northside Plaza (View 6). Views of undeveloped, open space areas are visible in the foreground, with distant vistas of San Francisco Bay and the East Bay Hills. Middle-ground vistas of Double Rock are visible from the Picnic Knoll (View 5). Alternative 1 would construct a bridge with a low profile and green design elements (openwork, materials, and color) that would be integrated into the open space on either side of the slough to blend into the environment to the extent feasible. The final design of the bridge would be developed in coordination with BCDC and CDPR.

The bridge would alter the appearance of a portion of the slough and would replace views of open water from some adjacent public vantage points. The 81-ft (25-m) wide, seven lane bridge would cross the slough at its narrowest point, extending Arelious Walker Drive and connecting HPS and Candlestick Point. The bridge and its approach streets would have two dedicated BRT lanes, a Class I bicycle path, a sidewalk, and a greenway that would be converted to four vehicle travel lanes on game days. Traffic on the bridge would obstruct views of the bay from these vantage points. However, obstruction of views associated with Bus Rapid Transit (BRT) vehicles would occur intermittently for brief periods of time; automobile traffic would be restricted to NFL game days. Pedestrians/bicyclists would not represent substantial, permanent obstructions to views of San Francisco Bay from these vantage points (Figure 4.5.1-6). Although the bridge would partially obstruct views of the bay from close range vantage points, placement of a low profile bridge at one end of the slough would not substantially degrade the visual character or quality of the site, as the vast majority of the slough would be unaffected by proposed development. Yosemite Slough would continue as a waterway bordered by open space on the narrow channel to the west to the wider South Basin to the east (Figure 4.5.1-6). In addition, Alternative 1 would improve access to CPSRA allowing a greater number of people to observe the scenic resources along the CPSRA shoreline and Yosemite Slough. Yosemite Slough and the CPSRA shoreline would continue to be prominent scenic resources that would be visible from several public vantage points.

Proposed development would not alter the existing Double Rock formation. Double Rock would continue to be visible from the CPSRA shoreline, including proposed shoreline open-space areas to be restored as part of the Yosemite Slough Restoration Project (Figure 4.5.1-6; View 5). The Yosemite Slough bridge would include pedestrian/bicycle lanes that would provide views of Double Rock. The proposed bridge would obstruct some public vantage points of Double Rock from CPSRA (west of the bridge). However, Double Rock would be visible below the bridge from surrounding vantage points within the Yosemite Slough area (Figure 4.5.1-6; View 5). Overall, Alternative 1 would maintain or enhance views of Double Rock from surrounding public viewpoints. Since Yosemite Slough would continue to be a prominent scenic resource surrounded by open space and visible from many locations, impacts on visual resources from this vantage point would *not be significant.*

Views 7 and 8: South from Bay Trail (Figure 4.5.1-7)

Figure 4.5.1-7 depicts two views from the Bay Trail towards Yosemite Slough looking south; southwest from Bay Trail (View 7); and southeast from Bay Trail (View 8). Looking southwest to Yosemite Slough from the Bay Trail, views of the Yosemite Slough shoreline are prominent in the foreground (Figure 4.5.1-7; View 7). Yosemite Slough is visible in the middle-ground, with background views of San Francisco Bay and the East Bay hills. The proposed bridge would be designed with a low profile that would not substantially protrude above grade. From a distance, the Yosemite Slough bridge would not appear as a prominent feature. The bridge would be integrated into open space on either side of the slough, and would contain pedestrian/bicycle paths that would provide greater public viewing opportunities of surrounding scenic resources. Yosemite Slough would remain as a waterway bordered by open space from a narrow channel to the west to the wider South Basin to the east and would remain a scenic resource (Figure 4.5.1-7; View 7). The Yosemite Slough bridge would not be prominent in any panoramic views of the project site and would not obstruct, alter, or degrade the visual character or quality of scenic views (San Francisco Bay and Yosemite Slough) from this vantage point. Therefore, impacts on visual resources would *not be significant.*

The CPSRA shoreline, Yosemite Slough, and San Francisco Bay are visible looking southeast to Yosemite Slough from the Bay Trail (Figure 4.5.1-7; View 8). Alternative 1 would construct a low profile bridge at one end of the slough that would partially obstruct views of Yosemite Slough and San Francisco Bay from this vantage point (Figure 4.5.1-7; View 8). However, since Yosemite Slough would continue to be a prominent scenic resource surrounded by open space and visible from many locations, the bridge would not cause substantial damage to this scenic resource. In addition, views of Yosemite Slough and the bay would be visible from the bridge and proposed improved shoreline areas, which would provide viewing opportunities not currently available. The bridge would not substantially obstruct views of Yosemite Slough or San Francisco Bay or damage a scenic resource because the bridge would have a small footprint relative to the expanse of the slough, and because its design would be visually integrated into the environment to the extent feasible. The final design of the bridge would be developed in coordination with BCDC and CDPR. As Alternative 1 would not substantially degrade the existing visual character or quality of this vantage point, impacts on visual resources would *not be significant*.

Alternative 1 would revitalize and redevelop deteriorated, vacant, and underutilized parcels into a connected complex of districts that would provide access to surrounding neighborhoods. Heights and massing of proposed structures adjacent to existing neighborhoods would be limited to provide a visual transition from the existing neighborhoods; the taller and more massive structures would be concentrated within the interior of the project site. Alternative 1 would provide extensive areas of open space that would be integrated with existing open space areas to enhance the visual quality of areas along the shoreline (e.g., BVHP), and would not substantially obstruct views of the bay, East Bay hills, and/or San Bruno Mountains from adjacent vantage points. Overall, this alternative would improve the visual appearance of the project site by removing deteriorated structures and enhancing neighborhood shoreline access. The existing street grid would be extended and expanded, preserving the overall urban pattern of BVHP.

Alternative 1 would alter the scenic nature of the project site as it would create a dense urbanized setting compared to existing conditions. On the north side, the bridge would cross the eastern edge of the CPSRA area as well as a small portion of the CPSRA on the south side. The bridge would be designed as a low structure to integrate into the existing environment to the maximum extent feasible through openwork, materials, and color. While the bridge would be constructed in an undeveloped, open space area, it would connect two urbanized areas immediately adjacent to the slough. Considering not just the slough, but the context of the project site, the bridge would not be an element that is out of character/scale with surrounding development. Therefore, this change in character would not represent a substantial degradation of scenic quality.

In summary, Alternative 1 would replace deteriorating structures, vacant parcels, expanses of asphalt/dirt, and piles of debris with a high-quality environment that would include a variety of architectural styles and open space. Therefore, Alternative 1 would not substantially degrade the visual quality or character of project site and/or project vicinity. Because impacts on visual character would *not be significant*, no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D for Alternative 1 would not degrade the visual quality or character of project site, and impacts would *not be significant*.

4.5.2.2.4 Factor 4: Effects on Light and Glare

Proposed development would introduce new sources of light and glare to an area that currently has minimal nighttime lighting. Project lighting would be used to highlight architectural elements, landscaping, and signage. The types of signs that could contribute to an increase in lighting would generally be restricted to entrance signage and marquee building signs in commercial areas. In addition, new buildings would be illuminated externally for security purposes, and other lighting fixtures would be placed in parking areas, public common areas, and walkways to ensure visitor and employee safety. Very limited and low-level lighting would be provided in open space areas. In these areas, lighting would be limited to decorative lighting along walkways. Landscape and exterior sign lighting would be of a low intensity, low glare design (Section 2.3.2.1.9, Environmental Controls).

Sources of daytime glare currently exist in the project site area from building surfaces and windows. Some additional glare could be produced by the increased amount of surface area of the proposed structures, which could reflect or concentrate sunlight and result in a potentially significant impact. Exterior building surfaces and windows can be a source of glare, particularly if highly reflective surfaces are utilized. However, proposed structures would be designed using textured or other nonreflective exterior surfaces and nonreflective glass (Section 2.3.2.1.9, Environmental Controls). In addition, landscaping adjacent to the structures would diffuse glare from new structure surfaces and windows. As Alternative 1 would use non-reflective textured surfaces on building exteriors and nonreflective glass, impacts related to daytime glare would *not be significant*.

Parking area lighting would be located within the proposed R&D development. The nearest residential areas would be located in the HPS Phase I (Parcel A) development, approximately 500 ft north of the parking area. Those residences would be approximately 50 to 200 ft above the grade of the parking facilities for the stadium and, although the lighted parking areas would be visible from HPS Phase I (Parcel A) development, the residents would not be exposed to direct lighting from the parking areas. In addition, parking lots and other security lighting would be shielded to direct light downward onto the specific location intended for illumination and prevent spill-over onto adjacent areas. All parking structures would be constructed with screening walls of sufficient height to block spill light from vehicle headlights (Section 2.3.2.1.9, Environmental Controls). Therefore, impacts would *not be significant*.

The final lighting design has not been completed. As part of the design process, a lighting plan would be prepared, and would include the types and locations of all lighting fixtures (Section 2.3.2.1.9, Environmental Controls). All lighting sources would be subject to fixture height requirements, oriented toward the ground, and screened to minimize offsite illumination and prevent glare. The final design of proposed lighting fixtures would be determined during the final design phase.

NFL teams typically play half of pre-season and regular season games at home. The NFL schedule includes four pre-season games and 16 regular season games generally beginning in August and running through December. In one season, a team could play up to two pre-season, eight regular season, and two post-season games at home. The majority of NFL games would occur during the day, but some night games could occur. In addition to NFL football, other major events could occur at the stadium, including college football games, soccer games, concerts, festivals, antique and car shows, or other events. These additional events would be limited to 20 total occurrences per year.

Lighting for the stadium would be consistent with NFL Sports Lighting Design Criteria. Lighting would consist of event field lighting, exterior stadium lighting (i.e., building perimeter lighting and parking lot lighting), and emergency lighting. The exact type and quantity of light bulbs and fixtures would be determined by the manufacturer’s ability to achieve the performance criteria required for players, spectators, and television broadcasts, which would apply to the entire playing field including an additional 15 ft beyond the end zones and sidelines. Lighting levels in the stands would gradually taper off from the maximum light intensity levels on the playing field. Field lighting would only be required for large events during evening hours, such as late afternoon or evening sporting events or concerts. Modern field lights are designed for specific directional light and reduction of spill light. Data have shown that less than three foot-candles can be achieved one block away from the stadium and less than one foot-candle of illumination two blocks away from the stadium (Personal communication, ME Engineers 2004). Three and one foot-candles are comparable to normal street lighting in residential areas. While the overall ambient light levels on the site would noticeably increase when the stadium lights are in use, the lighting would not spill over or directly impact residences in surrounding neighborhoods. Users of the Yosemite Slough/CPSRA would not be affected by nighttime lighting, as the CPSRA is closed after dark.

The top row of stadium seating would be approximately 156 ft (48 m) above the playing field; the top of the stadium light towers would have an elevation of approximately 192 ft (59 m). As noted, the lighting system for the stadium has not been designed at this time. The stadium lighting would meet criteria for lighting for players, spectators, and television broadcasts, and would likely provide 250 foot-candles to 300 foot-candles at the field level. The 192 ft (58.5 m) tall lighting towers would allow the light to be angled downward and would use fixtures that focus light on the field and reduce glare. In addition, because the stadium height would reach 156 ft (47.5 m) above the playing field, the illuminated portion of the playing field would not be visible from adjacent areas. However, scoreboards and lighted signage would be a source of night illumination. Prior to opening the stadium, the stadium operator would test the installed field-lighting system to ensure that lighting meets operating requirements in the stadium and minimizes obtrusive spill lighting in the stadium. The stadium operator would also ensure that stadium lighting is oriented in such a manner to reduce the amount of light shed onto sensitive receptors and incorporate "cut-off" shields as appropriate to minimize any increase in lighting at adjacent properties (Section 2.3.2.1.9, Environmental Controls).

Information on lighting effects for the San Francisco Giants Ballpark provides a comparison of potential offsite light and glare effects associated with Alternative 1. The San Francisco Giants Ballpark EIR (*San Francisco Giants Ballpark at China Basin Final Environmental Impact Report* 1997) analyzed the effects of stadium lighting on offsite receptors at varying distances from the stadium. For example, computer modeling of light generated by stadium lighting resulted in light levels of 1.0 foot-candle at 300 ft (91 m), 0.2 foot-candle at 800 ft (244 m), and 0.0 foot-candle at 1,500 ft (457 m) (*San Francisco Giants Ballpark at China Basin Final EIR* 1997). As noted above, the nearest residential areas to the proposed stadium would be within the HPS Phase I (Parcel A) development, approximately 650 ft (198 m) north of the stadium. Based on the light levels for the Giants Ballpark, light levels at this location would be between 0.2 and 1.0 foot-candle. Such a change in the light level at this location would be less than that associated with typical street lighting, which would not be substantial. Light levels generated from the stadium at other locations, such as Mariner Village, approximately 1,250 ft (381 m) away, and proposed HPS Phase I (Parcel A) development along Crisp Road, and residential development within HPS, each approximately 1,500 ft (457 m) or more away, would not be substantial. As noted above, users of the Yosemite Slough/CPSRA would not be affected by stadium lighting, as the CPSRA is closed after dark. Nonetheless, the light fixtures themselves would be directly visible from some locations, and could diminish night views from these areas, which some residents could find obtrusive. Night events would occur a maximum of 25 days per year (including night football games and other events). However, the stadium operator would be required to test the installed field-lighting system to ensure lighting meets the stadium operating requirements and minimizes obtrusive spill lighting from the facility. Implementation of these environmental controls would ensure impacts from light and glare would *not be significant.*

Additionally, night views of the project site from Alameda and Oakland (i.e., across the bay) would change from a relatively low lighting levels to a higher level of illumination. However, due to the distance of these viewpoints from the proposed facilities, increased lighting associated with proposed development would not interfere with any existing nighttime views from these locations.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1 would not impact light and glare, and impacts would *not be significant*.

4.5.3 Alternative 1A: Stadium Plan/No-Bridge Alternative

4.5.3.1 Construction Impacts

4.5.3.1.1 Factor 1: Effects on Scenic Vistas

Alternative 1A would be the same as Alternative 1 except that the Yosemite Slough bridge would not be constructed. Elimination of the Yosemite Slough bridge would minimize visual impacts associated with the presence of marine-based construction equipment in the slough. Although Alternative 1A would include the same construction period as Alternative 1, impacts to scenic vistas during construction would be similar but less than those described for Alternative 1 due to elimination of the Yosemite Slough bridge (refer to Section 4.5.2.1.1, Factor 1: Effects on Scenic Vistas). Similar to Alternative 1, construction activities would not result in adverse effects on any scenic vistas. Therefore, impacts on scenic vistas would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A would not impact scenic vistas, and impacts would *not be significant*.

4.5.3.1.2 Factor 2: Effects on Scenic Resources

Impacts on scenic resources from construction of Alternative 1A would be similar but less than those for Alternative 1, due to elimination of the Yosemite Slough bridge. Impacts on scenic resources, including Yosemite Slough, Double Rock, and CPSRA shoreline, would be substantially reduced as the appearance of the slough would not be altered by construction of a bridge. Similar to Alternative 1, the Re-Gunning Crane and historic properties would be retained on site. Impacts on scenic resources would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of the Tower D Variant for Alternative 1A would not impact scenic resources, and impacts would *not be significant*.

4.5.3.1.3 Factor 3: Effects on Visual Character

Similar to Alternative 1, construction activities for Alternative 1A would result in exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and steel plates that would be visible during construction of utility infrastructure and roadway improvements. However, implementation of environmental controls would reduce impacts during construction by requiring the applicant to screen construction sites from public views at street level and provide appropriate staging of construction equipment; keep the surrounding streets clean and free from construction debris; and maintain the cleanliness of construction equipment (Section 2.3.2.1.9, Environmental Controls). Therefore, impacts on visual character would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A would not impact visual character/quality, and impacts would *not be significant*.

4.5.3.1.4 Factor 4: Effects on Light and Glare

Construction of Alternative 1A would occur during daylight hours, and therefore, glare could be created as a result of reflection of sunlight off windows of trucks and other construction materials that have the potential to generate glare (i.e., glass). However, similar to Alternative 1, the glare created by construction activities at the project site would not be substantial enough to affect daytime views in the area. Security lighting would be provided after-hours on all construction sites, but this lighting would be minimal, restricted to the project site, and would not exceed the level of existing night lighting in surrounding urban areas. Therefore, impacts from light and glare would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A would not impact light and glare, and impacts would *not be significant*.

4.5.3.2 Operational Impacts

4.5.3.2.1 Factor 1: Effects on Scenic Vistas

Development under Alternative 1A would have a reduced bulk and mass compared to Alternative 1, due to elimination of the Yosemite Slough bridge. Alternative 1A would change views of the project site from surrounding public viewpoints, but would not substantially obstruct any scenic vistas. Under this alternative, impacts on scenic vistas would be similar but less than those described for Alternative 1, because the extent of new structures and infrastructure would be reduced with elimination of the Yosemite Slough bridge. Similar to Alternative 1, this alternative would provide enhanced access to the San Francisco Bay shoreline and protect views of open space and water by providing expanses of open space that preserve these views. As Alternative 1A would not substantially obstruct any scenic vistas, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A would not obstruct any scenic vistas, and impacts would *not be significant*.

4.5.3.2.2 Factor 2: Effects on Scenic Resources

Development under Alternative 1A would have a reduced bulk and mass compared to Alternative 1 due to elimination of the Yosemite Slough bridge. Under Alternative 1A, scenic resources at HPS would be retained, including the Re-Gunning Crane and historic properties (Drydock 4, Building 208, and the Hunters Point Commercial Drydock Historic District [Drydocks 2 and 3 and Buildings 140, 204, 205, and 207]). Under this alternative, 231.6 ac (94 ha) of new and renovated parkland, open space, and sports fields, with improved public access would be constructed, thereby improving the scenic quality of the area. Similar to Alternative 1, implementation of Alternative 1A would not damage or remove any scenic resources that contribute to a scenic public setting. Impacts on scenic resources would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A would not adversely impact a scenic resource or other feature that contributes to a scenic public setting, and impacts would *not be significant*.

4.5.3.2.3 Factor 3: Effects on Visual Character

Under this alternative, impacts on visual character would be reduced compared to Alternative 1 because the extent of new structures and infrastructure massing would be minimized with elimination of the Yosemite Slough bridge. Similar to Alternative 1, Alternative 1A would not substantially degrade the visual character or quality of the project site or project vicinity. In fact, development under Alternative 1A would improve the degraded and deteriorated condition of the project site. The proposed shoreline improvements would improve the visual quality of the shoreline by reducing erosion and removing debris. As with Alternative 1, impacts on visual character would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A would not degrade the visual quality or character of project site, and impacts would *not be significant*.

4.5.3.2.4 Factor 4: Effects on Light and Glare

Development under Alternative 1A would increase lighting on the project site relative to existing conditions, and new building surfaces would increase the level of illumination in the project site area.

Similar to Alternative 1, lighting fixtures would be of a low intensity, low glare design, and would be shielded to direct light downward and prevent spill-over onto adjacent areas. New construction would include the use of textured or other nonreflective exterior surfaces and nonreflective glass. A lighting plan would be prepared for each sub-phase of the project that includes the location of exterior lighting, types of lighting, and lighting specifications (e.g., beam spreads and/or photometric calculations) (Section 2.3.2.1.9, Environmental Controls). Implementation of these environmental controls would ensure impacts from light and glare would *not be significant*.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A would not impact light and glare, and impacts would *not be significant*.

4.5.4 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

4.5.4.1 Construction Impacts

4.5.4.1.1 Factor 1: Effects on Scenic Vistas

Under Alternative 2, construction activities would occur during a similar build-out period as Alternative 1. Visual impacts associated with construction activities would include exposed pads and staging areas for grading, excavation, and construction equipment. In addition, temporary structures would be located on the site during various construction stages within materials storage areas, or associated with construction debris piles on and off site. Exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and steel plates associated with proposed utility infrastructure and roadway improvements would be visible from adjacent vantage points. Construction of the Yosemite Slough bridge would require the use of marine-based construction equipment (e.g., barge/tugboat and crane), which would be visible from public vantage points. However, these visual conditions would be temporary visual distractions typically associated with construction activities encountered in developed areas. Furthermore, temporary conditions (e.g., bulldozers, trenching equipment, generators, trucks, and marine-based construction equipment) would not substantially obstruct views of the bay, Yosemite Slough, Double Rock, CPSRA, East Bay hills, or the San Francisco downtown skyline. Therefore, impacts on scenic vistas would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or Building Preservation option for Alternative 2 would not impact scenic vistas, and impacts would *not be significant*.

4.5.4.1.2 Factor 2: Effects on Scenic Resources

Scenic resources in the project vicinity include the Re-Gunning Crane, Yosemite Slough, Double Rock, and CPSRA. There are no rock outcroppings or substantial landscaped areas on the project site. Similar to Alternative 1, proposed construction activities would not affect the Re-Gunning Crane, which would remain intact after implementation of Alternative 2. In addition, this alternative would retain onsite historic properties (Drydocks 2, 3, and 4 and the Hunters Point Commercial Drydock Historic District). In addition, four structures (Buildings 211, 224, 231, and 253) could be preserved under this alternative. Construction of the Yosemite Slough bridge at one end of the slough would change the appearance of this scenic resource during construction; however, this would not be a substantial impact as the majority of the slough would be unaffected by proposed development. Therefore, impacts on scenic resources would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or Building Preservation option for Alternative 2 would not impact scenic resources, and impacts would *not be significant*.

4.5.4.1.3 Factor 3: Effects on Visual Character

Similar to Alternative 1, construction activities for Alternative 2 would result in exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and steel plates that would be visible during construction of utility infrastructure and roadway improvements. Although construction activities would occur primarily on site, these activities could be visible from surrounding public vantage points. As with Alternative 1, implementation of environmental controls would reduce impacts during construction by requiring the applicant to screen construction sites from public views at street level and provide appropriate staging of construction equipment; keep the surrounding streets clean and free from construction debris; and maintain the cleanliness of construction equipment (Section 2.3.2.1.9, Environmental Controls). Impacts on visual character would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or Building Preservation option for Alternative 2 would not impact visual character/quality, and impacts would *not be significant*.

4.5.4.1.4 Factor 4: Effects on Light and Glare

Construction of Alternative 2 would occur during daylight hours, and therefore, glare could be created as a result of reflection of sunlight off windows of trucks and other construction materials that have the potential to generate glare (i.e., glass). However, similar to Alternative 1, the glare created by construction activities at the project site would not be substantial enough to affect daytime views in the area. Security lighting would be provided after-hours on all construction sites, but this lighting would be minimal, restricted to the project site, and would not exceed the level of existing night lighting in surrounding urban areas. Impacts from light and glare would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or Building Preservation option for Alternative 2 would not impact light and glare, and impacts would *not be significant*.

4.5.4.2 Operational Impacts

4.5.4.2.1 Factor 1: Effects on Scenic Vistas

Development under Alternative 2 would have a reduced bulk and mass compared to Alternative 1. Under this alternative, the stadium proposed under Alternative 1 would be replaced with 2,500,000 ft^2 of additional R&D areas emphasizing new technologies at HPS. Buildings constructed as part of Alternative 2 would range in height from 40 ft (12m) to 370 ft (113 m). Maximum building heights for R&D structures west of the buildings (Buildings 211, 224, 231, and 253) that could be preserved under Alternative 3 would increase from 85 ft (26 m) to 120 ft (37 m) to accommodate the displaced R&D uses. Open space would surround the additional R&D areas to the east, south, and west. Alternative 2 would change views of the project site from surrounding public viewpoints, but would not substantially obstruct any scenic vistas. Under this alternative, impacts on scenic vistas would be similar in nature to, but slightly less than those described for Alternative 1 because the extent of new structures and infrastructure would be reduced with the elimination of the stadium.

Similar to Alternative 1, proposed development would not substantially block publicly accessible views of the bay or other scenic vistas. Views of the East Bay and the bay from the project site would be maintained within public access areas, including CPSRA (Figure 4.5.1-8) and HPS Phase I (Parcel A) Hilltop Open Space (Figure 4.5.1-9). Therefore, development under this alternative would not substantially obstruct any scenic vistas. Impacts on scenic vistas would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D or Building Preservation option for Alternative 2 would not obstruct any scenic vistas, and impacts would *not be significant*.

4.5.4.2.2 Factor 2: Effects on Scenic Resources

Development under Alternative 2 would have a reduced bulk and mass compared to Alternative 1, as described above, due to elimination of the stadium and construction of additional R&D areas at HPS. Development under Alternative 2 would not substantially damage scenic resources that contribute to a scenic public setting. Scenic resources at HPS would be retained, including the Re-Gunning Crane and historic properties (Drydocks 2, 3, and 4 and the Hunters Point Commercial Drydock Historic District). In addition, four structures (Buildings 211, 224, 231, and 253) could be preserved under this alternative. A total of 222.2 ac (90 ha) of new and renovated parkland and open space, with improved public access would be constructed, thereby improving the scenic quality of the area.

Alternative 2 would complete the Bay Trail along the waterfront and provide substantial areas of parks and open space that would complement the slough restoration proposed as part of the Yosemite Slough Restoration Project. The Yosemite Slough bridge would alter the visual character of a portion of the slough and would partially obstruct views of Yosemite Slough and the bay from some public vantage points. Under Alternative 2, the bridge width would be reduced to 39 ft (12 m) because the additional four vehicle lanes required to accommodate game day traffic under Alternative 1 would not be constructed. Similar to Alternative 1, the bridge would be designed with a low profile that would not substantially protrude above grade. Views of Yosemite Slough and the bay would be visible from the bridge and proposed improved shoreline areas, which would provide viewing opportunities not currently available. The bridge would not substantially obstruct views of Yosemite Slough or San Francisco Bay or damage a scenic resource because the bridge would have a small footprint relative to the expanse of the slough, and because its design would be visually integrated into the environment to the extent feasible. Similar to Alternative 1, implementation of Alternative 2 would not damage or remove any scenic resources that contribute to a scenic public setting. Impacts on scenic resources would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 2 would not adversely impact a scenic resource or other feature that contributes to a scenic public setting, and impacts would *not be significant*.

4.5.4.2.3 Factor 3: Effects on Visual Character

Under this alternative, impacts on visual character would be similar to but less than those described for Alternative 1 because the extent of new structures and infrastructure massing would be reduced with the elimination of the stadium and construction of additional R&D areas at HPS. Similar to Alternative 1, Alternative 2 would not substantially degrade the visual character or quality of the project site or project vicinity. In fact, development under Alternative 2 would improve the degraded condition of the project site by removing old, deteriorated structures and replacing them with new development. The proposed shoreline improvements would improve the visual quality of the shoreline by reducing erosion and removing debris.

The visual impacts that would result from Alternative 2 would depend on the specific location and elevation of the observer, as discussed below.

View 1: Northeast from CPSRA (Figure 4.5.1-8)

Figure 4.5.1-8 depicts views from the eastern portion of CPSRA towards the project site looking northeast. Views of the bay and existing HPS buildings are prominent from this vantage point. Proposed development would include the Yosemite Slough bridge, R&D buildings, residential units, commercial buildings, new marina, and parks/open space. A residential tower, up to 370 ft (113 m) in height, would be visible in the middle-ground from this vantage point. The Re-Gunning Crane would remain as a highly visible landmark, although Building 253, also a prominent structural feature, would be demolished. However, Building 253 is not considered a scenic resource and, therefore, its removal would not substantially degrade the existing visual character of the project site. The approved HPS Phase I (Parcel A) development, which is not part of this alternative and is currently under construction, would be visible in the middle-ground. Existing views of degraded, vacant, and unmaintained areas would be replaced with well-designed development. Therefore, Alternative 2 would not substantially degrade the existing visual character or quality of the project site or its surroundings from this vantage point. Impacts on visual resources would *not be significant*.

View 2: South from Hilltop Open Space (Figure 4.5.1-9)

Figure 4.5.1-9 depicts views from hilltop open space to be completed as part of HPS Phase I (Parcel A) (not a part of this alternative). Existing structures are visible in the middle-ground, with the Re-Gunning Crane prominent to the south. The bay and Santa Cruz Mountains on the San Francisco Peninsula are visible in the background.

Under Alternative 2, this view would include R&D buildings, roadways, and landscaped areas. The proposed R&D buildings would be taller than existing structures, and would partially obstruct background views of the bay and Santa Cruz Mountains. The view of the Re-Gunning Crane would remain as a landmark. Middle-ground views of degraded and unmaintained areas would be replaced with well-designed development. Therefore, Alternative 2 would not substantially degrade the existing visual character or quality of the project site or its surroundings. Impacts on visual resources from this vantage point would *not be significant*.

Alternative 2 would replace deteriorating structures, vacant parcels, expanses of asphalt/dirt, and piles of debris with a high-quality environment that would include a variety of architectural styles and open space. Therefore, Alternative 2 would not substantially degrade the visual quality or character of project site and/or project vicinity. As with Alternative 1, impacts on visual character would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 2 would not degrade the visual quality or character of project site, and impacts would *not be significant*.

4.5.4.2.4 Factor 4: Effects on Light and Glare

Development under Alternative 2 would increase lighting and the level of illumination on the project site relative to existing conditions. However, impacts from light and glare would be less than those described for Alternative 1 because the extent of illumination would be reduced with the elimination of the stadium.

New buildings would be illuminated externally for security purposes, and other lighting fixtures would be placed in parking areas, public common areas, and walkways to ensure visitor and employee safety. Similar to Alternative 1, lighting fixtures would be of a low intensity, low glare design, and would be shielded to direct light downward and prevent spill-over onto adjacent areas. New construction would include the use of textured or other nonreflective exterior surfaces and nonreflective glass. A lighting plan would be prepared for each sub-phase of the project that includes the location of exterior lighting, types of lighting, and lighting specifications (e.g., beam spreads and/or photometric calculations) (Section 2.3.2.1.9, Environmental Controls). Implementation of these environmental controls would ensure impacts from light and glare would *not be significant*.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 2 would not impact light and glare, and impacts would *not be significant*.

4.5.5 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

4.5.5.1 Construction Impacts

4.5.5.1.1 Factor 1: Effects on Scenic Vistas

As Alternative 2A would have a reduced construction period compared to Alternative 1, impacts on scenic vistas would be similar but less than those described for Alternative 1. Similar to Alternative 1, visual impacts associated with construction activities would include exposed pads and staging areas for grading, excavation, and construction equipment. Construction of the Yosemite Slough bridge would require the use of marine-based construction equipment (e.g., barge/tugboat and crane), which would be visible from public vantage points. These activities could impact views of scenic vistas including the bay, East Bay hills, the San Francisco downtown skyline, Hunters Point Hill, Yosemite Slough, Double Rock, and CPSRA. However, these conditions would be temporary visual distractions typically associated with construction activities encountered in developed areas. Construction activities associated with Alternative 2A would not result in adverse effects on any scenic vistas. Therefore, impacts on scenic vistas would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or Building Preservation option for Alternative 2A would not impact scenic vistas, and impacts would *not be significant*.

4.5.5.1.2 Factor 2: Effects on Scenic Resources

Similar to Alternative 1, proposed construction activities would not affect the Re-Gunning Crane, which would remain intact after implementation of Alternative 2A. In addition, this alternative would retain onsite historic properties (Drydocks 2, 3, and 4 and the Hunters Point Commercial Drydock Historic District). In addition, four structures (Buildings 211, 224, 231, and 253) could be preserved under this alternative. Construction of the Yosemite Slough bridge at the east end of the slough would change the appearance of this scenic resource during construction; however, this would not be a substantial impact as the majority of the slough would be unaffected by proposed development. Therefore, impacts on scenic resources would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or Building Preservation option for Alternative 2A would not impact scenic resources, and impacts would *not be significant*.

4.5.5.1.3 Factor 3: Effects on Visual Character

Alternative 2A construction activities would result in exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and steel plates that would be visible during construction of utility infrastructure and roadway improvements. Although construction activities would occur primarily on site, these activities could be visible from surrounding public vantage points. As with Alternative 1, implementation of environmental controls would reduce impacts during construction by requiring the applicant to screen construction sites from public views at street level and provide appropriate staging of construction equipment; keep the surrounding streets clean and free from construction debris; and maintain the cleanliness of construction equipment (Section 2.3.2.1.9, Environmental Controls). Therefore, impacts on visual character would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or Building Preservation option for Alternative 2A would not impact visual character/quality, and impacts would *not be significant*.

4.5.5.1.4 Factor 4: Effects on Light and Glare

Similar to Alternative 1, the glare created by Alternative 2A construction activities would not be substantial enough to affect daytime views in the area. Security lighting would be provided after-hours on all construction sites, but this lighting would be minimal, restricted to the project site, and would not exceed the level of existing night lighting in surrounding urban areas. As with Alternative 1, impacts from light and glare would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or Building Preservation option for Alternative 2A would not impact light and glare, and impacts would *not be significant*.

4.5.5.2 Operational Impacts

4.5.5.2.1 Factor 1: Effects on Scenic Vistas

Under this alternative, the stadium proposed under Alternative 1 would be replaced within HPS with additional housing and R&D areas emphasizing new technologies. Buildings constructed as part of Alternative 2A would range in height from 40 ft (12 m) to 370 ft (113 m). Maximum building heights for R&D structures west of the buildings (Buildings 211, 224, 231, and 253) that could be preserved under Alternative 2A would increase from 85 ft (26 m) to 120 ft (37 m) to accommodate the displaced R&D uses. A total of 221.8 ac (90 ha) of open space would surround the additional housing, R&D, and neighborhood commercial areas. Alternative 2A would change views of the project site from surrounding public viewpoints, but would not substantially obstruct any scenic vistas. While proposed development would include two high-rise towers, these towers would not be clustered, and would not substantially obstruct, alter, or degrade the quality of views of the bay from any long-range viewpoints. Under this alternative, impacts on scenic vistas would be similar in nature to, but less than those described for Alternative 1 because the extent of new structures and infrastructure would be reduced with the elimination of the stadium.

Similar to Alternative 1, proposed development would not substantially block publicly accessible views of the bay, Yosemite Slough, CPSRA, or other scenic vistas. As with Alternative 1, impacts on scenic vistas would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 2A would not obstruct any scenic vistas, and impacts would *not be significant*.

4.5.5.2.2 Factor 2: Effects on Scenic Resources

Development under Alternative 2A would have a reduced bulk and mass compared to Alternative 1 due to elimination of the stadium and construction of additional housing and R&D areas at HPS. Development under Alternative 2A would not substantially damage scenic resources that contribute to a scenic public setting. Scenic resources at HPS would be retained, including the Re-Gunning Crane and historic properties (Drydocks 2, 3, and 4 and the Hunters Point Commercial Drydock Historic District). In addition, four structures (Buildings 211, 224, 231, and 253) could also be preserved under this alternative. A total of 221.8 ac (90 ha) of new and renovated parkland and open space with improved public access would be constructed, thereby improving the scenic quality of the area.

Alternative 2A would complete the Bay Trail along the waterfront and provide substantial areas of parks and open space that would complement the slough restoration proposed as part of the Yosemite Slough Restoration Project. The Yosemite Slough bridge would alter the visual character of a portion of the slough and would partially obstruct views of Yosemite Slough and the bay from some public vantage points. Under Alternative 2A, the bridge width would be reduced to 39 ft (12 m) because the additional four vehicle lanes required to accommodate game day traffic under Alternative 1 would not be constructed. Similar to Alternative 1, views of Yosemite Slough and the bay would be visible from the bridge and proposed improved shoreline areas, which would provide viewing opportunities not currently available. The bridge would not substantially obstruct views of Yosemite Slough or San Francisco Bay or damage a scenic resource because the bridge would be designed with a low profile and would be visually integrated into the environment to the extent feasible. Similar to Alternative 1, implementation of Alternative 2A would not damage or remove any scenic resources that contribute to a scenic public setting. Therefore, impacts on scenic resources would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 2A would not adversely impact a scenic resource or other feature that contributes to a scenic public setting, and impacts would *not be significant*.

4.5.5.2.3 Factor 3: Effects on Visual Character

Under this alternative, impacts on visual character would be reduced compared to Alternative 1 because the extent of new structures and infrastructure massing would be minimized with elimination of the stadium. Similar to Alternative 1, Alternative 2A would not substantially degrade the visual character or quality of the project site or project vicinity. In fact, development under Alternative 2A would improve the degraded and deteriorated condition of the project site. The proposed shoreline improvements would improve the visual quality of the shoreline by reducing erosion and removing debris. As with Alternative 1, impacts on visual character would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 2A would not degrade the visual quality or character of the project site, and impacts would *not be significant*.

4.5.5.2.4 Factor 4: Effects on Light and Glare

Development under Alternative 2A would increase lighting and the level of illumination on the project site relative to existing conditions. However, impacts from light and glare would be less than those described for Alternative 1 because the extent of illumination would be reduced with the elimination of the stadium. Similar to Alternative 1, lighting fixtures would be of a low intensity, low glare design, and would be shielded to direct light downward and prevent spill-over onto adjacent areas. New construction would include the use of textured or other nonreflective exterior surfaces and nonreflective glass. A lighting plan would be prepared for each sub-phase of the project that includes the location of exterior lighting, types of lighting, and lighting specifications (e.g., beam spreads and/or photometric calculations) (Section 2.3.2.1.9, Environmental Controls). Implementation of these environmental controls would ensure impacts from light and glare would *not be significant*.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 2A would not impact light and glare, and impacts would *not be significant*.

4.5.6 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

4.5.6.1 Construction Impacts

4.5.6.1.1 Factor 1: Effects on Scenic Vistas

As Alternative 3 would have a reduced construction period compared to Alternative 1, impacts on scenic vistas would be similar but less than those described for Alternative 1. Similar to Alternative 1, visual impacts associated with construction activities would include exposed pads and staging areas for grading, excavation, and construction equipment. Construction of the Yosemite Slough bridge would require the use of marine-based construction equipment (e.g., barge/tugboat and crane), which would be visible from public vantage points. Although these activities would occur primarily within the project site, they would be visible from surrounding public vantage points. However, these visual conditions would be temporary visual distractions typically associated with construction activities encountered in developed areas. Furthermore, temporary conditions (e.g., bulldozers, trenching equipment, generators, trucks, and marine-based construction equipment) would not substantially obstruct views of the bay, Yosemite Slough, Double Rock, CPSRA, East Bay hills, or the San Francisco downtown skyline. Therefore, impacts on scenic vistas would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or Building Preservation option for Alternative 3 would not impact scenic vistas, and impacts would *not be significant*.

4.5.6.1.2 Factor 2: Effects on Scenic Resources

Proposed construction activities would not affect scenic resources in the project site areas, including the Re-Gunning Crane or historic properties (Drydocks 2, 3, and 4 and the Hunters Point Commercial Drydock Historic District). In addition, four structures (Buildings 211, 224, 231, and 253) could be preserved under this alternative. Construction of the Yosemite Slough bridge at the east end of the slough would not substantially damage this scenic resource during construction, as the vast majority of the slough would be unaffected by proposed development. Therefore, impacts on scenic resources would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or Building Preservation option for Alternative 3 would not impact scenic resources, and impacts would *not be significant*.

4.5.6.1.3 Factor 3: Effects on Visual Character

Similar to Alternative 1, construction activities for Alternative 3 would result in exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and steel plates that would be visible during construction of utility infrastructure and roadway improvements. Although construction would occur primarily on site, these activities could be visible from surrounding public vantage points. As with Alternative 1, implementation of environmental controls requiring the applicant to stage all construction equipment on the project site, maintain the cleanliness of construction equipment, and sweep surrounding streets of mud and debris caused by construction vehicles (Section 2.3.2.1.9, Environmental Controls), would minimize temporary impacts during construction. Similar to Alternative 1, impacts on visual character would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or Building Preservation option for Alternative 3 would not impact visual character/quality, and impacts would *not be significant*.

4.5.6.1.4 Factor 4: Effects on Light and Glare

Similar to Alternative 1, the glare created by Alternative 3 construction activities at the project site would not be substantial enough to affect daytime views in the area. Security lighting would be provided after-hours on all construction sites, but this lighting would be minimal, restricted to the project site, and would not exceed the level of existing night lighting in surrounding urban areas. Similar to Alternative 1, impacts from light and glare would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or Building Preservation option for Alternative 3 would not impact light and glare, and impacts would *not be significant*.

4.5.6.2 Operational Impacts

4.5.6.2.1 Factor 1: Effects on Scenic Vistas

Development under Alternative 3 would have a reduced bulk and mass compared to Alternative 1. Under this alternative, the stadium proposed under Alternative 1 would be replaced with 1,350 residential units at HPS. Buildings constructed as part of Alternative 3 would range in height from 40 ft (12 m) to 370 ft (113 m). Maximum building heights for R&D structures west of the buildings (Buildings 211, 224, 231, and 253) that could be preserved under Alternative 3 would increase from 85 ft (26 m) to 120 ft (37 m) to accommodate the displaced R&D uses. Alternative 3 would include a total of 244.6 ac (99 ha) of parks and open space. Alternative 3 would change views of the project site from surrounding public viewpoints, but would not substantially obstruct any scenic vistas. While proposed development would include two high-rise towers, these towers would not be clustered, and would not substantially obstruct, alter, or degrade the quality of views of the bay from any long-range viewpoints. Views of the bay and East Bay from the project site would be maintained within public access areas, including CPSRA (Figure 4.5.1-10) and HPS Phase I (Parcel A) Hilltop Open Space (Figure 4.5.1-11). Under this alternative, impacts on scenic vistas would be similar in nature to, but less than those described for Alternative 1 because the extent of new structures and infrastructure would be reduced with the elimination of the stadium. Similar to Alternative 1, impacts on scenic vistas would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 3 would not obstruct any scenic vistas, and impacts would *not be significant*.

4.5.6.2.2 Factor 2: Effects on Scenic Resources

Proposed development under Alternative 3 would have a reduced bulk and mass compared to Alternative 1, as described above, due to elimination of the stadium and construction of additional residential units at HPS. Development under Alternative 3 would not substantially damage scenic resources that contribute to a scenic public setting. Scenic resources at HPS would be retained, including the Re-Gunning Crane and historic properties (Drydocks 2, 3, and 4 and the Hunters Point Commercial Drydock Historic District). In addition, four structures (Buildings 211, 224, 231, and 253) could be preserved under this alternative. Under this alternative, a total of 244.6 ac (99 ha) of new and renovated parkland and open space, with improved public access would be constructed, thereby improving the scenic quality of the area.

This alternative would complete the Bay Trail along the waterfront and provide substantial areas of parks and open space that would complement the slough restoration proposed as part of the Yosemite Slough Restoration Project. Under Alternative 3, the bridge width would be reduced to 39 ft (12 m) because the additional four vehicle lanes required to accommodate game day traffic under Alternative 1 would not be constructed. Similar to Alternative 1, views of Yosemite Slough and the bay would be visible from the bridge and proposed improved shoreline areas, which would provide viewing opportunities not currently available. The bridge would not substantially obstruct views of Yosemite Slough or San Francisco Bay or damage a scenic resource because the bridge would be designed with a low profile and would be visually integrated into the environment to the extent feasible. Similar to Alternative 1, implementation of Alternative 3 would not damage or remove any scenic resources that contribute to a scenic public setting. Therefore, impacts on scenic resources would *not be significant*, and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 3 would not adversely impact a scenic resource or other feature that contributes to a scenic public setting, and impacts would *not be significant*.

4.5.6.2.3 Factor 3: Effects on Visual Character

Under this alternative, impacts on visual character would be similar in nature to, but slightly less than those described for Alternative 1 because the extent of new structures and infrastructure massing would be reduced with the elimination of the stadium. Similar to Alternative 1, Alternative 3 would not substantially degrade the visual character or quality of the project site or project vicinity. In contrast, Alternative 3 would improve the degraded and deteriorated condition of the project site. Development under Alternative 3 would replace the existing conditions with a more dense urban setting, but would not represent an adverse change. The proposed shoreline improvements would improve the visual quality of the shoreline by reducing erosion and removing debris.

The visual impacts that would result from Alternative 3 would depend on the specific location and elevation of the observer, as discussed below.

View 1: Northeast from CPSRA (Figure 4.5.1-10)

Looking northeast to HPS from the eastern portion of CPSRA, views of the bay and existing HPS buildings are prominent in the foreground (Figure 4.5-10). Proposed development would include residential units, R&D areas, neighborhood retail, parks and open space, and a marina. A residential tower, up to 370 ft (113 m) in height, would be visible beyond residential and neighborhood retail development from this vantage point. The Re-Gunning Crane would remain as a highly visible landmark, although Building 253, also a prominent structural feature, would be demolished. However, Building 253 is not considered a scenic resource and, therefore, its removal would not substantially degrade the existing visual character of the project site. The approved HPS Phase I (Parcel A) development, which is not part of this alternative and is currently under construction, would be visible in the middle-ground. Existing views of degraded, vacant, and unmaintained areas would be replaced with well-designed development. Therefore, Alternative 3 would not substantially degrade the existing visual character or quality of the project site or its surroundings from this vantage point. Impacts on visual resources from this vantage point would *not be significant.*

View 2: South from Hilltop Open Space (Figure 4.5.1-11)

Figure 4.5-11 depicts views from hilltop open space to be completed as part of HPS Phase I (Parcel A) (not a part of this alternative). Existing structures are visible in the middle-ground, with the Re-Gunning Crane prominent to the south. The bay and Santa Cruz Mountains on the San Francisco Peninsula are visible in the background. Under Alternative 3, this view would include R&D areas, community facilities, roadways, and landscaped areas. R&D development would partially obstruct background views of San Francisco Bay and the Santa Cruz Mountains. Middle-ground views of degraded and unmaintained areas would be replaced with well-designed development. Therefore, Alternative 3 would not substantially degrade the existing visual character or quality of the project site or its surroundings. Impacts on visual resources from this vantage point would *not be significant*.

Overall, Alternative 3 would improve the visual appearance of the project site by removing deteriorated structures and enhancing neighborhood shoreline access. Similar to Alternative 1, impacts on visual character would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 3 would not degrade the visual quality or character of project site, and impacts would *not be significant*.

4.5.6.2.4 Factor 4: Effects on Light and Glare

Development under Alternative 3 would increase lighting and the level of illumination on the project site relative to existing conditions. However, impacts from light and glare would be slightly less than those described for Alternative 1 because the extent of illumination would be reduced with the elimination of the stadium. New buildings would be illuminated externally for security purposes, and other lighting fixtures would be placed in parking areas, public common areas, and walkways to ensure visitor and employee safety. Implementation of environmental controls would reduce impacts from light and glare by shielding lighting fixtures, minimizing spill light from proposed lighting, screening vehicle headlights to the maximum extent feasible, and eliminating or minimizing increased glare by using nonreflective glass and nonreflective textured surfaces in the proposed development (Section 2.3.2.1.9, Environmental Controls). As with Alternative 1, impacts would *not be significant* under Alternative 3, and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or Building Preservation option for Alternative 3 would not impact light and glare, and impacts would *not be significant*.

4.5.7 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

4.5.7.1 Construction Impacts

4.5.7.1.1 Factor 1: Effects on Scenic Vistas

As Alternative 4 would have a reduced construction period compared to Alternative 1, impacts on scenic vistas would be similar but less than those described for Alternative 1. Similar to Alternative 1, construction activities would be visible to surrounding land uses and could impact views of scenic vistas in the project site area. However, these visual conditions would be temporary and are typically associated with construction activities encountered in developed areas, and would not result in adverse effects on any scenic vistas. Therefore, impacts on scenic vistas would *not be significant,* and no mitigation is proposed.

4.5.7.1.2 Factor 2: Effects on Scenic Resources

There are no scenic resources on the project site that would be adversely affected by construction of Alternative 4. Under this alternative, impacts on scenic resources would be similar to but less than those described for Alternative 1 because the Yosemite Slough bridge, stadium, and marina would not be constructed. This condition would minimize temporary impacts on surrounding scenic resources, including San Francisco Bay, Yosemite Slough, Double Rock, and CPSRA. Impacts on scenic resources, including Yosemite Slough, Double Rock, and CPSRA shoreline, would be substantially reduced as the appearance of the slough would not be altered by construction of a bridge. As with Alternative 1, impacts on scenic resources would *not be significant* and no mitigation is proposed.

4.5.7.1.3 Factor 3: Effects on Visual Character

Construction activities for Alternative 4 would result in exposed trenches, roadway bedding (soil and gravel), spoils/debris piles, and steel plates that would be visible during construction of utility infrastructure and roadway improvements. Although construction activities would occur primarily on site, these activities could be visible from surrounding public vantage points. As with Alternative 1, implementation of environmental controls would reduce impacts during construction by requiring the applicant to screen construction sites from public views at street level; provide appropriate onsite staging of construction equipment; keep the surrounding streets clean and free from construction debris; and maintain the cleanliness of construction equipment (Section 2.3.2.1.9, Environmental Controls). Furthermore, impacts on visual character would be similar but less than those described for Alternative 1 because the extent of construction activity causing short-term impacts would be reduced with the elimination of the Yosemite Slough bridge, marina, and stadium. Similar to Alternative 1, impacts on visual character would *not be significant* and no mitigation is proposed.

4.5.7.1.4 Factor 4: Effects on Light and Glare

Similar to Alternative 1, the glare created by Alternative 4 construction activities at the project site would not be substantial enough to affect daytime views in the area. Security lighting would be provided after-hours on all construction sites, but this lighting would be minimal, restricted to the project site, and would not exceed the level of existing night lighting in surrounding urban areas. Under this alternative, impacts from light and glare would be similar but less than those described for Alternative 1 because the extent of construction activity causing short-term impacts would be reduced with the elimination of the Yosemite Slough bridge, marina, and stadium. Similar to Alternative 1, impacts from light and glare would be *not significant* and no mitigation is proposed.

4.5.7.2 Operational Impacts

4.5.7.2.1 Factor 1: Effects on Scenic Vistas

Development under Alternative 4 would have a reduced bulk and mass compared to Alternative 1. Under this alternative, no residential towers would be constructed at HPS. Alternative 4 would change views of the project site from surrounding public viewpoints, but would not substantially obstruct any scenic vistas. Under this alternative, impacts on scenic vistas would be similar but less than those described for Alternative 1 because the extent of new structures and infrastructure would be reduced with the elimination of the Yosemite Slough bridge, marina, stadium, and residential units.

Similar to Alternative 1, proposed development would not block publicly accessible views of the bay or other scenic vistas. Therefore, development under this alternative would not substantially obstruct any scenic vistas. As with Alternative 1, impacts on scenic vistas would *not be significant* and no mitigation is proposed.

4.5.7.2.2 Factor 2: Effects on Scenic Resources

Development under Alternative 4 would have a reduced bulk and mass compared to Alternative 1, as described above, due to elimination of the Yosemite Slough bridge, marina, stadium, and residential units. Development under Alternative 4 would not substantially damage scenic resources that contribute to a scenic public setting. As the Yosemite Slough bridge and roadway approaches would not be constructed, the appearance of the slough would remain unchanged. Scenic resources at HPS would be retained, including the Re-Gunning Crane. Shoreline improvements at HPS would improve the visual quality of the shoreline by reducing erosion and removing debris. Similar to Alternative 1, implementation of Alternative 4 would not damage or remove any scenic resources that contribute to a scenic public setting. Impacts on scenic resources would *not be significant* and no mitigation is proposed.

4.5.7.2.3 Factor 3: Effects on Visual Character

Under this alternative, impacts on visual character would be similar to but less than those described for Alternative 1 because the extent of new structures and infrastructure massing would be reduced with the elimination of the Yosemite Slough bridge, marina, stadium, and residential units. Similar to Alternative 1, Alternative 4 would not substantially degrade the visual character or quality of the project site or project vicinity. In fact, development under Alternative 4 would improve the degraded and deteriorated condition of the project site. Development under Alternative 4 would replace the existing conditions with a more dense urban setting, but would not represent an adverse change. The proposed shoreline improvements would improve the visual quality of the shoreline by reducing erosion and removing debris. As with Alternative 1, impacts on visual character would *not be significant* and no mitigation is proposed.

4.5.7.2.4 Factor 4: Effects on Light and Glare

Development under Alternative 4 would increase lighting and the level of illumination on the project site relative to existing conditions. However, impacts from light and glare would be less than those described for Alternative 1 because the extent of illumination would be reduced with the elimination of the Yosemite Slough bridge, marina, stadium, and residential units.

Project lighting would be used to highlight architectural elements, landscaping, and signage. In addition, new buildings would be illuminated externally for security purposes, and other lighting fixtures would be placed in parking areas, public common areas, and walkways to ensure visitor and employee safety.

Similar to Alternative 1, lighting fixtures would be of a low intensity, low glare design, and would be shielded to direct light downward and prevent spill-over onto adjacent areas. New construction would include the use of textured or other nonreflective exterior surfaces and nonreflective glass. A lighting plan would be prepared for each sub-phase of the project. Lighting plans would include the location of exterior lighting, types of lighting, and lighting specifications (e.g., beam spreads and/or photometric calculations) (Section 2.3.2.1.9, Environmental Controls). As with Alternative 1, implementation of these environmental controls would ensure impacts from light and glare would *not be significant*.

4.5.8 No Action Alternative

Under the No Action Alternative, the project site would not be disposed of by the DoN for subsequent reuse, and would remain as a closed federal property under caretaker status. No construction or operation activities, or changes to the existing buildings and infrastructure would occur at the project site. Existing conditions would remain as described in Section 3.5, Visual Resources and Aesthetics, and aesthetic environment would remain unchanged. Therefore, *no impacts* on visual resources/aesthetics would occur under the No Action Alternative.

4.5.9 Mitigation

The proposed action and alternatives would not result in significant impacts to visual resources and aesthetics. No mitigation is proposed.

4.6 Socioeconomics

This section evaluates the potential for project level impacts on social and economic conditions. The region of influence for socioeconomic impacts is the HPS site, the BVHP neighborhood, the City and County of San Francisco, and San Mateo County.

The report *Fiscal and Economic Impact Analysis of the Candlestick Point-Hunters Point Shipyard Phase II Development Project* was prepared by Economic & Planning Systems, Inc. for Lennar Communities, the project developer (Economic & Planning Systems 2010). The analysis combined both the Candlestick Point and HPS developments. It concluded that fiscal impacts on the city would be favorable because revenues generated by the project would substantially exceed the costs of providing services to the development in all future years. Also, the direct and induced economic impacts related to jobs creation, construction workforce, and business activity were all found to be favorable for the combined projects. While the HPS contribution to these favorable conclusions was not identified in the report, it is reasonable to conclude that the HPS development on its own would have similar overall favorable fiscal and economic impacts. Note also that federal properties are exempt from local taxes. As such, the conversion of federal property to taxable property within the city's jurisdiction would result in an increase in property tax revenues. Also, the addition of businesses and retail sources of sales tax revenues would enhance local jurisdiction revenues. This conclusion would apply to all alternatives except the No Action Alternative, for which no increased economic activity would occur. However, because the analyses for Candlestick Point and Hunters Point Shipyard were combined, HPS-specific fiscal or economic impacts are not quantified.

4.6.1 Methodology

4.6.1.1 Factors of Significance

There is no quantitative guidance that defines significant social and economic impacts under NEPA. No regulations or laws dictate specific quantitative criteria for determining the significance of socioeconomic impacts. However, factors considered in determining whether an alternative would have a significant socioeconomic impact include the extent or degree to which implementation of the alternative would result in the following effects:

Factor 1 Substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); or the creation of demand for additional housing, necessitating the construction of replacement housing;

Factor 2 Displacement of substantial numbers of existing housing units or resident population, either directly (e.g., acquisition of land that contains housing in order to build new uses) or indirectly (e.g., contribution to rising home prices that eventually result in displacement of existing residents);

Factor 3 Displacement of a substantial number of businesses, resulting in the loss of a significant amount of employment opportunities and/or the provision of essential services; or, similarly, loss of access to businesses that represent both employment centers and provision of essential services; and/or

Factor 4 Inconsistency of proposed reuse with relevant elements of adopted general plans.

4.6.1.2 Analytic Method

The analysis compares socioeconomic conditions in the construction and operation phase for each alternative against the baseline condition, which is defined as conditions in 2007. Since the latest available data for the BVHP neighborhood are from 2000, those data are used as the baseline for impact analysis in that neighborhood and compared to 2000 data from the other communities for consistency.

The analysis considers both direct and indirect impacts that could result from the alternatives. For example, in the case of population growth, direct population growth would include the residents and employees who would occupy the new homes and businesses developed at the HPS site, as well as temporary construction employment. Indirect growth may occur as other businesses arise to serve new residents, or as "leapfrog" development – that is, development that may occur in suburban areas adjacent to or near previously undeveloped lands, as infrastructure is expanded to previously unserved areas.

The focus of the analysis is on impacts related to the significance factors listed above. In the context of population growth, "substantial" growth means increases in population that are unplanned, without consideration of or planning for infrastructure, services, and housing needed to support new residents, employees, and visitors.

The analysis of housing and population displacement, and demand for additional housing, considers temporary (construction-related) impacts as well as permanent impacts, such as displacement. Displacement of residents would be considered to occur if residents were forced to leave their homes without being provided with temporary housing, monetary compensation, or some other form of mitigation to help with the relocation process and if they were not given the right to return. Displacement of housing units would occur if housing units were demolished and replaced with an alternative land use. Displacement is usually classified as a construction impact because most residential and business displacements occur prior to or during construction of the alternative; however, unlike most construction phase impacts, it is a permanent impact. In addition to displacement, this section of the analysis also includes the potential for the alternatives to create substantial additional demand for housing units due to a substantial increase in employment opportunities that the current population may not support.

The analysis also considers the possibility of displacement of residents via indirect means, namely the potential for new market-rate housing units, or new job opportunities, to lead to increased numbers of wealthier and higher-skilled residents and the eventual displacement of poorer and working-class residents as housing prices rise. This process, commonly referred to as gentrification, sometimes occurs as a result of construction of new housing - especially new market-rate housing without provision of adequate levels of affordable units - or new employment centers that encourage move-in by highly educated and highly skilled workers. The potential for the alternatives to lead to displacement of existing residents via this process is addressed in Factor 2, within the "Operational Impacts" section.

The analysis of impacts on businesses focuses on the potential for the alternatives to reduce access to employment opportunities or essential services. This includes impacts that could occur temporarily, in the construction phase (e.g., construction activities that create substantial or long-lasting traffic barriers), or permanently (e.g., property acquisition that forces the relocation of businesses). Substantial impacts are those that would result in a measurable decrease in regional employment, or the displacement or other loss of businesses that provide essential services to a neighborhood and for which no opportunities for replacement of the services are provided.

Consistency with adopted elements of the San Francisco General Plan is considered. Because plan consistency is a concept that includes the project in its totality, consistency is addressed in the section on operational impacts, although the analysis also incorporates construction-phase effects where appropriate.

The degree to which the alternatives may contribute to cumulative socioeconomic impacts, in the context of existing, proposed, and reasonably foreseeable future development expected in the city is addressed in Chapter 5, Cumulative Impacts.

4.6.2 Alternative 1: Stadium Plan Alternative

4.6.2.1 Construction Impacts

4.6.2.1.1 Factor 1: Population and Housing Growth

There would be direct, but temporary, construction job growth at the project site as a result of Alternative 1. Construction is expected to continue through 2031. The schedule will vary from year to year as phases and components within phases are constructed over time. The total construction workforce onsite is expected to fluctuate from a high of 342 persons to a low of as few as 16. The average daily workforce is expected to vary from as few as 14 to a high of 275 per day over construction periods involving several months or more.

Construction hiring policies associated with Alternative 1 would aim to maximize hiring among local residents. The policy would be similar to that for the current HPS Phase I development, which requires the construction contractor and its subcontractors to make a good faith effort to have 50 percent of all construction workforce hours completed by San Francisco residents, with first consideration given to District 10 residents (i.e., ZIP Codes 94124, 94134, and 94107). (ZIP Code 94124 includes the BVHP neighborhood; it is bounded on the north by Cesar Chavez St, on the west by Route 101, and on the east and south by San Francisco Bay. ZIP Code 94134 lies immediately to the west of 94124 and roughly includes the neighborhoods of Portola and Visitacion Valley. ZIP Code 94107 lies immediately to the north of 94124, and includes the Potrero and Central Waterfront neighborhoods; it is bounded on the west by Route 101 and on the north by UCSF.) In 2009, 53 percent of all construction workforce hours within the HPS Phase I project site were completed by San Francisco residents (Garcia 2010).

It is likely that construction employees not already living in the BVHP neighborhood would commute from elsewhere in the Bay Area rather than relocate to the BVHP neighborhood for a temporary construction assignment. Thus, development of the proposed project would not generate a substantial, unplanned population increase, or a related demand for additional housing units. Therefore, impacts associated with construction employment would *not be significant*, and no mitigation is proposed.

4.6.2.1.2 Factor 2: Displacement of Housing and Population

There are no existing housing units at HPS. Therefore, build-out of Alternative 1 would not replace housing units with new uses, and no existing residents would be displaced. Because there would be no residential displacement at HPS, development of Alternative 1 would have *no impact* on displacement of housing and residents at this site. Therefore, no mitigation is proposed.

4.6.2.1.3 Factor 3: Displacement of Businesses

As discussed in Section 3.6.3.3, Employment and Income, existing employment in the project site consists of about 100 studio artists, as well as a small number of contract and temporary jobs (about 16 full-time equivalent jobs) associated with security, maintenance, and environmental cleanup. Alternative 1 would include the demolition of some existing artists' studios and renovation of others, as well as the construction of new buildings to be used as artists' studios. Space dedicated to artists' studios and an art center would increase from the current 85,121 ft^2 (7,916 m^2) to 255,000 ft^2 (23,700 m^2). Thus, this alternative would not result in a net loss of employment for the about 100 studio artists presently working on the project site. Depending on the difference in costs to rent existing studios versus costs to rent the new studios, the displacement and relocation could have an adverse effect on the studio artist population if the new studios are less affordable. However, in accordance with Section 3.4(a) Arts and Cultural Facilities of the Community Benefits Plan that is Appendix O, which is part of the Disposition and Development Agreement (SFRA 2011), an Artists Relocation Plan would be developed by the City and County of San Francisco, together with artists and other entities, to ensure that existing artists who are already occupying space at HPS will be given the opportunity to move to the New Shipyard Artists Studios. Also, to minimize artist rents but reimburse the City and County of San Francisco for its costs, the City and County of San Francisco would lease the studios at no more than what is required to cover the City and County of San Francisco costs. Additional elements of the Community Benefits Plan address temporary relocation of artists (if needed), the Developer providing at no cost to the City and County of San Francisco a parcel of land for possible future construction of an Arts Center, and inclusion of Arts District Design Elements that would provide opportunities for artists to display art on the Project Site. Taking the various elements of the Arts and Cultural Facilities component of the Community Benefits Plan into consideration, implementation would help to ensure that the impact of displacement of existing artists' studios would *not be significant*. Therefore, no mitigation is proposed.

Construction activities would result in some temporary disruptions to traffic flows, both within the HPS development area and on nearby roadways that provide access to the redevelopment area. Additional traffic from construction vehicles and workers would adversely affect roadway capacity and could lead to delays due to traffic diversions and the increase in truck traffic. This could lead to minor impacts on access to businesses in the area, which could result in minor impacts on their viability. However, because of the peninsular geography of the HPS site and the fact that a limited number of businesses are located on or immediately adjacent to the site, it is expected that access disruptions would not affect the economic viability of businesses in the analysis area. Therefore, impacts would *not be significant* and no mitigation is proposed. Section 4.1, Transportation, Traffic, and Circulation provides additional information about transportation conditions, impacts, and proposed mitigation measures.

4.6.2.2 Operational Impacts

4.6.2.2.1 Factor 1: Population and Housing Growth

Direct

Direct population growth at HPS would include the residents and employees who would occupy the new homes and businesses developed at this site. Alternative 1 would involve the construction of 2,650 housing units at HPS. At full build-out in 2030, the population at HPS would be 6,175 residents, based on a factor of 2.33 persons per household (Section 3.6.3.1.2, Bayview Hunters Point Neighborhood and Project Site). Alternative 1 would also include development of new retail, R&D, and other uses, resulting in an estimated 7,255 new jobs (Table 4.6.2-1). In total, the population at HPS would represent 0.7 percent of the estimated citywide population of 916,800 in 2030, while employment would represent 1.0 percent of the 748,100 jobs in 2030.

Although Alternative 1 would result in an increase in population and employment at HPS, growth in this area has long been the subject of many planning activities. Planning activities pertaining to HPS date to 1969 preceding closure of the HPS naval shipyard. As a result of these ongoing planning activities, service providers in the City of San Francisco have been aware of the likely redevelopment, and have included future growth projections for HPS in their long-term operations plans. Planning department population projections (personal communication, Rahaim 2009) include the population growth associated with Alternative 1 and are the basis of the San Francisco Public Utilities Commission's *Water Supply Availability Study* (PBS&J 2009a). In addition, the Southeast Water Pollution Control Plant has capacity to treat wastewater from the project site. Alternative 1 would provide all onsite infrastructure for connections to city mains, and would include onsite treatment of stormwater runoff (see Section 3.10, Utilities and Section 3.11, Public Services for further description of the potential impacts of this alternative on infrastructure and services). In summary, the infrastructure needed to support the level of growth anticipated under Alternative 1 was planned based on population projections that included the housing and employment associated with the HPS redevelopment.

Table 4.6.2-1. Operation Phase Project Employment in Alternative 1

Land Use	*Employment Factor[1]*	*Development Program in Alternative 1*	*Employment in Alternative 1 (jobs)*
Residential	25 units/job	2,650 units	106
Neighborhood Retail	270 gft^2/job	125,000 gft^2	463
Research and Development	400 gft^2/job	2,500,000 gft^2	6,250
Football Stadium	2,915 jobs/event[2]	32 events/year[2]	359
Public Parking (Commercial and General)	270 spaces/job[3]	4,711 spaces	17
Parks and Open Space	0.26 jobs/ac[3]	231.6 ac	60
Total			**7,255**

Notes:

1. Employment factors are from San Francisco Planning Department (2002) except as noted.
2. Based on data provided by the 49ers. The employment projections are based on 12 football games and 20 additional events annually and 8-hour work shifts. The total excludes media jobs. A full-time equivalent is equal to 2,080 hours per year.
3. Employment factors provided by Economic & Planning Systems 2009.

Employment growth at HPS would be considered substantial if it resulted in housing demand that would exceed planned regional housing development. As reported in Table 4.6.2-2, Alternative 1 would result in 7,255 new jobs. Based on the Planning Department's projection of the number of workers in the average city household in 2025, the average household would be expected to have 1.36 workers (San Francisco Planning Department 2004a, Table I-14). (Note that no forecast data are available for 2030.) This implies that each new job results in a need for 0.74 housing units. Consistent with existing commuting patterns described in Section 3.6.3.3, Employment and Income, it is assumed that 55 percent of the workers would seek housing in the City of San Francisco (USDOT 2006). The calculations also assume a vacancy rate of 4.7 percent (California Department of Finance 2009). Based on these assumptions, the development at HPS would result in a total demand for 5,585 housing units as a result of employment at HPS, including 3,072 units within San Francisco and 2,513 units outside the city.

Table 4.6.2-2. Alternative 1 Housing Demand

Item	*Estimate*	*Notes*
New employment	7,255 jobs	See Table 4.6.2-1.
Housing demand	5,585 units	Calculated as project employment divided by 1.36 workers per housing unit, and plus additional 4.7 percent housing units to account for vacancy rate.
Housing demand in San Francisco	3,072 units	Calculated as housing demand times 55 percent, representing the fraction of workers assumed to seek housing in San Francisco.
Housing demand in other communities	2,513 units	Calculated as housing demand times 45 percent, representing the fraction of workers assumed to seek housing outside San Francisco.

Note:

Factor of 1.36 workers per housing unit is from San Francisco Planning Department 2004a, Table I-14. Vacancy rate of 4.7 percent is from California Department of Finance 2009. Fraction of workers assumed to seek housing within and outside San Francisco is from USDOT 2006.

It should be noted that one of the objectives of this alternative is to provide employment opportunities for existing residents in the BVHP neighborhood. Thus, it is anticipated that some of the future employees at HPS would include residents already living in the neighborhood. Although total housing demand could include existing households, this analysis conservatively assumes that all housing demand generated by Alternative 1 would need to be accommodated by new units.

Total demand for housing at HPS would represent 2.6 percent of the total Bay Area housing need of 214,500 units (based on the RHNA targets; refer to Section 3.6.3.2.3, Regional Housing Needs) projected by ABAG through 2014. (Note that the RHNP is updated every five years and does not extend through 2030.) While much of the population increase associated with employment at HPS could be accommodated at the project site, it is likely that some employees would elect to live elsewhere in the city or within surrounding Bay Area communities.

Based on existing commuting patterns, 3,072 housing units would be required in San Francisco to meet anticipated housing demand. The 2,650 housing units that would be developed at HPS would be less than the total demand for new units generated by employment at HPS; however, units being constructed at other nearby projects (such as Candlestick Point) would offset HPS housing demand. (The analysis of cumulative project impacts in Chapter 5 discusses the neighboring projects and cumulative impacts in more detail.) A broad range of housing options of varying sizes, types, and levels of affordability would be developed at HPS Phase I (which is addressed in the 2000 FEIS and is presently under development), HPS (the subject of the present SEIS), and at Candlestick Point, which is the subject of an EIR prepared by the City and County of San Francisco. Because the new housing would be close to the jobs provided by Alternative 1, future employees at HPS may be more likely to seek housing at nearby developments (i.e., in proximity to the project site) prior to searching for housing in the surrounding BVHP neighborhood. In addition, the housing provided at HPS would be available to existing residents of the BVHP neighborhood should neighborhood residents wish to relocate to the project site.

A percentage of the persons employed at HPS would also likely choose to live in other areas in the City of San Francisco, or other cities in the Bay Area, for various personal and socioeconomic reasons. Based on existing commuting patterns, the demand for about 2,513 units would be generated in surrounding Bay Area communities by HPS development. This housing demand would be dispersed throughout the nine-county Bay Area, which would result in negligible potential increases in housing demand within the Bay Area.

It is not anticipated that employment at HPS would create a substantial demand for housing in the BVHP neighborhood, San Francisco, or the region in excess of the housing provided as part of Alternative 1 or the housing otherwise available in the Bay Area. To summarize, the need for infrastructure, public services, and housing associated with direct population growth proposed at HPS has been anticipated in ongoing local and regional planning activities. All impacts associated with direct population growth are considered *not significant* for HPS. Therefore, no mitigation is proposed.

Indirect

As infrastructure, public services, roads, and other services and communities amenities are expanded, there would also be a potential for the development at HPS to generate indirect population growth. Indirect growth is often defined as “leapfrog” development that occurs as infrastructure is expanded to previously unserved or underserved areas. Such development patterns usually occur in suburban areas adjacent to undeveloped lands. Areas surrounding the project site are built out, except for sites such as India Basin that are currently undergoing development or are the subject of planned future development. Thus, the surrounding lands are not vulnerable to leapfrog-type development.

Infrastructure and services would be expanded to serve HPS, without significant excess capacity that might encourage additional local growth beyond that already planned for under Proposition G and under the redevelopment plans. The development at HPS would not expand infrastructure to geographic areas that were not previously served, nor would it create new transportation access to a previously inaccessible area. All impacts associated with indirect population growth are considered *not significant* for HPS. Therefore, no mitigation is proposed.

4.6.2.2.2 Factor 2: Displacement of Housing and Population

There would be no direct impacts related to displacement of existing structures because the HPS site does not contain housing units. However, there is a potential for Alternative 1 to have indirect impacts related to displacement of existing residents. The alternative involves construction of 2,650 housing units, including 457 affordable units. Table 4.6.2-3 provides a summary of the proposed affordable and below market rate units for Alternative 1. As indicated in Table 4.6.2-3, 17 percent of the units would be affordable and 21 percent would be below market rate. These figures exceed the requirements for SFRA affordable housing within Redevelopment Project Areas, which state that at least 15 percent (398) of all new units within the redevelopment areas must be affordable.

Table 4.6.2-3. Proposed Affordable Housing Mix for Alternative 1

Description	*Units*
Total Housing Units Proposed	2,650
15% of Total Units (SFRA affordable housing requirement)	398
Proposed Agency Affordable Units	221
Proposed Inclusionary Units	236
SFRA Affordable Subtotal	457
Proposed SFRA Affordable Units (percent of total units)	17%
Workforce Units	102
Total Below Market Units	559
Proposed Below Market (percent of total units)	21%

Source: SFRA 2010.

In addition, under the project proposed in the EIR for HPS and the Candlestick Point redevelopment, the city would construct a total of 10,244 new units, including 3,089 (or about 30 percent) new affordable and below-market housing units (SFRA 2009, Table II-2). Even so, the overall redevelopment plan at HPS Phases I and II has the potential to lead to a general increase in rent levels or in neighborhood property values for homeowners (and therefore property taxes which existing residents – especially those on low or fixed incomes – may be unable to pay).

Alternative 1 therefore has the potential to lead to displacement of existing residents if the employment opportunities associated with the project would lead to a disproportionate inflow of high-skill, high-income employees. New employees may look for housing in the BVHP neighborhood and could, in so doing, displace existing residents, or contribute to increased property values by driving up housing demand and therefore housing prices in the neighborhood. As noted in Section 3.6.3.3, educational attainment in the BVHP neighborhood is somewhat lower than in San Francisco as a whole or neighboring San Mateo County. This disparity in education levels could mean that new jobs, especially high-technology jobs, could go to people who reside outside the neighborhood and therefore eventually lead to displacement of existing residents.

Most of the new jobs associated with Alternative 1 would be in the R&D development, and there is no information at this time on the required education and skills for these jobs, since it is not known what firms will move into the newly developed area. However, the R&D development will generally contain office, light industrial, and laboratory uses, with a particular focus on attracting businesses working in "green" fields such as cleaner energy. These jobs will generally require a mix of skill and education levels, with some positions to be filled by highly educated and highly skilled workers (e.g., laboratory directors, who are likely to have at least a college degree in science) and others to be filled by workers with lower formal education or less specialized skills (e.g., office receptionists, certain workers in light industrial applications, and security or maintenance workers). Thus, it is unlikely that the increased employment opportunities that Alternative 1 would create would lead to displacement of current residents; indeed, many current residents may be able to take advantage of the new employment opportunities.

However, the Community Benefits Plan (Appendix O), an agreement between the developer and the city contains several provisions that would ameliorate potential increases in property values. In particular, the Community Housing Fund (Section 4.1 of the Community Benefits Plan) provides over $28,000,000 to be "used to assist qualifying residents in the purchase of Units in District 10 through opportunities such as down payment assistance, rent-to-own opportunities, purchase of buildable pads, and/or the purchase of Units, inside or outside of the Project, including those specifically designed for senior citizens."

In addition, the city and developer are negotiating a policy that would set a goal for 50 percent of all permanent workforce employment opportunities to be filled by San Francisco residents, with priority consideration first for residents of ZIP Code 94124, then second to other District 10 residents (i.e., residents of ZIP Codes 94134 and 94107). The detailed permanent workforce goals would be negotiated on an employer-by-employer basis to tailor and leverage employment opportunities depending on the business (Garcia 2010). (ZIP Code 94124 includes the BVHP neighborhood; 94134 lies immediately to the west of 94124 and roughly includes the neighborhoods of Portola and Visitacion Valley; and 94107 lies immediately to the north of 94124 and roughly includes Potrero and Central Waterfront.)

In view of the specific financial commitments of the Community Benefits Plan's Community Housing Fund, the local workforce goal, and the fact that jobs associated with Alternative 1 are available to workers with a wide range of education levels and skill sets, the impacts with respect to indirect displacement related to new employment opportunities would be *not significant*. No mitigation is proposed.

4.6.2.2.3 Factor 3: Displacement of Businesses

All displacement or renovation of existing employment centers (i.e., artists' studios) would occur during the construction phase, and there would be *no impact* in the operation phase. Therefore, no mitigation is proposed.

4.6.2.2.4 Factor 4: Consistency with General Plan Elements

Alternative 1 would provide for redevelopment of the HPS site in a way that is generally consistent with the relevant policies and objectives of the San Francisco General Plan, as listed in Section 3.6, Socioeconomics. In particular, relative to the Housing Element (San Francisco Planning Department 2004a), Alternative 1 is consistent with Policies 1.3, 1.7, 8.1, 8.4, and 8.9 because it would provide a mix of new housing types, including some units designed for renter occupancy and some designed for owner occupancy, and a mix of affordability ranges, all within a former industrial area. Under Alternative 1, HPS – along with the Candlestick Point development proposed in the related EIR – would provide 30 percent affordable units; therefore, this alternative is consistent with Policies 1.5, 4.1, 4.2, and 12.2. The alternative is consistent with Policies 11.1, 11.2, 11.3, 11.5, and 11.8 because it would enhance the redevelopment efforts of the BVHP neighborhood. Although this alternative would not meet the housing demand it generates as a stand-alone project, it would meet that demand when considered together with the related development of Candlestick Point, which would provide an additional 7,850 housing units; thus, when considered jointly, HPS is consistent with Policy 1.9.

In terms of the Commerce and Industry Element, Alternative 1 would encourage development that provides substantial net benefits in the form of employment, housing, and revitalization of neighborhoods; therefore, it is consistent with Policies 1.1 and 1.2. Because it would promote the attraction of new commercial and industrial firms, with a particular focus on emerging activities such as artist live/work studios and green technology, and the employment opportunities it would provide allow for a mix of skill and educational levels, it fulfills the intent of Policies 2.1, 3.1, 3.4, and 4.2. The city would also promote the hiring of local residents for project construction, which would be consistent with Policy 3.2. Because Alternative 1 would promote a mix of residential, commercial, and other uses that would contribute to neighborhood revitalization in BVHP, it is consistent with Policies 6.1, 6.3, 6.5, and 6.10.

Alternative 1 would increase available space for artists and arts organizations within an existing arts cluster. It is also the outgrowth of a planning process that has incorporated the active participation of artists and arts organizations for the redevelopment of a decommissioned military facility. Thus, it is compatible with all relevant policies in the Arts Element of the General Plan.

In summary, this alternative would have *no impact* relative to consistency with the relevant elements of the San Francisco General Plan. Note that although DoN's proposed disposal of the HPS site is not itself subject to local regulation, the subsequent redevelopment of the site would be subject to local authority.

4.6.3 Alternative 1A: Stadium Plan/No-Bridge Alternative

For most of the essential socioeconomic characteristics, Alternative 1A would be the same as Alternative 1. There would be the same numbers of jobs, housing, etc. The only difference is that the Yosemite Slough bridge would not be built, thereby eliminating the temporary jobs associated with its construction. Long term job generation would be the same for both Alternatives 1 and 1A.

4.6.3.1 Construction Impacts

4.6.3.1.1 Factor 1: Population and Housing Growth

There would be direct, but temporary, construction job growth at the project site as a result of Alternative 1A. Section 4.6.2.1.1 above identifies the average and maximum number of construction workers that would be employed during the construction period on a daily basis. There may be somewhat fewer workers during the period when the Yosemite Slough bridge would have been built, but otherwise the workforce would be the same.

Like Alternative 1, development of Alternative 1A would not generate a substantial, unplanned population increase, or a related demand for additional housing units. Therefore, impacts associated with construction employment would *not be significant*, and no mitigation is proposed.

4.6.3.1.2 Factor 2: Displacement of Housing and Population

There are no existing housing units at HPS. Therefore, build-out of Alternative 1A would not replace housing units with new uses, and no existing residents would be displaced. There would be *no impact* on displacement of housing and residents at this site. Therefore, no mitigation is proposed.

4.6.3.1.3 Factor 3: Displacement of Businesses

This alternative would not result in a net loss of employment for the about 100 studio artists working on the project site. However, depending on the difference in costs to rent existing studios versus costs to rent the new studios, the displacement and relocation could adversely affect the studio artist population. Taking the various elements of the Arts and Cultural Facilities component of the CBP into consideration (see Section 4.6.2.1.3 above), including, for example, development of an Artists Relocation Plan and measures to keep artists' rents affordable, implementation of the CBP would help to ensure that the impact of displacing existing artists' studios would *not be significant.* Therefore, no mitigation is proposed.

4.6.3.2 Operational Impacts

4.6.3.2.1 Factor 1: Population and Housing Growth

Direct

Direct population growth at HPS would be the same as Alternative 1. Employment growth at HPS under Alternative 1A would be the same as for Alternative 1. As shown in Table 4.6.2-1, Alternative 1 would result in 7,255 new jobs. Based on existing commuting patterns, 3,071 housing units would be required in San Francisco to meet anticipated housing demand. The 2,650 housing units that would be developed at HPS under Alternative 1A would be less than the total demand for new units generated by employment at HPS; however, units being constructed at other nearby projects (such as Candlestick Point) would offset HPS housing demand.

It is not anticipated that employment at HPS would create a substantial demand for housing in the BVHP neighborhood, San Francisco, or the region in excess of the housing provided as part of Alternative 1A or the housing otherwise available in the Bay Area. All impacts associated with direct population growth are considered *not significant* for HPS. Therefore, no mitigation is proposed.

Indirect

Infrastructure and services would be expanded to serve Alternative 1A, the same as for Alternative 1, without significant excess capacity that might encourage additional local growth beyond that already planned for under Proposition G and under the redevelopment plans. The development of this alternative would not expand infrastructure to geographic areas that were not previously served, nor would it create new transportation access to a previously inaccessible area. All impacts associated with indirect population growth are considered *not significant* for HPS. Therefore, no mitigation is proposed.

4.6.3.2.2 Factor 2: Displacement of Housing and Population

There would be no direct impacts related to displacement of existing structures under Alternative 1A. The HPS site does not contain housing units presently, so no direct displacement of housing units would occur in either the construction or operation phase.

However, there is a potential for Alternative 1A to have indirect impacts related to displacement of existing residents. The overall redevelopment plan at HPS Phases I and II has the potential to lead to a general increase in rent levels, or in neighborhood property values for homeowners (and therefore property taxes which existing residents – especially those on low or fixed incomes – may be unable to pay). The alternative involves construction of 2,650 housing units, including 457 affordable units. Table 4.6.3-1 provides a summary of the proposed affordable and below market rate units for Alternative 1A. As indicated in the table, 17 percent of the units would be affordable and 21 percent would be below market rate. These figures exceed the requirements for SFRA affordable housing within Redevelopment Project Areas, which state that at least 15 percent (398) of all new units within the redevelopment areas must be affordable.

Table 4.6.3.1. Proposed Affordable Housing Mix for Alternative 1A

Description	Units
Total Housing Units Proposed	2,650
15% of Total Units (SFRA affordable housing requirement)	398
Proposed Agency Affordable Units	221
Proposed Inclusionary Units	236
SFRA Affordable Subtotal	457
Proposed SFRA Affordable Units (percent of total units)	17%
Workforce Units	102
Total Below Market Units	559
Proposed Below Market (percent of total units)	21%

Source: SFRA 2010.

As for Alternative 1, most of the new jobs associated with Alternative 1A would be in the R&D development. However, it is unlikely that the increased employment opportunities that Alternative 1A would create would lead to displacement of current residents; instead, many current residents may be able to take advantage of the new employment opportunities.

The Community Benefits Plan agreement between the developer and the city (Appendix O) would ameliorate potential increases in property values via the Community Housing Fund (Section 4.1 of the Community Benefits Plan). In addition, the city and developer are negotiating a policy that would set a goal for 50 percent of all permanent workforce employment opportunities to be filled by San Francisco residents, with priority consideration first for residents of ZIP Code 94124, then second to other District 10 residents (i.e., residents of ZIP Codes 94134 and 94107).

In view of the specific financial commitments of the Community Benefits Plan's Community Housing Fund, the local workforce goal, and the fact that jobs associated with Alternative 1A are available to workers with a wide range of education levels and skill sets, the impacts with respect to indirect displacement related to new employment opportunities would *not be significant*. Therefore, no mitigation is proposed.

4.6.3.2.3 Factor 3: Displacement of Businesses

All displacement or renovation of existing employment centers (i.e., artists' studios) would occur during the construction phase, and there would be *no impact* in the operation phase. Therefore, no mitigation is proposed.

4.6.3.2.4 Factor 4: Consistency with General Plan Elements

Alternative 1A would provide for redevelopment of the HPS site in a way that is generally consistent with the relevant policies and objectives of the San Francisco General Plan, as listed in Section 3.6, Socioeconomics. In particular, relative to the Housing Element, Alternative 1A is consistent with Policies 1.3, 1.7, 8.1, 8.4, and 8.9 because it would provide a mix of new housing types, including some units designed for renter occupancy and some designed for owner occupancy, and a mix of affordability ranges, all within a former industrial area. Under Alternative 1A, HPS – along with the Candlestick Point development proposed in the related EIR – would provide 30 percent affordable units; therefore, this alternative is consistent with Policies 1.5, 4.1, 4.2, and 12.2. The alternative is consistent with Policies

11.1, 11.2, 11.3, 11.5, and 11.8 because it would enhance the redevelopment efforts of the BVHP neighborhood. Although this alternative would not meet the housing demand it generates as a stand-alone project, it would meet that demand when considered together with the related development of Candlestick Point, which would provide an additional 7,850 housing units; thus, when considered jointly, HPS is consistent with Policy 1.9. In summary, this alternative would have *no impact* relative to consistency with the relevant elements of the San Francisco General Plan.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial differences. Therefore, socioeconomic impacts would not be different for this factor.

4.6.4 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

4.6.4.1 Construction Impacts

4.6.4.1.1 Factor 1: Population and Housing Growth

As in Alternative 1, there would be direct, temporary construction job growth at the project site as a result of Alternative 2. The number of construction workers may differ slightly from those presented in Section 4.6.2.1.1 above, but the average and maximum number of construction workers that would be employed during the construction period on a daily basis would not exceed those numbers. Thus, there would be at most an average of 275 and a maximum of 342 workers onsite in the peak year. As in Alternative 1, peak construction employment would occur in the same year.

Construction hiring policies associated with the proposed project would aim to maximize hiring among local residents. It is likely that construction employees not already living in the BVHP neighborhood would commute from elsewhere in the Bay Area rather than relocate to the BVHP neighborhood for a temporary construction assignment. Thus, development of the proposed project would not generate a substantial, unplanned population increase or a related demand for additional housing units. Therefore, impacts associated with construction employment would *not be significant,* and no mitigation is proposed.

4.6.4.1.2 Factor 2: Displacement of Housing and Population

There are no existing housing units at HPS. Therefore, build-out of Alternative 2 would not replace housing units with new uses, and no existing residents would be displaced. Because there would be no residential displacement at HPS, development of Alternative 2 would have *no impact* on displacement of housing and residents at this site. Therefore, no mitigation is proposed.

4.6.4.1.3 Factor 3: Displacement of Businesses

As discussed in Section 3.6.3.3, Employment and Income, existing employment in the project site consists of about 100 studio artists, as well as a small number of contract and temporary jobs (about 16 full-time equivalent jobs) associated with security, maintenance, and environmental cleanup. Alternative 2 would include the demolition of some existing artists' studios and renovation of others, as well as the construction of new buildings to be used as artists' studios. Space dedicated to artists' studios and an art center would increase from the current 85,121 ft^2 (7,916 m^2) to 255,000 ft^2 (23,700 m^2). Thus, this alternative would not result in a net loss of employment for the about 100 studio artists presently working on the project site. However, depending on the difference in costs to rent existing artists' studios versus costs to rent the new studios, the displacement and relocation could adversely affect the studio artist population. Taking the various elements of the Arts and Cultural Facilities component of the Community Benefits Plan into consideration (see Section 4.6.2.1.3 above), including, for example, development of an

Artists Relocation Plan and measures to keep artists' rents affordable, implementation of the Community Benefits Plan would help to ensure that impact of displacing existing artists' studios would *not be significant*. Therefore, no mitigation is proposed.

Construction activities would result in some temporary disruptions to traffic flows, both within the HPS development area and on nearby roadways that provide access to the redevelopment area. Additional traffic from construction vehicles and workers would adversely affect roadway capacity and could lead to delays due to traffic diversions and the increase in truck traffic. This could lead to minor impacts on access to businesses in the area, which could result in minor impacts on their viability. However, because of the peninsular geography of the HPS site and the fact that a limited number of businesses are located on or immediately adjacent to the site, it is expected that the impact of access disruptions on the economic viability of businesses in the analysis area would *not be significant*. Therefore, no mitigation is proposed. Section 4.1, Transportation, Traffic, and Circulation provides additional information about transportation conditions, impacts, and proposed mitigation measures.

4.6.4.2 Operational Impacts

4.6.4.2.1 Factor 1: Population and Housing Growth

Direct

Direct population growth at HPS would include the residents and employees who would occupy the new homes and businesses developed at this site. Like Alternative 1, Alternative 2 would involve the construction of 2,650 housing units at HPS. At full build-out in 2030, the population at HPS would be 6,175 residents, based on a factor of 2.33 persons per household (see Section 3.6.3.1.2, BVHP Neighborhood and Project Site). Alternative 2 would also include development of new retail, R&D, and other uses, resulting in an estimated 13,159 new jobs (see Table 4.6.4-1). In total, the population at HPS would represent 0.7 percent of the estimated citywide population of 916,800 in 2030, while employment would represent 1.8 percent of the 748,100 jobs in 2030 in San Francisco.

Table 4.6.4-1. Operation Phase Project Employment in Alternative 2

Land Use	*Employment Factor*[1]	*Development Program in Alternative 2*	*Employment in Alternative 2 (jobs)*
Residential	25 units/job	2,650 units	106
Neighborhood Retail	270 gft^2/job	125,000 gft^2	463
Research and Development	400 gft^2/job	5,000,000 gft^2	12,500
Football Stadium	2,915 jobs/event	0 events/year	0
Public Parking (Commercial and General)	270 spaces/job[2]	8,706 spaces	32
Parks and Open Space	0.26 jobs/ac[2]	222.2 ac	58
Total			**13,159**

Sources:
1. San Francisco Planning Department 2002.
2. Economic and Planning Systems, Inc. 2009.

Although Alternative 2 would result in an increase in population and employment at HPS, growth in this area has long been the subject of many planning activities. A primary objective of this alternative is to provide new housing and non-residential uses in support of planned redevelopment. Alternative 2 is broadly consistent with the Bayview Jobs, Parks and Housing Initiative (Proposition G, approved by voters in 2008), although it excludes the development of a new football stadium (see Chapter 1 for a summary of the objectives of Proposition G). Other than the omission of the stadium, the uses provided as part of Alternative 2 support planned growth at the project site.

As a result of these ongoing planning activities, service providers in the City of San Francisco have been aware of the likely redevelopment, and have included future growth projections for HPS in their long-term operations plans. Alternative 2 would provide onsite infrastructure for connections to city mains, and would include onsite treatment of stormwater runoff (see Section 3.10, Utilities and Section 3.11, Public Services for further description of the potential impacts of this alternative on infrastructure and services). In summary, the infrastructure needed to support the level of growth anticipated under Alternative 2 was planned based on population projections that included all of the housing, and about half of the employment, associated with the HPS redevelopment.

Employment growth at HPS would be considered substantial if it resulted in housing demand that would exceed planned regional housing development. As shown in Table 4.6.4-2, Alternative 2 would result in 13,159 new jobs. Based on the Planning Department's projection of the number of workers in the average city household in 2025, the average household would be expected to have 1.36 workers (San Francisco Planning Department 2004a, Table I-14). (Note that no forecast data are available for 2030.) This implies that each new job results in a need for 0.74 housing units. Consistent with existing commuting patterns described in Section 3.6.3.3, Employment and Income, it is assumed that 55 percent of the workers would seek housing in the City of San Francisco (USDOT 2006). The calculations also assume a vacancy rate of 4.7 percent (California Department of Finance 2009). Based on these assumptions, the development at HPS would result in a total demand for 10,130 housing units as a result of employment at HPS, including 5,572 units within San Francisco and 4,559 units outside the city.

Because one of the objectives of this alternative is to provide employment opportunities for existing residents in the BVHP neighborhood, it is anticipated that some of the future employees at HPS would include residents already living in the neighborhood. Although total housing demand could include existing households, this analysis conservatively assumes that all housing demand generated by Alternative 2 would need to be accommodated by new units.

Total demand for housing at HPS would represent 4.7 percent of the total Bay Area housing need of 214,500 units (based on the RHNA targets; refer to Section 3.6.3.2.3, Regional Housing Needs Plan) projected by ABAG through 2014. While much of the population increase associated with employment at HPS could be accommodated at the project site, it is likely that some employees would elect to live elsewhere in the city or within surrounding Bay Area communities.

Table 4.6.4-2. Alternative 2 Housing Demand

Item	*Estimate*	*Notes*
New employment	13,159 jobs	See Table 4.6.4-1.
Housing demand	10,130 units	Calculated as project employment divided by 1.36[1] workers per housing unit, and plus additional 4.7[2] percent housing units to account for vacancy rate.
Housing demand in San Francisco	5,572 units	Calculated as housing demand times 55 percent, representing the fraction of workers assumed to seek housing in San Francisco.[3]
Housing demand in other communities	4,559 units	Calculated as housing demand times 45 percent, representing the fraction of workers assumed to seek housing outside San Francisco.[3]

Sources:
1. San Francisco Planning Department 2004a, Table I-14.
2. California Department of Finance 2009.
3. USDOT 2006.

Based on existing commuting patterns, 5,572 housing units would be required in San Francisco to meet anticipated housing demand. The 2,650 housing units that would be developed at HPS would be less than the total demand for new units generated by employment at HPS; however, units being constructed at other nearby projects (such as Candlestick Point) would offset HPS housing demand. The analysis of cumulative project impacts in Chapter 5 discusses the neighboring projects and cumulative impacts in more detail. A broad range of housing options of varying sizes, types, and levels of affordability would be developed at HPS Phase I (which is addressed in the 2000 FEIS and is presently under development), HPS (the subject of the present SEIS), and at Candlestick Point, which is the subject of an EIR prepared by the City and County of San Francisco. Because the new housing would be close to the jobs provided by Alternative 2, future employees at HPS may be more likely to seek housing at nearby developments (i.e., in proximity to the project site) prior to searching for housing in the surrounding BVHP neighborhood. In addition, the housing provided at HPS would be available to existing residents of the BVHP neighborhood should neighborhood residents wish to relocate to the project site.

A percentage of the persons employed at HPS would also likely choose to live in other areas in the City of San Francisco, or other cities in the Bay Area, for various personal and socioeconomic reasons. Based on existing commuting patterns, the demand for about 4,559 units would be generated in surrounding Bay Area communities by HPS development. This housing demand would be dispersed throughout the nine-county Bay Area, which would result in negligible potential increases in housing demand within the Bay Area.

It is not anticipated that employment at HPS would create a substantial demand for housing in the BVHP neighborhood, San Francisco, or the region in excess of the housing provided as part of Alternative 2 or the housing otherwise available in the Bay Area. To summarize, the need for infrastructure, public services, and housing associated with direct population growth proposed at HPS has been anticipated in ongoing local and regional planning activities. Therefore, all impacts associated with direct population growth would *not be significant* for HPS, and no mitigation is proposed.

Indirect

Infrastructure and services would be expanded to serve HPS, without significant excess capacity that might encourage additional local growth beyond that already planned for under Proposition G and under the redevelopment plans. The development at HPS would not expand infrastructure to geographic areas that were not previously served, nor would it create new transportation access to a previously inaccessible area. Therefore, all impacts associated with indirect population growth would *not be significant* for HPS, and no mitigation is proposed.

4.6.4.2.2 Factor 2: Displacement of Housing and Population

The HPS site does not contain housing units, so no direct displacement of existing housing units would occur in either the construction or operation phase. However, as for Alternative 1, there is a potential for Alternative 2 to have indirect impacts related to displacement of existing residents. The alternative involves construction of 2,650 housing units, including 457 affordable units. Table 4.6.4-3 provides a summary of the proposed affordable and below market rate units for Alternative 2. As indicated in the table, 17 percent of the units would be affordable and 21 percent would be below market rate. These figures exceed the requirements for SFRA affordable housing within Redevelopment Project Areas, which state that at least 15 percent (398) of all new units within the redevelopment areas must be affordable.

Alternative 2 has the potential to lead to displacement of existing residents if the employment opportunities associated with the project would lead to a disproportionate inflow of high-skill, high-income employees. As noted in Section 3.6.3.3, Employment and Income, educational attainment in the BVHP neighborhood is somewhat lower than in San Francisco as a whole or neighboring San Mateo County. This disparity in education levels could mean that new jobs, especially high-technology jobs, could go to people who reside outside the neighborhood and therefore eventually lead to displacement of existing residents.

Table 4.6.4-3. Proposed Affordable Housing Mix for Alternative 2

Description	Units
Total Housing Units Proposed	2,650
15% of Total Units (SFRA affordable housing requirement)	398
Proposed Agency Affordable Units	221
Proposed Inclusionary Units	236
SFRA Affordable Subtotal	457
Proposed SFRA Affordable Units (percent of total units)	17%
Workforce Units	102
Total Below Market Units	559
Proposed Below Market (percent of total units)	21%
Source: SFRA 2010.	

The majority of the new jobs associated with Alternative 2 would be in the R&D development, and there is no information at this time on the required education and skills for these jobs, since it is not known what firms will move into the newly developed area. Thus, it is unlikely that the increased employment opportunities that Alternative 2 would create would lead to displacement of current residents; instead, many current residents may be able to take advantage of the new employment opportunities.

The Community Benefits Plan agreement between the developer and the city (Appendix O) would ameliorate potential increases in property values via the Community Housing Fund (Section 4.1 of the Community Benefits Plan). In addition, the city and developer are negotiating a policy that would set a goal for 50 percent of all permanent workforce employment opportunities to be filled by San Francisco residents, with priority consideration first for residents of ZIP Code 94124, then second to other District 10 residents (i.e., residents of ZIP Codes 94134 and 94107).

In view of the specific financial commitments of the Community Benefits Plan's Community Housing Fund, the local workforce goal, and the fact that jobs associated with this alternative are available to workers with a wide range of education levels and skill sets, the impacts with respect to indirect displacement related to new employment opportunities would *not be significant* and no mitigation is proposed.

4.6.4.2.3 Factor 3: Displacement of Businesses

All displacement or renovation of existing employment centers (i.e., artists' studios) would occur during the construction phase, and there would be *no impact* in the operation phase. Therefore, no mitigation is proposed.

4.6.4.2.4 Factor 4: Consistency with General Plan Elements

Alternative 2, like Alternative 1, would provide for redevelopment of the HPS site in a way that is generally consistent with the relevant policies and objectives of the San Francisco General Plan, as listed in Section 3.6, Socioeconomics. In particular, relative to the Housing Element, Alternative 2 is consistent with Policies 1.3, 1.7, 8.1, 8.4, and 8.9 because it would provide a mix of new housing types, including some units designed for renter occupancy and some designed for owner occupancy, and a mix of affordability ranges, all within a former industrial area. Under Alternative 2, HPS – along with the Candlestick Point development proposed in the related EIR – would provide a mix of market-rate and affordable units; therefore, this alternative is consistent with Policies 1.5, 4.1, 4.2, and 12.2. The alternative is consistent with

Policies 11.1, 11.2, 11.3, 11.5, and 11.8 because it would enhance the redevelopment efforts of the BVHP neighborhood. Although this alternative would not meet the housing demand it would generate as a stand-alone project, it would meet that demand when considered together with the related development of Candlestick Point, which would provide an additional 7,850 housing units; thus, when considered jointly, this alternative is consistent with Policy 1.9.

In terms of the Commerce and Industry Element, Alternative 2 would encourage development that provides substantial net benefits in the form of employment, housing, and revitalization of neighborhoods; therefore, it is consistent with Policies 1.1 and 1.2. Because it would promote the attraction of new commercial and industrial firms, with a particular focus on emerging activities such as artistry and crafts and green technology, and the employment opportunities it would provide allow for a mix of skill and educational levels, it fulfills the intent of Policies 2.1, 3.1, 3.4, and 4.2. The city would also promote the hiring of local residents for project construction, which would be consistent with Policy 3.2. Because Alternative 2 would promote a mix of residential, commercial, and other uses that would contribute to neighborhood revitalization in BVHP, it is consistent with Policies 6.1, 6.3, 6.5, and 6.10.

Alternative 2 would increase available space for artists and arts organizations within an existing arts cluster. It is also the outgrowth of a planning process that has incorporated the active participation of artists and arts organizations for the redevelopment of a decommissioned military facility. Thus, it is compatible with all relevant policies in the Arts Element of the General Plan.

In summary, this alternative would have *no impact* relative to consistency with the relevant elements of the San Francisco General Plan.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial differences. Therefore, socioeconomic impacts would not be different for this factor.

4.6.5 Alternative 2A: Non-Stadium/Housing and R&D Alternative

4.6.5.1 Construction Impacts

4.6.5.1.1 Factor 1: Population and Housing Growth

As in Alternative 1, there would be direct, temporary construction job growth at the project site as a result of Alternative 2A. The number of construction workers would differ slightly from what is presented in Section 4.6.2.1.1 above, but the average and maximum number of construction workers that would be employed during the construction period on a daily basis would not exceed those numbers. Thus, there would be at most an average of 275 and a maximum of 342 workers onsite in the peak year. As in Alternative 1, peak construction employment would occur in the same year.

Construction hiring policies associated with Alternative 2A would aim to maximize hiring among local residents. It is likely that construction employees not already living in the BVHP neighborhood would commute from elsewhere in the Bay Area rather than relocate to the BVHP neighborhood for a temporary construction assignment. Thus, development of Alternative 2A would not generate a substantial, unplanned population increase, or a related demand for additional housing units. Therefore, impacts associated with construction employment would *not be significant*, and no mitigation is proposed.

4.6.5.1.2 Factor 2: Displacement of Housing and Population

There are no existing housing units at HPS. Therefore, build-out of Alternative 2A would not replace housing units with new uses, and no existing residents would be displaced. Because there would be no residential displacement at HPS, development of Alternative 2A would have *no impact* on displacement of housing and residents at this site. Therefore, no mitigation is proposed.

4.6.5.1.3 Factor 3: Displacement of Businesses

As discussed in Section 3.6.3.3, existing employment in the project site consists of about 100 studio artists, as well as a small number of contract and temporary jobs (about 16 full-time equivalent jobs) associated with security, maintenance, and environmental cleanup. Alternative 2A would include the demolition of some existing artists' studios and renovation of others, as well as the construction of new buildings to be used as artists' studios. Space dedicated to artists' studios and an art center would increase from the current 85,121 ft^2 (7,916 m^2) to 255,000 ft^2 (23,700 m^2). Thus, this alternative would not result in a net loss of employment for the about 100 studio artists presently working on the project site. However, depending on the timing between displacement of the artists from existing studios and construction of new studios, and depending on the difference in costs to rent existing studios versus costs to rent the new studios, the displacement and relocation would affect the studio artist population. However, an Artists Relocation Plan agreement between the City and County of San Francisco and the developer to ensure that existing artists already occupying space at HPS will be able to move to another studio on the shipyard site at reasonable cost is designed to alleviate this impact. Therefore, the impact of displacing artists' studios would *not be significant*, and no mitigation is proposed.

Construction activities would result in some temporary disruptions to traffic flows, both within the HPS development area and on nearby roadways that provide access to the redevelopment area. Additional traffic from construction vehicles and workers would adversely affect roadway capacity and could lead to delays due to traffic diversions and the increase in truck traffic. This could lead to minor impacts on access to businesses in the area, which could result in minor impacts on their viability. However, because of the peninsular geography of the HPS site and the fact that a limited number of businesses are located on or immediately adjacent to the site, it is expected that the impact of access disruptions on the economic viability of businesses in the analysis area would *not be significant*. Section 4.1, Transportation, Traffic, and Circulation provides additional information about transportation conditions, impacts, and proposed mitigation measures.

4.6.5.2 Operational Impacts

4.6.5.2.1 Factor 1: Population and Housing Growth

Direct

Direct population growth at HPS would include the residents and employees who would occupy the new homes and businesses developed at this site. Alternative 2A would involve the construction of 4,275 housing units at HPS. At full build-out in 2030, the population at HPS would be 9,961 residents, based on a factor of 2.33 persons per household (see Section 3.6.3.1.2, BVHP Neighborhood and Project Site). Alternative 2A would also include development of new retail, R&D, and other uses, resulting in an estimated 8,214 new jobs (Table 4.6.5-1). In total, the population at HPS would represent 1.0 percent of the estimated citywide population of 916,800 in 2030, while employment would represent 0.9 percent of the 748,100 jobs in 2030 in San Francisco.

Although Alternative 2A would result in an increase in population and employment at HPS, growth in this area has long been the subject of many planning activities. The primary objective of this alternative is to provide new housing and non-residential uses in support of planned redevelopment. Alternative 2A is broadly consistent with the Bayview Jobs, Parks and Housing Initiative (Proposition G, approved by voters in 2008), although it excludes the development of a new football stadium (see Chapter 1 for a summary of the objectives of Proposition G). Other than the omission of the stadium, the uses provided as part of Alternative 2A support planned growth at the project site.

Table 4.6.5-1. Operation Phase Project Employment in Alternative 2A			
Land Use	*Employment Factor*[1]	*Development Program in Alternative 2A*	*Employment in Alternative 2A (jobs)*
Residential	25 units/job	4,275 units	171
Neighborhood Retail	270 gft^2/job	125,000 gft^2	463
Research and Development	400 gft^2/job	3,000,000 gft^2	7,500
Football Stadium	2,915 jobs/event	0 events/year	0
Public Parking (Commercial and General)	270 spaces/job[2]	5,856 spaces	22
Parks and Open Space	0.26 jobs/ac[2]	221.8 ac	58
Total			**8,214**

Sources:
1. San Francisco Planning Department 2002, except as noted.
2. Economic & Planning Systems 2009.

As a result of these ongoing planning activities, service providers in the City of San Francisco have been aware of the likely redevelopment, and have included future growth projections for HPS in their long-term operations plans. Alternative 2A would provide all onsite infrastructure for connections to city mains, and would include onsite treatment of stormwater runoff (see Section 3.10, Utilities and Section 3.11, Public Services for further description of the potential impacts of this alternative on infrastructure and services). In summary, the infrastructure needed to support the level of growth anticipated under Alternative 2A was planned based on population projections that included most of the housing, and all of the employment, associated with the HPS redevelopment.

Employment growth at HPS would be considered substantial if it resulted in housing demand that would exceed planned regional housing development. As shown in Table 4.6.5-2, Alternative 2A would result in 8,214 new jobs. Based on the Planning Department's projection of the number of workers in the average San Francisco household in 2025, the average household would be expected to have 1.36 workers (San Francisco Planning Department 2004a, Table I-14). (Note that no forecast data are available for 2030.) This implies that each new job results in a need for 0.74 housing units. Consistent with existing commuting patterns described in Section 3.6.3.3, it is assumed that 55 percent of the workers would seek housing in the City of San Francisco (USDOT 2006). The calculations also assume a vacancy rate of 4.7 percent (California Department of Finance 2009). Based on these assumptions, the development at HPS would result in a total demand for 6,324 housing units as a result of employment at HPS, including 3,478 units within San Francisco and 2,846 units outside the city.

Table 4.6.5-2. Alternative 2A Housing Demand		
Item	*Estimate*	*Notes*
New employment	8,214 jobs	See Table 4.6.5-1.
Housing demand	6,324 units	Calculated as project employment divided by 1.36[1] workers per housing unit, and plus additional 4.7[2] percent housing units to account for vacancy rate.
Housing demand in San Francisco[3]	3,478 units	Calculated as housing demand times 55 percent, representing the fraction of workers assumed to seek housing in San Francisco.
Housing demand in other communities[3]	2,846 units	Calculated as housing demand times 45 percent, representing the fraction of workers assumed to seek housing outside San Francisco.

Sources:
1. San Francisco Planning Department 2004a, Table I-14.
2. California Department of Finance 2009.
3. USDOT 2006.

It should be noted that one of the objectives of this alternative is to provide employment opportunities for existing residents in the BVHP neighborhood. Thus, it is anticipated that some of the future employees at HPS would include residents already living in the neighborhood. Although total housing demand could include existing households, this analysis conservatively assumes that all housing demand generated by Alternative 2A would need to be accommodated by new units.

Total demand for housing at HPS would represent 2.9 percent of the total Bay Area housing need of 214,500 units (based on the RHNA targets; refer to Section 3.6.3.2.3, Regional Housing Plan Needs) projected by ABAG through 2014. While much of the population increase associated with employment at HPS could be accommodated at the project site, it is likely that some employees would elect to live elsewhere in the city or within surrounding Bay Area communities.

Based on existing commuting patterns, 3,478 housing units would be required in San Francisco to meet anticipated housing demand. The 4,275 housing units that would be developed at HPS would exceed the total demand for new units generated by employment at HPS; thus, this alternative would provide all necessary housing units to compensate for its increased housing demand, and would not contribute to excess housing demand in San Francisco. The alternative would also include a broad range of housing options of varying sizes, types, and levels of affordability. Because the new housing would be in close proximity to the jobs provided by Alternative 2A, future employees at HPS may be more likely to seek housing at nearby developments (i.e., in close proximity to the project site) prior to searching for housing in the surrounding BVHP neighborhood. In addition, the housing provided at HPS would be available to existing residents of the BVHP neighborhood should neighborhood residents wish to relocate to the project site.

A percentage of the persons employed at HPS would also likely choose to live in other areas in the City of San Francisco, or other cities in the Bay Area, for various personal and socioeconomic reasons. Based on existing commuting patterns, the demand for about 2,846 units would be generated in surrounding Bay Area communities by HPS development. This housing demand would be dispersed throughout the nine-county Bay Area, which would result in negligible potential increases in housing demand within the Bay Area.

It is not anticipated that employment at HPS would create a substantial demand for housing in the BVHP neighborhood, San Francisco, or the region in excess of the housing provided as part of Alternative 2A or the housing otherwise available in the Bay Area. To summarize, the need for infrastructure, public services, and housing associated with direct population growth proposed at HPS has been anticipated in ongoing local and regional planning activities. Therefore, all impacts associated with direct population growth would *not be significant* for HPS, and no mitigation is proposed.

Indirect

Infrastructure and services would be expanded to serve HPS, without excess capacity that might encourage additional local growth beyond that already planned for under Proposition G and under the redevelopment plans. The development at HPS would not expand infrastructure to geographic areas that were not previously served, nor would it create new transportation access to a previously inaccessible area. Therefore, all impacts associated with indirect population growth would *not be significant* for HPS, and no mitigation is proposed.

4.6.5.2.2 Factor 2: Displacement of Housing and Population

There would be no direct impacts related to displacements of existing structures. The HPS site does not contain housing units presently, so no direct displacement of housing units would occur in either the construction or operation phase.

However, there is a potential for Alternative 2A to have indirect impacts related to displacement of existing residents. The alternative involves construction of 4,275 housing units. Table 4.6.5-3 provides a summary of the proposed affordable and below market rate units for Alternative 2A. As indicated in the table, 17 percent of the units would be affordable and 21 percent would be below market rate. These figures exceed the requirements for SFRA affordable housing within Redevelopment Project Areas, which state that at least 15 percent (642) of all new units within the redevelopment areas must be affordable.

Table 4.6.5-3. Proposed Affordable Housing Mix for Alternative 2A

Description	*Units*
Total Housing Units Proposed	4,275
15% of Total Units (SFRA affordable housing requirement)	642
Proposed Agency Affordable Units	351
Proposed Inclusionary Units	381
SFRA Affordable Subtotal	732
Proposed SFRA Affordable Units (percent of total units)	17%
Workforce Units	182
Total Below Market Units	914
Proposed Below Market (percent of total units)	21%

Source: SFRA 2010.

Alternative 2A has the potential to lead to displacement of existing residents if the employment opportunities associated with the project would lead to a disproportionate inflow of high-skill, high-income employees. As noted in Section 3.6.3.3, Employment and Income, educational attainment in the BVHP neighborhood is somewhat lower than in San Francisco as a whole or neighboring San Mateo County. This disparity in education levels could mean that new jobs, especially high-technology jobs, could go to people who reside outside the neighborhood and therefore eventually lead to displacement of existing residents.

The majority of the new jobs associated with Alternative 2A would be in the R&D development, and there is no information at this time on the required education and skills for these jobs, since it is not known what firms will move into the newly developed area. Thus, it is unlikely that the increased employment opportunities that Alternative 2A would create would lead to displacement of current residents; instead, many current residents may be able to take advantage of the new employment opportunities.

The Community Benefits Plan agreement between the developer and the city (Appendix O) would ameliorate potential increases in property values via the Community Housing Fund (Section 4.1 of the Community Benefits Plan). In addition, the city and developer are negotiating a policy that would set a goal for 50 percent of all permanent workforce employment opportunities to be filled by San Francisco residents, with priority consideration first for residents of ZIP Code 94124, then second to other District 10 residents (i.e., residents of ZIP Codes 94134 and 94107).

In view of the specific financial commitments of the Community Benefits Plan's Community Housing Fund, the local workforce goal, and the fact that jobs associated with this alternative are available to workers with a wide range of education levels and skill sets, the impacts with respect to indirect displacement related to new employment opportunities would *not be significant*, and no mitigation is proposed.

4.6.5.2.3 Factor 3: Displacement of Businesses

All displacement or renovation of existing employment centers (i.e., artists' studios) would occur during the construction phase, and there would be *no impact* in the operation phase. Therefore, no mitigation is proposed.

4.6.5.2.4 Factor 4: Consistency with General Plan Elements

Alternative 2A would provide for redevelopment of the HPS site in a way that is generally consistent with the relevant policies and objectives of the San Francisco General Plan, as listed in Section 3.6, Socioeconomics. In particular, relative to the Housing Element, Alternative 2A is consistent with Policies 1.3, 1.7, 8.1, 8.4, and 8.9 because it would provide a mix of new housing types, including some units designed for renter occupancy and some designed for owner occupancy, and a mix of affordability ranges, all within a former industrial area. Under Alternative 2A, HPS – along with the Candlestick Point development proposed in the related EIR – would provide a mix of market-rate and affordable units; therefore, this alternative is consistent with Policies 1.5, 4.1, 4.2, and 12.2. The alternative is consistent with Policies 11.1, 11.2, 11.3, 11.5, and 11.8 because it would enhance the redevelopment efforts of the BVHP neighborhood. This alternative would meet the housing demand it generates, even without consideration of the related nearby developments. Thus, it is consistent with Policy 1.9.

In terms of the Commerce and Industry Element, Alternative 2A would encourage development that provides substantial net benefits in the form of employment, housing, and revitalization of neighborhoods; therefore, it is consistent with Policies 1.1 and 1.2. Because it would promote the attraction of new commercial and industrial firms, with a particular focus on emerging activities such as artistry and crafts and green technology, and the employment opportunities it would provide allow for a mix of skill and educational levels, it fulfills the intent of Policies 2.1, 3.1, 3.4, and 4.2. The city would also promote the hiring of local residents for project construction, which would be consistent with Policy 3.2. Because Alternative 2A would promote a mix of residential, commercial, and other uses that would contribute to neighborhood revitalization in BVHP, it is consistent with Policies 6.1, 6.3, 6.5, and 6.10.

Alternative 2A would increase available space for artists and arts organizations within an existing arts cluster. It is also the outgrowth of a planning process that has incorporated the active participation of artists and arts organizations for the redevelopment of a decommissioned military facility. Thus, it is compatible with all relevant policies in the Arts Element of the General Plan.

In summary, this alternative would have *no impact* relative to consistency with the relevant elements of the San Francisco General Plan.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial differences. Therefore, socioeconomic impacts would not be different for this factor.

4.6.6 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

4.6.6.1 Construction Impacts

4.6.6.1.1 Factor 1: Population and Housing Growth

As in Alternative 1, there would be direct, temporary construction job growth at the project site as a result of Alternative 3. The number of construction workers would differ slightly from what is presented in Table 4.6.2-1, but the average and maximum number of construction workers that would be employed during the construction period on a daily basis would not exceed those shown in that table. Thus, there would be at most an average of 275 and a maximum of 342 workers onsite in the peak year. As in Alternative 1, peak construction employment is expected to occur in 2015.

Construction hiring policies associated with Alternative 3 would aim to maximize hiring among local residents. It is likely that construction employees not already living in the BVHP neighborhood would commute from elsewhere in the Bay Area rather than relocate to the BVHP neighborhood for a temporary construction assignment. Thus, development of Alternative 3 would not generate a substantial, unplanned population increase, or a related demand for additional housing units. Therefore, impacts associated with construction employment would *not be significant*, and no mitigation is proposed.

4.6.6.1.2 Factor 2: Displacement of Housing and Population

There are no existing housing units at HPS. Therefore, build-out of Alternative 3 would not replace housing units with new uses, and no existing residents would be displaced. Because there would be no residential displacement at HPS, development of Alternative 3 would have *no impact* on displacement of housing and residents at this site, and no mitigation is proposed.

4.6.6.1.3 Factor 3: Displacement of Businesses

Existing employment in the project site consists of about 100 studio artists, as well as a small number of contract and temporary jobs (about 16 full-time equivalent jobs) associated with security, maintenance, and environmental cleanup. Alternative 3 would demolish some existing artists' studios and renovate others, as well as construct new buildings to be used as artists' studios. Space dedicated to artists' studios and an art center would increase from the current 85,121 ft^2 (7,916 m^2) to 255,000 ft^2 (23,700 m^2). Thus, this alternative would not result in a net loss of employment for the about 100 studio artists presently working on the project site. However, depending on the timing between displacement of the artists from existing studios and construction of new studios, and depending on the difference in costs to rent existing studios versus costs to rent the new studios, the displacement and relocation could have an adverse effect on the studio artist population. However, depending on the difference in costs to rent existing artists' studios versus costs to rent the new studios, the displacement and relocation could adversely affect the studio artist population. Taking the various elements of the Arts and Cultural Facilities component of the Community Benefits Plan into consideration (see Section 4.6.2.1.3 above) including, for example, development of an Artists Relocation Plan and measures to keep artists' rents affordable, implementation of the Community Benefits Plan would help to ensure that displacement of existing artists' studios would not cause a significant socioeconomic impact. Construction activities would result in some temporary disruptions to traffic flows, both within the HPS development area and on nearby roadways that provide access to the redevelopment area. This could lead to minor impacts on access to businesses in the area, which could result in minor impacts on their viability. However, because of the peninsular geography of the HPS site and the fact that a limited number of businesses are located on or immediately adjacent to the site, it is expected that impacts to access disruptions on the economic viability of businesses in the analysis area would *not be significant*.

4.6.6.2 Operational Impacts

4.6.6.2.1 Factor 1: Population and Housing Growth

Direct

Direct population growth at HPS would include the residents and employees who would occupy the new homes and businesses developed at this site. Alternative 3 would involve the construction of 4,000 housing units at HPS. At full build-out in 2030, the population at HPS would be 9,320 residents, based on a factor of 2.33 persons per household (see Section 3.6.3.1.2). Alternative 3 would also include development of new retail, R&D, and other uses, resulting in an estimated 6,956 new jobs (Table 4.6.6-1). In total, the population at HPS would represent 1.0 percent of the estimated citywide population of 916,800 in 2030, while employment would represent 0.9 percent of the 748,100 jobs in 2030 in San Francisco.

Table 4.6.6-1. Operation Phase Project Employment in Alternative 3

Land Use	Employment Factor[1]	Development Program in Alternative 3	Employment in Alternative 3 (jobs)
Residential	25 units/job	4,000 units	160
Neighborhood Retail	270 gft^2/job	125,000 gft^2	463
Research and Development	400 gft^2/job	2,500,000 gft^2	6,250
Football Stadium	2,915 jobs/event	0 events/year	0
Public Parking (Commercial and General)	270 spaces/job[2]	5,076 spaces	19
Parks and Open Space	0.26 jobs/ac[2]	244.6 ac	64
Total			**6,956**

Sources:
1. San Francisco Planning Department 2002, except as noted.
2. Economic & Planning Systems 2009.

Although Alternative 3 would result in an increase in population and employment at HPS, growth in this area has long been the subject of many planning activities. A primary objective of this alternative is to provide new housing and non-residential uses in support of planned redevelopment. Uses planned for HPS Phase I under the Redevelopment Plan are currently under construction. Alternative 3 is broadly consistent with the Bayview Jobs, Parks and Housing Initiative (Proposition G, approved by voters in 2008), although it excludes the development of a new football stadium (see Chapter 1 for a summary of the objectives of Proposition G). Other than the omission of the stadium, the uses provided as part of Alternative 3 support planned growth at the project site.

As a result of these ongoing planning activities, service providers in the City of San Francisco have been aware of the likely redevelopment, and have included future growth projections for HPS in their long-term operations plans. Alternative 3 would provide all onsite infrastructure for connections to city mains, and would include onsite treatment of stormwater runoff (see Section 3.10, Utilities and Section 3.11, Public Services for further description of the potential impacts of this alternative on infrastructure and services). In summary, the infrastructure needed to support the level of growth anticipated under Alternative 3 was planned based on population projections that included most of the housing, and all of the employment, associated with the HPS redevelopment.

Employment growth at HPS would be considered substantial if it resulted in housing demand that would exceed planned regional housing development. As shown in Table 4.6.6-2, Alternative 3 would result in

6,956 new jobs. Based on the Planning Department's projection of the number of workers in the average San Francisco household in 2025, the average household would be expected to have 1.36 workers (San Francisco Planning Department 2004a, Table I-14). This implies that each new job results in a need for 0.74 housing units. Consistent with existing commuting patterns described in Section 3.6.3.3, Employment and Income, it is assumed that 55 percent of the workers would seek housing in the City of San Francisco (USDOT 2006). The calculations also assume a vacancy rate of 4.7 percent (California Department of Finance 2009). Based on these assumptions, the development at HPS would result in a total demand for 5,355 housing units as a result of employment at HPS, including 2,945 units within San Francisco and 2,410 units outside the city.

Table 4.6.6-2. Alternative 3 Housing Demand

Item	*Estimate*	*Notes*
New employment	6,956 jobs	See Table 4.6.4-1.
Housing demand	5,355 units	Calculated as project employment divided by 1.36[1] workers per housing unit, and plus additional 4.7[2] percent housing units to account for vacancy rate.
Housing demand in San Francisco[3]	2,945 units	Calculated as housing demand times 55 percent, representing the fraction of workers assumed to seek housing in San Francisco.
Housing demand in other communities[3]	2,410 units	Calculated as housing demand times 45 percent, representing the fraction of workers assumed to seek housing outside San Francisco.

Sources:
1. San Francisco Planning Department 2004a, Table I-14.
2. California Department of Finance 2009.
3. USDOT 2006.

Total demand for housing at HPS would represent 2.5 percent of the total Bay Area housing need of 214,500 units (based on the RHNA targets; refer to Section 3.6.3.2.3, Regional Housing Needs Plan) projected by ABAG through 2014. While much of the population increase associated with employment at HPS could be accommodated at the project site, it is likely that some employees would elect to live elsewhere in the city or within surrounding Bay Area communities.

Based on existing commuting patterns, 2,945 housing units would be required in San Francisco to meet anticipated housing demand. The 4,000 housing units that would be developed at HPS would exceed the total demand for new units generated by employment at HPS; thus, this alternative would provide all necessary housing units to compensate for its increased housing demand, and would not contribute to excess housing demand in San Francisco. The alternative would also include a broad range of housing options of varying sizes, types, and levels of affordability. Because the new housing would be close to the jobs provided by Alternative 3, future employees at HPS may be more likely to seek housing at nearby developments (i.e., in proximity to the project site) prior to searching for housing in the surrounding BVHP neighborhood. In addition, the housing provided at HPS would be available to existing residents of the BVHP neighborhood should neighborhood residents wish to relocate to the project site.

A percentage of the persons employed at HPS would also likely choose to live in other areas in the City of San Francisco, or other cities in the Bay Area, for various personal and socioeconomic reasons. Based on existing commuting patterns, the demand for about 2,410 units would be generated in surrounding Bay Area communities by HPS development. This housing demand would be dispersed throughout the nine-county Bay Area, which would result in negligible potential increases in housing demand within the Bay Area.

It is not anticipated that employment at HPS would create a substantial demand for housing in the BVHP neighborhood, San Francisco, or the region in excess of the housing provided as part of Alternative 3 or the housing otherwise available in the Bay Area. To summarize, the need for infrastructure, public services, and housing associated with direct population growth proposed at HPS has been anticipated in ongoing local and regional planning activities. Therefore, all impacts associated with direct population growth would *not be significant* for HPS, and no mitigation is proposed.

Indirect

Infrastructure and services would be expanded to serve HPS, without excess capacity that might encourage additional local growth beyond that already planned for under Proposition G and under the redevelopment plans. The development at HPS would not expand infrastructure to geographic areas that were not previously served, nor would it create new transportation access to a previously inaccessible area. Therefore, all impacts associated with indirect population growth would not be significant for HPS, and no mitigation is proposed.

4.6.6.2.2 Factor 2: Displacement of Housing and Population

The HPS site does not contain housing units presently, so no direct displacement of housing units would occur in either the construction or operation phase. However, there is a potential for Alternative 3 to have indirect impacts related to displacement of existing residents. The alternative involves construction of 4,000 housing units. Table 4.6.6-3 provides a summary of the proposed affordable and below market rate units for Alternative 3. As indicated in the table, 20 percent of the units would be affordable and 25 percent would be below market rate. These figures exceed the requirements for SFRA affordable housing within Redevelopment Project Areas, which state that at least 15 percent (600) of all new units within the redevelopment areas must be affordable.

Alternative 3 has the potential to lead to displacement of existing residents if the employment opportunities associated with the project would lead to a disproportionate inflow of high-skill, high-income employees. As noted in Section 3.6.3.3, Employment and Income, educational attainment in the BVHP neighborhood is somewhat lower than in San Francisco as a whole or neighboring San Mateo County. This disparity in education levels could mean that new jobs, especially high-technology jobs, could go to people who reside outside the neighborhood and therefore eventually lead to displacement of existing residents.

Table 4.6.6-3. Proposed Affordable Housing Mix for Alternative 3

Description	***Units***
Total Housing Units Proposed	4,000
15% of Total Units (SFRA affordable housing requirement)	600
Proposed Agency Affordable Units	351
Proposed Inclusionary Units	451
SFRA Affordable Subtotal	802
Proposed SFRA Affordable Units (percent of total units)	20%
Workforce Units	182
Total Below Market Units	984
Proposed Below Market (percent of total units)	25%
Source: SFRA 2010.	

The majority of the new jobs associated with Alternative 3 would be in the R&D development, and there is no information at this time on the required education and skills for these jobs, since it is not known what firms would move into the newly developed area. Thus, it is unlikely that the increased employment opportunities that Alternative 3 would create would lead to displacement of current residents; instead, many current residents may be able to take advantage of the new employment opportunities.

The Community Benefits Plan agreement between the developer and the city (Appendix O) would ameliorate potential increases in property values via the Community Housing Fund (Section 4.1 of the Community Benefits Plan). In addition, the city and developer are negotiating a policy that would set a goal for 50 percent of all permanent workforce employment opportunities to be filled by San Francisco residents, with priority consideration first for residents of ZIP Code 94124, then second to other District 10 residents (i.e., residents of ZIP Codes 94134 and 94107).

In view of the specific financial commitments of the Community Benefits Plan's Community Housing Fund, the local workforce goal, and the fact that jobs associated with this Alternative are available to workers with a wide range of education levels and skill sets, the impacts with respect to indirect displacement related to new employment opportunities would *not be significant*. No mitigation is proposed.

4.6.6.2.3 Factor 3: Displacement of Businesses

All displacement or renovation of existing employment centers (i.e., artists' studios) would occur during the construction phase, and there would be *no impact* in the operation phase. Therefore, no mitigation is proposed.

4.6.6.2.4 Factor 4: Consistency with General Plan Elements

Alternative 3 would provide for redevelopment of the HPS site in a way that is generally consistent with the relevant policies and objectives of the San Francisco General Plan, as listed in Section 3.6, Socioeconomics. In particular, relative to the Housing Element, Alternative 3 is consistent with Policies 1.3, 1.7, 8.1, 8.4, and 8.9 because it would provide a mix of new housing types, including some units designed for renter occupancy and some designed for owner occupancy, and a mix of affordability ranges, all within a former industrial area. Under Alternative 3, HPS – along with the Candlestick Point development proposed in the related EIR – would provide a mix of market-rate and affordable units; therefore, this alternative is consistent with Policies 1.5, 4.1, 4.2, and 12.2. The alternative is consistent with Policies 11.1, 11.2, 11.3, 11.5, and 11.8 because it would enhance the redevelopment efforts of the BVHP neighborhood. This alternative would meet the housing demand it generates, even without consideration of the related developments. Thus, it is consistent with Policy 1.9.

In terms of the Commerce and Industry Element, Alternative 3 would encourage development that provides substantial net benefits in the form of employment, housing, and revitalization of neighborhoods; therefore, it is consistent with Policies 1.1 and 1.2. Because it would promote the attraction of new commercial and industrial firms, with a particular focus on emerging activities such as artistry and crafts and green technology, and the employment opportunities it would provide allow for a mix of skill and educational levels, it fulfills the intent of Policies 2.1, 3.1, 3.4, and 4.2. The city would also promote the hiring of local residents for project construction, which would be consistent with Policy 3.2. Because Alternative 3 would promote a mix of residential, commercial, and other uses that would contribute to neighborhood revitalization in BVHP, it is consistent with Policies 6.1, 6.3, 6.5, and 6.10.

Alternative 3 would increase available space for artists and arts organizations within an existing arts cluster. It is also the outgrowth of a planning process that has incorporated the active participation of artists and arts organizations for the redevelopment of a decommissioned military facility. Thus, it is compatible with all relevant policies in the Arts Element of the General Plan.

In summary, this alternative would have *no impact* relative to consistency with the relevant elements of the San Francisco General Plan.

Minor changes to the project footprint associated with construction of Tower Variant D and the Building Preservation option would not cause substantial differences. Therefore, socioeconomic impacts would not be different for this factor.

4.6.7 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

4.6.7.1 Construction Impacts

4.6.7.1.1 Factor 1: Population and Housing Growth

As in Alternative 1, there would be direct, temporary construction job growth at the project site as a result of Alternative 4. Thus, there would be at most an average of 275 and a maximum of 342 workers onsite in the peak year. Development of Alternative 4 would not generate a substantial, unplanned population increase, or a related demand for additional housing units. Therefore, impacts associated with construction employment would *not be significant*, and no mitigation is proposed.

4.6.7.1.2 Factor 2: Displacement of Housing and Population

There are no existing housing units at HPS. Therefore, build-out of Alternative 4 would not replace housing units with new uses, and no existing residents would be displaced. Because there would be no residential displacement at HPS, development of Alternative 4 would have *no impact* on displacement of housing and residents at this site. Therefore, no mitigation is proposed.

4.6.7.1.3 Factor 3: Displacement of Businesses

This alternative would not result in a net loss of employment for the about 100 studio artists presently working on the project site. However, depending on the timing between displacement of the artists from existing studios and construction of new studios, and depending on the difference in costs to rent existing studios versus costs to rent the new studios, the displacement and relocation would affect the studio artist population. However, an Artists Relocation Plan agreement between the City and County of San Francisco and the developer to ensure that existing artists already occupying space at HPS will be able to move to another studio on the shipyard site at reasonable cost is designed to alleviate this impact. Therefore, the impact of displacing artists' studios would *not be significant* and no mitigation is proposed.

Construction activities would result in some temporary disruptions to traffic flows, both within the HPS development area and on nearby roadways that provide access to the redevelopment area. However, because of the peninsular geography of the HPS site and the fact that a limited number of businesses are located on or immediately adjacent to the site, it is expected that impacts to access disruptions on the economic viability of businesses in the analysis area would *not be significant* and no mitigation is proposed.

4.6.7.2 Operational Impacts

4.6.7.2.1 Factor 1: Population and Housing Growth

Direct

Direct population growth at HPS would include the residents and employees who would occupy the new homes and businesses developed at this site. Alternative 4 would involve the construction of 1,855 housing units at HPS. At full build-out in 2030, the population at HPS would be 4,322 residents, based on a factor of 2.33 persons per household (Section 3.6.3.1.2, BVHP Neighborhood and Project Site). Alternative 4 would also include development of new retail, R&D, and other uses, resulting in an estimated 4,846 new jobs (Table 4.6.7-1). In total, the population at HPS would represent 0.5 percent of the estimated citywide population of 916,800 in 2030, while employment would represent 0.6 percent of the 748,100 jobs in 2030 in San Francisco.

Table 4.6.7-1. Operation Phase Project Employment in Alternative 4

Land Use	*Employment Factor*[1]	*Development Program in Alternative 4*	*Employment in Alternative 4 (jobs)*
Residential	25 units/job	1,855 units	74
Neighborhood Retail	270 gft[2]/job	87,500 gft[2]	324
Research and Development	400 gft[2]/job	1,750,000 gft[2]	4,375
Football Stadium	2,915 jobs/event	0 events/year	0
Public Parking (Commercial and General)	270 spaces/job[2]	2,583[3]	9[3]
Parks and Open Space	0.26 jobs/ac[2]	244.6 ac	64
Total			**4,846**

Notes:
Estimated based on commercial and general parking levels approximately half of that described for Alternative 3.
Sources:
1. San Francisco Planning Department 2002, except as noted.
2. Economic & Planning Systems 2009.

Although Alternative 4 would result in an increase in population and employment at HPS, growth in this area has long been the subject of many planning activities. A primary objective of this alternative is to provide new housing and non-residential uses in support of planned redevelopment. Alternative 4 is broadly consistent with the Bayview Jobs, Parks and Housing Initiative (Proposition G, approved by voters in 2008), although it excludes the development of a new football stadium (see Chapter 1 for a summary of the objectives of Proposition G). Other than the omission of the stadium, the uses provided as part of Alternative 4 support planned growth at the project site.

As a result of these ongoing planning activities, service providers in the City of San Francisco have been aware of the likely redevelopment, and have included future growth projections for HPS in their long-term operations plans. Alternative 4 would provide all onsite infrastructure for connections to city mains, and would include onsite treatment of storm water runoff (see Section 3.10, Utilities and Section 3.11, Public Services for further description of the potential impacts of this alternative on infrastructure and services). In summary, the infrastructure needed to support the level of growth anticipated under Alternative 4 was planned based on population projections that included all of the housing and employment associated with the HPS redevelopment.

Employment growth at HPS would be considered substantial if it resulted in housing demand that would exceed planned regional housing development. As shown in Table 4.6.7-1, Alternative 4 would result in 4,846 new jobs. Based on the Planning Department's projection of the number of workers in the average city household in 2025, the average household would be expected to have 1.36 workers (San Francisco Planning Department 2004a, Table I-14). (Note that no forecast data are available for 2030.) This implies that each new job results in a need for 0.74 housing units. Consistent with existing commuting patterns described in Section 3.6.3.3, Employment and Income, it is assumed that 55 percent of the workers would seek housing in the City of San Francisco (USDOT 2006). The calculations also assume a vacancy rate of 4.7 percent (California Department of Finance 2009). Based on these assumptions, the development at HPS would result in a total demand for 3,731 housing units as a result of employment at HPS, including 2,052 units within San Francisco and 1,679 units outside the city.

Table 4.6.7-2. Alternative 4 Housing Demand

Item	Estimate	Notes
New employment	4,846 jobs	See Table 4.6.7-1.
Housing demand	3,731 units	Calculated as project employment divided by 1.36[1] workers per housing unit, and plus additional 4.7[2] percent housing units to account for vacancy rate.
Housing demand in San Francisco[3]	2,052 units	Calculated as housing demand times 55 percent, representing the fraction of workers assumed to seek housing in San Francisco.
Housing demand in other communities[3]	1,679 units	Calculated as housing demand times 45 percent, representing the fraction of workers assumed to seek housing outside San Francisco.

Sources:
1. San Francisco Planning Department 2004a, Table I-14.
2. California Department of Finance 2009.
3. USDOT 2006.

Total demand for housing at HPS would represent 1.7 percent of the total Bay Area housing need of 214,500 units (based on the RHNA targets; refer to Section 3.6.3.2.3, Regional Housing Needs Plan) projected by ABAG through 2014. While much of the population increase associated with employment at HPS could be accommodated at the project site, it is likely that some employees would elect to live elsewhere in the city or within surrounding Bay Area communities.

Based on existing commuting patterns, 2,052 housing units would be required in San Francisco to meet anticipated housing demand. The 1,855 housing units that would be developed at HPS would be less than the total demand for new units generated by employment at HPS; however, units being constructed at HPS Phase I and those proposed for other nearby projects (such as Candlestick Point) would offset HPS housing demand. The analysis of cumulative project impacts in Chapter 5 discusses the neighboring projects and cumulative impacts in more detail. A broad range of housing options of varying sizes, types, and levels of affordability would be developed at HPS Phase I (which is addressed in the 2000 FEIS and is presently under development), HPS (the subject of the present SEIS), and at Candlestick Point, which is the subject of an EIR prepared by the City and County of San Francisco. Because the new housing would be close to the jobs provided by Alternative 4, future employees at HPS may be more likely to seek housing at other nearby developments (i.e., in proximity to the project site) prior to searching for housing in the surrounding BVHP neighborhood. In addition, the housing provided at HPS would be available to existing residents of the BVHP neighborhood should neighborhood residents wish to relocate to the project site.

A percentage of the persons employed at HPS would also likely choose to live in other areas in the City of San Francisco, or other cities in the Bay Area, for various personal and socioeconomic reasons. Based on existing commuting patterns, the demand for about 1,679 units would be generated in surrounding Bay Area communities by HPS development. This housing demand would be dispersed throughout the nine-county Bay Area, which would result in negligible potential increases in housing demand within the Bay Area.

It is not anticipated that employment at HPS would create a substantial demand for housing in the BVHP neighborhood, San Francisco, or the region in excess of the housing provided as part of Alternative 4 or the housing otherwise available in the Bay Area. To summarize, the need for infrastructure, public services, and housing associated with direct population growth proposed at HPS has been anticipated in ongoing local and regional planning activities. Therefore, all impacts associated with direct population growth would *not be significant* for HPS, and no mitigation is required.

Indirect

Infrastructure and services would be expanded to serve HPS, without excess capacity that might encourage additional local growth beyond that already planned for under Proposition G and under the redevelopment plans. The development at HPS would not expand infrastructure to geographic areas that were not previously served, nor would it create new transportation access to a previously inaccessible area. Therefore, all impacts associated with indirect population growth would *not be significant* for HPS, and no mitigation is proposed.

4.6.7.2.2 Factor 2: Displacement of Housing and Population

There would be no direct impacts related to displacements of existing structures. The HPS site does not contain housing units presently, so no direct displacement of housing units would occur in either the construction or operation phase.

However, as for Alternative 1, there is a potential for Alternative 4 to have indirect impacts related to displacement of existing residents. The alternative involves construction of 1,855 housing units. Table 4.6.7-3 provides a summary of the proposed affordable and below market rate units for Alternative 4. As indicated in the table, 17 percent of the units would be affordable and 21 percent would be below market rate. These figures exceed the requirements for SFRA affordable housing within Redevelopment Project Areas, which state that at least 15 percent (279) of all new units within the redevelopment areas must be affordable.

Table 4.6.7-3. Proposed Affordable Housing Mix for Alternative 4

Description	***Units***
Total Housing Units Proposed	1,855
15% of Total Units (SFRA affordable housing requirement)	279
Proposed Agency Affordable Units	155
Proposed Inclusionary Units	165
SFRA Affordable Subtotal	320
Proposed SFRA Affordable Units (percent of total units)	17%
Workforce Units	71
Total Below Market Units	391
Proposed Below Market (percent of total units)	21%

Source: SFRA 2010.

Alternative 4 has the potential to lead to displacement of existing residents if the employment opportunities associated with the project would lead to a disproportionate inflow of high-skill, high-income employees. As noted in Section 3.6.3.3, Employment and Income, educational attainment in the BVHP neighborhood is somewhat lower than in San Francisco as a whole or neighboring San Mateo County. This disparity in education levels could mean that new jobs, especially high-technology jobs, could go to people who reside outside the neighborhood and therefore eventually lead to displacement of existing residents.

The majority of the new jobs associated with Alternative 4 would be in the R&D development, and there is no information at this time on the required education and skills for these jobs, since it is not known what firms will move into the newly developed area. Thus, it is unlikely that the increased employment opportunities that Alternative 4 would create would lead to displacement of current residents; instead, many current residents may be able to take advantage of the new employment opportunities.

The Community Benefits Plan agreement between the developer and the city (Appendix O) would ameliorate potential increases in property values via the Community Housing Fund (Section 4.1 of the

Community Benefits Plan). In addition, the city and developer are negotiating a policy that would set a goal for 50 percent of all permanent workforce employment opportunities to be filled by San Francisco residents, with priority consideration first for residents of ZIP Code 94124, then second to other District 10 residents (i.e., residents of ZIP Codes 94134 and 94107).

In view of the specific financial commitments of the Community Benefits Plan's Community Housing Fund, the local workforce goal, and the fact that jobs associated with this alternative are available to workers with a wide range of education levels and skill sets, the impacts with respect to indirect displacement related to new employment opportunities would *not be significant*, and no mitigation is proposed.

4.6.7.2.3 Factor 3: Displacement of Businesses

All displacement or renovation of existing employment centers (i.e., artists' studios) would occur during the construction phase, and there would be *no impact* in the operation phase. Therefore, no mitigation is proposed.

4.6.7.2.4 Factor 4: Consistency with General Plan Elements

Alternative 4, like Alternative 1, would provide for redevelopment of the HPS site in a way that is generally consistent with the relevant policies and objectives of the San Francisco General Plan, as listed in Section 3.6, Socioeconomics. In particular, relative to the Housing Element, Alternative 4 is consistent with Policies 1.3, 1.7, 8.1, 8.4, and 8.9 because it would provide a mix of new housing types, including some units designed for renter and some designed for owner occupancy, and a mix of affordability ranges, all within a former industrial area. Under Alternative 4, HPS – along with the Candlestick Point development proposed in the related EIR – would provide a mix of market-rate and affordable units; therefore, this alternative is consistent with Policies 1.5, 4.1, 4.2, and 12.2. The alternative is consistent with Policies 11.1, 11.2, 11.3, 11.5, and 11.8 because it would enhance the redevelopment efforts of the BVHP neighborhood. Although this alternative would not meet the housing demand it would generate as a stand-alone project, it would meet that demand when considered together with the related development of Candlestick Point, which would provide an additional 7,850 housing units. Thus, when considered jointly, this alternative is consistent with Policy 1.9.

In terms of the Commerce and Industry Element, Alternative 4 would encourage development that provides substantial net benefits in the form of employment, housing, and revitalization of neighborhoods; therefore, it is consistent with Policies 1.1 and 1.2. Because it would promote the attraction of new commercial and industrial firms, with a particular focus on emerging activities such as artistry and crafts and green technology, and the employment opportunities it would provide allow for a mix of skill and educational levels, it fulfills the intent of Policies 2.1, 3.1, 3.4, and 4.2, although to lesser degree than Alternatives 1 through 3, which provide more space for emerging industries in green technology. The city would also promote the hiring of local residents for project construction, which would be consistent with Policy 3.2. Because Alternative 4 promotes a mix of residential, commercial, and other uses that would contribute to neighborhood revitalization in BVHP, it is consistent with Policies 6.1, 6.3, 6.5, and 6.10. However, it fulfills the intent of these policies less well than Alternatives 1 through 3, which all provide more space for employment opportunities associated with emerging technologies.

Although it does not increase the amount of space set aside for arts, Alternative 4 would secure the same amount of space as exists presently for artists and arts organizations. It is also the outgrowth of a planning process that has incorporated the active participation of artists and arts organizations for the redevelopment of a decommissioned military facility. Thus, it is compatible with all relevant policies in the Arts Element of the General Plan.

In summary, this alternative would have *no impact* relative to consistency with the relevant elements of the San Francisco General Plan.

4.6.8 No Action Alternative

4.6.8.1 Construction Impacts

4.6.8.1.1 Factor 1: Population and Housing Growth

Because the No Action Alternative would involve no new construction on the HPS site, there would be *no impacts* from construction-related population or housing.

4.6.8.1.2 Factor 2: Displacement of Housing and Population

There are no existing housing units at HPS. Therefore, the No Action Alternative would have *no impact* on displacement of housing and residents at this site.

4.6.8.1.3 Factor 3: Displacement of Businesses

As discussed in Section 3.6.3.3, Employment and Income, existing employment in the project site consists of about 100 studio artists, as well as a small number of contract and temporary jobs (about 16 full-time equivalent jobs) associated with security, maintenance, and environmental cleanup. The No Action Alternative would involve no change to current employment levels or business activity on the site. Current security, maintenance, and cleanup activities as well as artists' use of studio space would be the same into the future. Therefore, there would be *no impacts* associated with displacement of businesses.

4.6.8.2 Operational Impacts

4.6.8.2.1 Factor 1: Population and Housing Growth

Direct

There would be no population growth at HPS under the No Action Alternative. No changes would occur compared to current population levels (see Table 4.6.8-1).

Table 4.6.8-1. Operation Phase Project Employment in the No Action Alternative

Land Use	*Employment Factor*[1]	*Development Program in the No Action Alternative*	*Employment in the No Action Alternative (jobs)*
Residential	25 units/job	0 units	0
Neighborhood Retail	270 gft[2]/job	0 gft[2]	0
Research and Development	400 gft[2]/job	0 gft[2]	0
Football Stadium	2,915 jobs/event	0 events/year	0
Public Parking (Commercial and General)	270 spaces/job[2]	0	0
Parks and Open Space	0.26 jobs/ac[2]	0	0
Mixed Use	Existing employment	0 gft[2]	16 (other)
Cultural and Education	Existing employment	0 gft[2]	100
Total	Existing employment		**116**

Sources:
1. San Francisco Planning Department 2002, except as noted.
2. Economic & Planning Systems 2009.

The No Action Alternative would result in no change to population or employment at HPS. There would be *no impacts* from operations.

Indirect

As infrastructure, public services, roads, and other services and communities amenities would not expanded, there would be *no indirect impacts* to population or housing.

4.6.8.2.2 Factor 2: Displacement of Housing and Population

The HPS site does not contain housing units and no new housing would be constructed, so no direct displacement of housing units would occur in either the construction or operation phase. There would be *no direct impacts* related to displacements of existing structures.

4.6.8.2.3 Factor 3: Displacement of Businesses

There would be *no impact* in the operation phase because no change would occur to existing facilities, employment, or activities.

4.6.8.2.4 Factor 4: Consistency with General Plan Elements

The No Action Alternative would retain the status quo with respect to the project site. Since no housing would be provided by the project, and the site would not be disposed of by DoN, Housing Element policies would not apply to the No Action Alternative. Therefore, Policies 1.3, 1.5, 1.7, 1.9, 4.1, 4.2, 8.1, 8.4, and 8.9 do not apply. For the same reasons, Policies 11.1, 11.2, 11.3, 11.5, 11.8, 11.9, and 12.2 would also not apply. In terms of the Commerce and Industry Element, since no development would occur, these policies would not apply to the No Action Alternative.

Although it does not increase the amount of space set aside for arts, the No Action Alternative would retain the same amount of space as exists currently for artists and arts organizations on DoN-owned property. It is also the outgrowth of a planning process that has incorporated the active participation of artists and arts organizations for the redevelopment of a decommissioned military facility. Thus, it is compatible with relevant policies in the Arts Element of the General Plan.

In summary, the No Action alternative would have *no significant impact* relative to consistency with the relevant elements of the San Francisco General Plan since most policies would not apply. With regard to those policies that do apply (two Art Element Policies 6-1.6 and 6-1.11), the No Action Alternative would be consistent.

4.6.9 Mitigation

The proposed action and alternatives would not result in significant impacts to socioeconomics. No mitigation is proposed.

4.7 Hazards and Hazardous Substances

4.7.1 Methodology

The analysis of reuse alternatives presented in this section is based on conditions as they existed in 2007 through 2010. See Section 3.7, Hazards and Hazardous Substances, for a description of the regulatory framework, the DoN's environmental restoration program, and existing site conditions related to hazards and hazardous substances, and a summary of the ongoing environmental management and restoration programs at HPS. The following impact analyses also consider the potential human health effects associated with the use and management of hazardous materials and potential releases of hazardous waste. Regulatory compliance requirements are described in Section 3.7.3, Compliance Programs.

4.7.1.1 Significance Factors

Factors considered in determining whether an alternative would have a significant impact related to hazardous materials and substances included the extent or degree to which an alternative would:

Factor 1 Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, substances, or wastes; or

Factor 2 Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

4.7.1.2 Analytic Method

4.7.1.2.1 Scope of Impact Analysis for Hazards and Hazardous Substances

As noted in Section 3.7, Hazards and Hazardous Substances, HPS was placed on the CERCLA NPL on 21 November 1989, and subsequent CERCLA investigation and remedial actions have been and continue to be conducted at HPS under the DoN's ERP. DoN is implementing CERCLA response actions (both remedial and removal) to address releases of hazardous substances at HPS in accordance with CERCLA, the NCP, and the FFA that will ensure adequate protection of human health and the environment. Potential environmental effects of the remedial activities (i.e., soil excavation, soil transport, and operation of treatment systems) have been, and will continue to be, evaluated by DoN and regulatory agencies in conjunction with the approval process for specific response actions selected and implemented by the DoN under CERCLA. Appropriate controls to protect human health and the environment have been, and will continue to be, incorporated into the design and implementation of those remedial actions. This program is ongoing, regardless of whether the installation was recommended for disposal under the BRAC program.

More specifically, CERCLA, DERP, and NCP provisions require that DoN implement all remedial actions necessary to adequately protect human health and the environment from risks associated with the actual or potential release of hazardous substances, pollutants, or contaminants into the environment. This fundamental "threshold" requirement of CERCLA (Section 121(b) of CERCLA, 42 U.S.C. 9621(b)), and the NCP (40 CFR 300.430(f)(1)(i)(A)) applies regardless of future ownership of HPS property or the legal authority utilized to convey the property from DoN to another legal entity.

CERCLA and the NCP also require that CERCLA response actions selected by the DoN and approved by the FFA Signatories comply with a wide range of applicable or relevant and appropriate federal and state laws and regulations during the course of and at the completion of remedial action. For example, the

DoN has committed in CERCLA workplans approved by the FFA Signatories to comply with the substantive asbestos dust mitigation requirements of 17 CCR 93105 during the course of CERCLA response actions in order to ensure adequate protection of human health and the environment.

These requirements can be satisfied by different types and combinations of remedial actions, including excavation and disposal, treatment, and containment of hazardous substances, pollutants, or contaminants and institutional controls (ICs) that are evaluated and ultimately selected in a CERCLA Record of Decision (remedial action) or CERCLA Action Memorandum (removal action).

ICs, which are one of these remedial actions, consist of a set of legal and administrative mechanisms to implement land use restrictions to limit the exposure of future landowner(s) and/or user(s) of the property to hazardous substances present on the property, and to ensure the integrity of remedial action. ICs will be selected as a component of remedial action in areas of HPS where residual levels of hazardous substances will remain at concentrations that are not suitable for unrestricted use. ICs are necessary to provide adequate protection of human health and the environment. Implementation of ICs will allow the property to be developed for its intended use, subject to land use restrictions designed to prevent exposure to residual levels of hazardous materials. ICs include requirements for monitoring and inspections and reporting to ensure compliance with land use or activity restrictions. For more information on the ongoing environmental management and restoration programs at HPS, including ICs, see Section 3.7, Hazards and Hazardous Substances.

DoN, USEPA, DTSC, RWQCB, and the California Department of Public Health (CDPH) will, independent of the proposed action and this SEIS, require that before any project site development activity occurs at HPS, appropriate and legally enforceable CERCLA ICs in the form of a recorded covenant, deed provision, easement, or lease term are in effect and applicable. Prior to any transfer or lease of HPS property, DoN must ensure that actual or potential releases of hazardous substances have been addressed that will ensure the protection of human health and the environment following transfer (Section 120(h) of CERCLA, 42 U.S.C. 9620(h)). As explained in Section 3.7.4.2,Overview of the Environmental Investigation and Cleanup Process, any deed transferring title to real property shall contain, to the extent required by law, the notices, descriptions, covenants, and assurances specified in Section 120(h) as well as ICs required as a CERCLA remedial action. Such compliance will ensure that the property after transfer will be used in a manner that is adequately protective of the environment and human health as required by CERCLA.

For CERCLA sites other than those recommended for No Further Action, DoN may, when appropriate, place limits on land reuse through deed restrictions on conveyance and use restrictions on leases. DoN, DTSC, USEPA, and the RWQCB may also retain right-of-access to some properties to inspect monitoring wells or to conduct other remedial activities. Actions taken in accordance with these restrictions would not result in a hazard to the public or the environment.

In addition, the future developer and/or landowner will be required to obtain all applicable local and state permits, approvals, planning reviews, consultations, and adhere to all applicable building, zoning, environmental, and health and safety laws and regulations before and during the redevelopment of HPS following disposal of the property by the DoN. For the reasons set forth above, including the completed and ongoing CERCLA remedial actions, appropriate and legally enforceable CERCLA ICs, and the expectation that the future developer or owner of the HPS property would adhere to local, state, and federal laws and regulations during the construction and operation, there would be no hazard to the public or the environment, no reasonably foreseeable environmental impacts, and no significant environmental impacts as a result of releases of hazardous substances, pollutants, or contaminants during development or operation of the proposed action at HPS that are addressed under CERCLA.

4.7.1.2.2 Scope of Impact Analysis for Hazardous Substances Use during Occupancy

The analysis assumes reuse of the HPS property, following disposal by the DoN, would involve the routine use of hazardous materials at varying levels. Quantification of precise amounts of additional hazardous materials use associated with new proposed uses is not practical at this stage of proposed action development. Therefore, the analysis qualitatively evaluates broad categories of hazardous materials use, ranging from research and development, in which a wide variety of hazardous materials would be used, to facilities such as the proposed stadium, where fuels and maintenance products would comprise the majority of hazardous materials, to smaller-scale users, such as artists' studios and households. For purposes of the analysis, compliance with existing federal, state, and local laws and regulations pertaining to hazardous materials management is presumed to be sufficient to minimize health and safety risks, and state and local agencies would be expected to continue to enforce applicable requirements to the extent they do so now. The local requirements discussed in this section are evaluated as they would apply during future occupancy and use by transferee(s) after DoN has conveyed the property. They do not apply to DoN's CERCLA cleanup program because local requirements are not federal or state "applicable or relevant and appropriate" requirements (see Subsections 121(d) and (e) of CERCLA; 42 U.S.C. 9621(d) and (e)).

4.7.2 Alternative 1: Stadium Plan Alternative

4.7.2.1 Construction Impacts

4.7.2.1.1 Factors 1 and 2: Construction Impacts from the Presence of Hazardous Substances

Implementation of Alternative 1 would involve construction to accommodate new development. Construction would include demolition, excavation, trenching, grading and compaction, and other earth-disturbing activities.

As discussed above, CERCLA, DERP, and NCP provisions require that DoN implement all remedial actions necessary to adequately protect human health and the environment from risks associated with the actual or potential release of hazardous substances, pollutants, or contaminants into the environment. This requirement of CERCLA applies regardless of future ownership of HPS property or the legal authority utilized to convey the property from DoN to another legal entity. CERCLA and the NCP also require that CERCLA response actions selected by the DoN and approved by the FFA Signatories comply with a wide range of applicable or relevant and appropriate federal and state laws and regulations during the course of and at the completion of remedial action. For example, the DoN has committed in CERCLA workplans approved by the FFA Signatories to comply with the substantive asbestos dust mitigation requirements of 17 CCR 93105 during the course of CERCLA response actions in order to ensure adequate protection of human health and the environment.

These requirements can be satisfied by different types and combinations of remedial actions (including excavation and disposal, treatment, and containment of hazardous substances, pollutants, or contaminants and ICs) that are evaluated and ultimately selected in a CERCLA Record of Decision (ROD) (remedial action) or CERCLA Action Memorandum (removal action).

ICs will be selected as a component of remedial action in areas of HPS where residual levels of hazardous substances will remain at concentrations that are not suitable for unrestricted use and ICs are necessary to provide adequate protection of human health and the environment. Implementation of ICs will allow the property to be developed for its intended use, subject to land use restrictions designed to prevent exposure to residual levels of hazardous materials. ICs include requirements for monitoring and inspections and reporting to ensure compliance with land use or activity restrictions.

DoN, USEPA, DTSC, RWQCB, and CDPH will, independent of the proposed action and this SEIS, require that before any project site development activity occurs at HPS, appropriate and legally enforceable CERCLA ICs in the form of a recorded covenant, deed provision, easement, or lease term are in effect and applicable. Prior to any transfer or lease of HPS property, DoN must ensure that actual or potential releases of hazardous substances have been addressed that will ensure the protection of human health and the environment following transfer. Any deed transferring title to real property shall contain, to the extent required by law, the notices, descriptions, covenants, and assurances specified in Section 120(h) as well as ICs required as a CERCLA remedial action. Such compliance will ensure that the property after transfer will be used in a manner that is adequately protective of the environment and human health as required by CERCLA.

Further, the future developer or owner of the property would be required to manage hazardous materials and wastes in accordance with applicable federal, state, and local regulations. In addition, the future developer and/or landowner would be required to obtain all applicable local and state permits, approvals, planning reviews, consultations, and adhere to all applicable building, zoning, environmental, and health and safety laws and regulations before and during the redevelopment of HPS following disposal of the property by the DoN.

For the reasons set forth above, including the completed and ongoing CERCLA remedial actions, appropriate and legally enforceable CERCLA ICs, and the expectation that the future developer or owner of the HPS property would adhere to local, state, and federal laws and regulations during the construction and operation, there would be no hazard to the public or the environment, *no reasonably foreseeable environmental impacts*, and no significant environmental impacts as a result of releases of hazardous substances, pollutants, or contaminants during construction activities at HPS. Therefore, no mitigation is proposed.

4.7.2.2 Operational Impacts

After proposed action development and occupancy, operation of infrastructure and land uses could involve the use of products that could contain hazardous materials. In addition, maintenance activities could disturb site soils that contain hazardous substances.

4.7.2.2.1 Factor 1: Routine Use, Storage, Transport, or Disposal of Hazardous Materials

Nearly all proposed action uses would involve the presence of hazardous materials (or products containing hazardous materials) at varying levels, and this would represent an increase in hazardous materials use compared to existing conditions. It would also increase the number of people who could be exposed to potential health and safety risks associated with routine use. The following summarizes the general types of hazardous materials that would be expected in association with the proposed action, based on the proposed land use designations.

Households and businesses, such as retail stores, restaurants, hotel, entertainment venues, artists' studios, and office-based commercial businesses, would use relatively small quantities of hazardous materials. Typical products containing hazardous materials would consist mostly of household-type cleaning products as well as maintenance products (e.g., paints, solvents, cleaning products); fuels and other petroleum products; refrigerants associated with building mechanical and heating, ventilation and air conditioning systems; and some media used by artists. Grounds and landscape maintenance within the development area could also use a wide variety of commercial products formulated with hazardous materials, including fuels, cleaners and degreasers, solvents, paints, lubricants, adhesives, sealers, and pesticides/herbicides. Under Alternative 1, a similar range of maintenance products containing hazardous materials would routinely be used.

The proposed R&D land uses are likely to include businesses and facilities supporting "green" technologies, in which some laboratory-based activities would be reasonably anticipated. Some R&D operations could involve "dry" laboratories (or operations), where relatively small or negligible quantities of hazardous materials would be used because the space would typically be used for office-based research, software development, or other related uses. In those cases, the types of hazardous materials would be limited to such items as cleaning and maintenance materials, and office products such as adhesives and glues. "Wet" research lab functions could involve a broad spectrum of activities involving hazardous materials, which would be used in controlled environments (e.g., fume hoods and special rooms). The types and volumes of hazardous materials that would be used in wet research is difficult to predict because the specific businesses that could operate research and development facilities are not known, and because hazardous materials use is subject to continuous change as technologies evolve and as businesses change. However, it is reasonably foreseeable that hazardous materials would be used routinely. Research and development businesses would be subject to more intense regulation and oversight than businesses (and households) that handle smaller quantities of more common materials. Employees performing wet laboratory work would be required by law to receive specific training, which is intended to protect the workplace as well as to minimize the potential for spills or inadvertent releases that could adversely affect the environment through air emissions or releases to sewers, storm drains, or land.

Additionally, the types of hazardous materials that are typically used at marinas include fuel, oil, and maintenance products for boats. Therefore, underground fuel storage tanks and waste oil drums could be present at the project site during operation of the marina.

If medical-related establishments (i.e., doctor/dentist offices, medical laboratories, or pharmacies) operate within the commercial areas of the project site, small amounts of laboratory-type chemicals, compressed gases, pharmaceuticals, and radiological materials would be used and stored. Medical, biohazardous, and low-level radioactive wastes would be produced from these activities.

For Alternative 1, there are no large-scale manufacturing or processing facilities proposed that would store and use large quantities of hazardous materials that would present a substantial risk to people. However, there would be numerous locations where smaller quantities of hazardous materials would be present. The potential risks associated with hazardous materials handling and storage would generally be limited to the immediate area where the materials would be located, because this is where exposure would be most likely. For this reason, the individuals most at risk would be employees or others in the immediate vicinity of the hazardous materials, rather than residents or visitors. For the most part, the health and safety procedures that protect workers and other individuals in the immediate vicinity of hazardous materials would also protect the adjacent community and environment. The pathways through which the community or the environment (e.g., local air quality and biota) could be exposed to hazardous materials include air emissions, transport of hazardous materials to or from the site, waste disposal, human contact, and accidents. However, the only primary potential pathway for public exposure to hazardous materials would be airborne emissions under normal operations or upset conditions, such as those caused by diesel particulate matter, toxic air contaminants, or traffic-related $PM_{2.5}$ emissions.

Hazardous materials would routinely be transported to, from, and within the project site, and small amounts of hazardous waste would be removed and transported offsite to licensed disposal facilities. The precise increase in the amount of hazardous materials/waste transported to or from the project site cannot be definitively predicted due to the pending selection of tenants for the future retail - commercial stores. But it is reasonable to assume with the addition of new land uses involving hazardous materials use, there would be an increase in transportation relative to current conditions. Such transportation would be in compliance with the existing hazardous materials regulations.

As indicated in Section 3.7.3, Compliance Programs, there is an established, comprehensive framework independent of the NEPA process, which is intended to reduce the risks associated with hazardous materials use (and generation of hazardous waste). The DPH Hazardous Materials Unified Program Agency (HMUPA) has been granted authority by the state to enforce most regulations pertaining to hazardous materials in the city, including permitting for hazardous materials storage, underground storage tanks, and hazardous waste generation, under the DPH Certificate of Registration Program.

Facilities where hazardous materials would be used during proposed action operation would be constructed in accordance with current laws and regulations, which require storage that minimizes exposure to people or the environment, including the potential for inadvertent releases (*San Francisco Health Code* Article 22). The use of hazardous materials and generation of wastes would continue to be regulated under the authority of the DPH HMUPA, under a compliance certificate, with additional oversight by other agencies, including the CDPH. DPH HMUPA would conduct periodic inspections to ensure that hazardous materials and wastes are being used and stored properly. Transportation would be in compliance with the existing hazardous materials regulations. Routine maintenance operations would be expected to be conducted in accordance with the applicable, and legally enforceable, CERCLA ICs, and adhere to local, state, and federal regulations and laws.

For these reasons, hazardous materials uses and waste generation for proposed action operations and routine maintenance operations would not pose a substantial public health or safety hazard to the project vicinity. Impacts from the routine transport, use, or disposal of hazardous materials/waste (including radiological, hazardous, and medical wastes) from operation of Alternative 1 would therefore *not be significant*, and no mitigation is proposed.

4.7.2.2.2 Factor 2: Exposure to Hazardous Materials via Upset and Accident Conditions

Potential hazards from routine use, storage, transport, or disposal of hazardous materials are addressed above. Therefore, the following discussion focuses on risks to the public from exposure to accidental releases of hazardous materials through reasonably foreseeable upset and accident conditions during operation of the proposed action.

With increased routine use of hazardous materials compared to existing conditions, exposure of future occupants, visitors, and employees to hazardous materials could occur by improper handling or use of hazardous materials or hazardous wastes during operation of the proposed action, particularly by untrained personnel, environmentally unsound disposal methods, or fire, explosion, or other emergencies, all of which could result in adverse health effects. Accidents involving the transportation of hazardous materials to, from, or within the project site could also occur.

In general, the types and amounts of hazardous materials would not pose any greater risk of upset or accident compared to other similar development elsewhere in the city. No industrial manufacturing or processing activities using large amounts of hazardous materials or acutely hazardous materials, which typically pose a greater accident or upset risk, are proposed. Major hazardous materials accidents associated with retail - commercial uses, including restaurants, theaters, and stores are extremely infrequent. Moreover, releases, if any, present a greater, although manageable, risk to immediately exposed individuals rather than the population at large. The San Francisco Fire Department (SFFD) responds to hazardous materials incidents within the city and additional emergency response capabilities are not anticipated to be necessary to respond to the potential incremental increase in the number of incidents that could result from operation of the proposed action.

Potential impacts from upset and accident conditions involving the release of hazardous materials and wastes would also be minimized, because the proposed action would comply with DPH requirements for hazardous materials and waste management, which are described above. This includes preparation of required emergency response plans for facilities subject to HMBP requirements and permitting for hazardous materials storage, USTs, and hazardous waste generation, under the DPH Certificate of Registration Program.

As described in Section 3.7, Hazards and Hazardous Substances, the transportation of hazardous materials is required to comply with federal and state laws and regulations. These regulations identify proper labeling and packaging, transfer, and documentation requirements. State law prescribes requirements for through-transport of hazardous materials on roadways under state control.

There is a comprehensive and ongoing hazardous materials emergency response program in the city. San Francisco has an Emergency Response Plan that was developed to ensure allocation of and coordination of resources in the event of an emergency in the City and County of San Francisco. The Emergency Response Plan describes at a high level what the city's actions would be during an emergency response (DEM 2008). A separate Hazard Mitigation Plan assesses risks posed by natural and human-caused hazards and sets forth a mitigation strategy for reducing the city's risks. The specific departmental responsibilities for responding to hazardous materials incidents in the city are outlined in the "Emergency Support Function #10 Oil and Hazardous Materials Response Annex" to the Emergency Response Plan. The SFFD is the first responder in hazardous materials emergencies for the city and county.

Compliance with city, state, and federal laws, in combination with implementation of the city Emergency Response Plan and Hazard Mitigation Plan, would minimize potential exposure to hazardous materials, via upset and accident conditions, such that impacts would *not be significant.* Therefore, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D, would not cause significant additional impacts associated with exposure to hazardous materials via upset and accident conditions, and therefore impacts associated with hazards materials would *not be significant.*

4.7.3 Alternative 1A: Stadium Plan/No-Bridge Alternative

Alternative 1A would have the same land use development as Alternative 1 except that the Yosemite Slough bridge would not be constructed. Construction and operational impacts for Alternative 1A related to hazards and hazardous substances, as discussed below, would be very similar to Alternative 1, because the types of construction and operational activities are predominantly the same, with the exception of the absence of impacts from the construction and operation of the Yosemite Slough bridge.

4.7.3.1 Construction Impacts

4.7.3.1.1 Factors 1 and 2: Construction Impacts from the Presence of Hazardous Substances

Implementation of Alternative 1A would have very similar impacts from hazards and hazardous substances for construction activities as Alternative 1. As discussed above, CERCLA, DERP, and NCP provisions require that DoN implement remedial actions necessary to adequately protect human health and the environment from risks associated with the actual or potential release of hazardous substances, pollutants, or contaminants into the environment. This requirement of CERCLA applies regardless of future ownership of HPS property.

Implementation of CERCLA ICs will allow the property to be developed for its intended use, subject to land use restrictions designed to prevent exposure to residual levels of hazardous materials. ICs include requirements for monitoring and inspections and reporting to ensure compliance with land use or activity restrictions.

DoN, USEPA, DTSC, RWQCB, and CDPH will, independent of the proposed action and this SEIS, require that before any project site development activity occurs at HPS, appropriate and legally enforceable CERCLA ICs in the form of a recorded covenant, deed provision, easement, or lease term are in effect and applicable. Prior to any transfer or lease of HPS property, DoN must ensure that actual or potential releases of hazardous substances have been addressed that will ensure the protection of human health and the environment following transfer. Such response actions, including ICs, will ensure that the property after transfer will be used in a manner that is adequately protective of the environment and human health as required by CERCLA.

Further, the future property developer or property owner would be required to manage hazardous materials and wastes in accordance with applicable federal, state, and local regulations. In addition, the future developer and/or landowner will be required to obtain all applicable local and state permits, approvals, planning reviews, consultations, and adhere to all applicable building, zoning, environmental, and health and safety laws and regulations before and during the redevelopment of HPS following disposal of the property by the DoN.

For the reasons set forth above, including the completed and ongoing CERCLA remedial actions, appropriate and legally enforceable CERCLA ICs, and the expectation that the future developer or owner of the HPS property would adhere to local, state, and federal laws and regulations during the construction and operation, there would be no hazard to the public or the environment, *no reasonably foreseeable environmental impacts*, and no significant environmental impacts as a result of releases of hazardous substances, pollutants, or contaminants during construction activities at HPS. Therefore, no mitigation is proposed.

4.7.3.2 Operational Impacts

4.7.3.2.1 Factor 1: Routine Use, Storage, Transport, or Disposal of Hazardous Materials

Operational impacts related to routine use, storage, transport, or disposal of hazardous materials for Alternative 1A are similar to Alternative 1. There is an established, comprehensive framework independent of the NEPA process, which is intended to reduce the risks associated with hazardous materials use (and generation of hazardous waste). DPH would continue to conduct periodic inspections to ensure that hazardous materials and wastes are being used and stored properly. For these reasons, hazardous materials uses and waste generation for Alternative 1A operations would not pose a substantial public health or safety hazard to the project vicinity. Impacts from the routine transport, use, or disposal of hazardous materials/waste from operation of Alternative 1A would therefore *not be significant,* and no mitigation is proposed.

Minor changes to the project footprint, associated with operations of Tower Variant D, would not cause modifications to the routine use, storage, transport, or disposal of hazardous materials, and therefore impacts associated with hazardous materials would *not be significant*.

4.7.3.2.2 Factor 2: Exposure to Hazardous Materials via Upset and Accident Conditions

Potential impacts from upset and accident conditions involving the release of hazardous materials and wastes would be minimized, similar to Alternative 1, because Alternative 1A would comply with DPH requirements for hazardous materials and waste management.

Compliance with applicable city, state, and federal laws, in combination with implementation of the city Emergency Response Plan and Hazard Mitigation Plan, would minimize potential exposure to hazardous materials, via upset and accident conditions, such that impacts would *not be significant.* Therefore, no mitigation is proposed.

Minor changes to the project footprint, associated with operations of Tower Variant D, would not cause modifications to potential for exposure to hazardous materials via upset and accident conditions, and therefore impacts associated with hazardous materials would *not be significant*.

4.7.4 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

As shown in Figure 2.5-25, Alternative 2 would replace the football stadium, proposed as part of Alternative 1, with an additional 2,500,000 ft^2 (225,000 m^2) of R&D space. The additional R&D space would result in a larger area of construction, in comparison to Alternative 1. However, construction and operational impacts, related to hazards and hazardous substances, as discussed below, would generally be similar to Alternative 1, because the types of construction activities are predominantly the same. Additionally, operational activities would generally be the same as those under Alternative 1, with the exception of the absence of the football stadium.

Alternative 2 could also be developed with a land use plan that provides for the same development scenario discussed above except that it would also preserve four structures (Buildings 211, 224, 231, and 253), located within the R&D district that are proposed for demolition. Construction impacts related to hazards and hazardous substances would not occur, as no construction or demolition would be completed in association with preservation of these buildings. Operational impacts related to hazards and hazardous substances would be similar to Alternative 1, as discussed below.

4.7.4.1 Construction Impacts

4.7.4.1.1 Factors 1 and 2: Construction Impacts from the Presence of Hazardous Substances

The building footprint of Alternative 2 would be somewhat greater than Alternative 1, as more structures would be constructed. As discussed above, CERCLA, DERP, and NCP provisions require that DoN implement all remedial actions necessary to adequately protect human health and the environment from risks associated with the actual or potential release of hazardous substances, pollutants, or contaminants into the environment. This requirement of CERCLA applies regardless of future ownership of HPS property.

Implementation of ICs will allow the property to be developed for its intended use, subject to land use restrictions designed to prevent exposure to residual levels of hazardous materials. ICs include requirements for monitoring and inspections, and reporting to ensure compliance with land use or activity restrictions.

DoN, USEPA, DTSC, RWQCB, and CDPH will, independent of the proposed action and this SEIS, require that before any project site development activity occurs at HPS, appropriate and legally enforceable CERCLA ICs in the form of a recorded covenant, deed provision, easement, or lease term are in effect and applicable. Prior to any transfer or lease of HPS property, DoN must ensure that actual or potential releases of hazardous substances have been addressed that will ensure the protection of human health and the environment following transfer. Such restrictions will ensure that the property after transfer will be used in a manner that is adequately protective of the environment and human health as required by CERCLA.

Further, the future developer or property owner would be required to manage hazardous materials and wastes in accordance with applicable federal, state, and local regulations. In addition, the future developer and/or landowner would be required to obtain all applicable local and state permits, approvals, planning reviews, consultations, and adhere to all applicable building, zoning, environmental, and health and safety laws and regulations before and during the redevelopment of HPS following disposal of the property by the DoN.

For the reasons set forth above, including the completed and ongoing CERCLA remedial actions, appropriate and legally enforceable CERCLA ICs, and the expectation that the future developer or owner of the HPS property would adhere to local, state, and federal laws and regulations during the construction and operation, there would be no hazard to the public or the environment, *no reasonably foreseeable environmental impacts*, and no significant environmental impacts as a result of releases of hazardous substances, pollutants, or contaminants during construction activities at HPS. Therefore, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause additional exposure to unknown contaminants, and therefore impacts associated with hazardous substances would *not be significant*.

4.7.4.2 Operational Impacts

4.7.4.2.1 Factor 1: Routine Use, Storage, Transport, or Disposal of Hazardous Materials

Alternative 2 would replace the proposed stadium at HPS with R&D uses, resulting in a greater amount of hazardous materials being used compared to a stadium use, depending on the tenants that would occupy Alternative 2 buildings. Alternative 2 would not introduce large-scale manufacturing or processing facilities that would store and use large quantities of hazardous materials that would present a substantial risk to people. However, there would be numerous locations where smaller quantities of hazardous materials would be present, similar to Alternative 1. Products containing hazardous materials used in additional square footage anticipated under Alternative 2 would be incrementally small and would not substantially increase the risk from handling these materials. The potential risks associated with hazardous materials handling and storage would generally be limited to the immediate area where the materials would be located, because this is where exposure would be most likely. Alternative 2 would comply with all applicable laws and regulations that require the implementation of established safety practices, procedures, and reporting requirements pertaining to proper handling, use, storage, transportation, and disposal of hazardous materials. Impacts would *not be significant*, similar to Alternative 1, and no mitigation is proposed.

Minor changes to the project footprint, associated with operations of Tower Variant D or the Building Preservation option, would not cause modifications to the routine use, storage, transport, or disposal of hazardous materials, and therefore impacts associated with hazardous materials would *not be significant*.

4.7.4.2.2 Factor 2: Exposure to Hazardous Materials via Upset and Accident Conditions

Potential impacts from upset and accident conditions involving the release of hazardous materials and wastes would be minimized, similar to Alternative 1, because Alternative 2 would comply with DPH requirements for hazardous materials and waste management, which are described in Section 4.7.2.1.2.

Compliance with applicable city, state, and federal laws, in combination with implementation of the city Emergency Response Plan and Hazard Mitigation Plan, would minimize potential exposure to hazardous materials, via upset and accident conditions, such that impacts would *not be significant*. Therefore, no mitigation is proposed.

Minor changes to the project footprint, associated with operations of Tower Variant D or the Building Preservation option, would not cause modifications to potential for exposure to hazardous materials via upset and accident conditions, and therefore impacts associated with hazardous materials would *not be significant*.

4.7.5 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

Similar to Alternative 2, the Non-Stadium Plan/Housing and R&D Alternative would replace the football stadium, as proposed as part of Alternative 1. Unlike Alternative 2, Alternative 2A would focus on a combination of housing and R&D space, instead of just R&D space. Construction and operational impacts related to hazards and hazardous substances would be similar to Alternative 1, as discussed below, because the type of development and associated construction activities are predominantly the same. Additionally, operational activities are the same as those under Alternative 1, with the exception of the absence of the football stadium.

Alternative 2A could also be developed with a land use plan that provides for the same development scenario discussed above except that it would also preserve four structures (Buildings 211, 224, 231, and 253) located within the R&D district that are proposed for demolition. Construction impacts related to hazards and hazardous substances would not occur, as no construction or demolition would be completed in association with preservation of these buildings. Operational impacts related to hazards and hazardous substances would be similar to Alternative 1, as discussed below.

4.7.5.1 Construction Impacts

4.7.5.1.1 Factors 1 and 2: Construction Impacts from the Presence of Hazardous Substances

The building footprint of Alternative 2A would be somewhat greater than Alternative 1, as more structures would be constructed. Construction activities associated with Alternative 2A are similar to Alternative 1 and the impacts of Alternative 2A would be similar, but slightly greater. Similar to Alternative 1, as discussed above, CERCLA, DERP, and NCP provisions require that DoN implement all remedial actions necessary to adequately protect human health and the environment from risks associated with the actual or potential release of hazardous substances, pollutants, or contaminants into the environment. This requirement of CERCLA applies regardless of future ownership of HPS property.

Implementation of ICs will allow the property to be developed for its intended use, subject to land use restrictions designed to prevent exposure to residual levels of hazardous materials. ICs include requirements for monitoring and inspections, and reporting to ensure compliance with land use or activity restrictions.

DoN, USEPA, DTSC, RWQCB, and CDPH will, independent of the proposed action and this SEIS, require that before any project site development activity occurs at HPS, appropriate and legally enforceable CERCLA ICs in the form of a recorded covenant, deed provision, easement, or lease term are in effect and applicable. Prior to any transfer or lease of HPS property, DoN must ensure that actual or potential releases of hazardous substances have been addressed that will ensure the protection of human health and the environment following transfer. Such restrictions will ensure that the property after transfer will be used in a manner that is adequately protective of the environment and human health as required by CERCLA.

Further, the future developer or property owner would be required to manage hazardous materials and wastes in accordance with applicable federal, state, and local regulations. In addition, the future developer and/or landowner would be required to obtain all applicable local and state permits, approvals, planning reviews, consultations, and adhere to all applicable building, zoning, environmental, and health and safety laws and regulations before and during the redevelopment of HPS following disposal of the property by the DoN.

For the reasons set forth above, including the completed and ongoing CERCLA remedial actions, appropriate and legally enforceable CERCLA ICs, and the expectation that the future developer or owner of the HPS property would adhere to local, state, and federal laws and regulations during the construction and operation, there would be no hazard to the public or the environment, *no reasonably foreseeable environmental impacts*, and no significant environmental impacts as a result of releases of hazardous substances, pollutants, or contaminants during construction activities at HPS. Therefore, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause additional exposure to unknown contaminants, and therefore impacts associated with hazardous substances would *not be significant*.

4.7.5.2 Operational Impacts

4.7.5.2.1 Factor 1: Routine Use, Storage, Transport, or Disposal of Hazardous Materials

Alternative 2A would replace the proposed stadium at HPS with R&D uses, resulting in a greater amount of hazardous materials being used compared to a stadium use, depending on the tenants that would occupy Alternative 2A buildings. Alternative 2A would not introduce large-scale manufacturing or processing facilities that would store and use large quantities of hazardous materials that would present a substantial risk to people. However, there would be numerous locations where smaller quantities of hazardous materials would be present, similar to Alternative 1. Products containing hazardous materials used in additional square footage anticipated under Alternative 2A would be incrementally small and would not substantially increase the risk from handling these materials. The potential risks associated with hazardous materials handling and storage would generally be limited to the immediate area where the materials would be located, because this is where exposure would be most likely. Alternative 2A would comply with all applicable laws and regulations that require the implementation of established safety practices, procedures, and reporting requirements pertaining to proper handling, use, storage, transportation, and disposal of hazardous materials. Impacts would *not be significant*, similar to Alternative 1, and no mitigation is proposed.

Minor changes to the project footprint, associated with operations of Tower Variant D or the Building Preservation option, would not cause modifications to the routine use, storage, transport, or disposal of hazardous materials, and therefore impacts associated with the use of hazardous materials would *not be significant*.

4.7.5.2.2 Factor 2: Exposure to Hazardous Materials via Upset and Accident Conditions

Daily operations under Alternative 2A could result in reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, but it would not pose a human health risk and/or result in an adverse effect on the environment. Potential impacts from upset and accident conditions involving the release of hazardous materials and wastes would be minimized, similar to Alternative 1, because Alternative 2A would comply with DPH requirements for hazardous materials and waste management. With potentially increased routine use of hazardous materials compared to existing conditions, exposure of future occupants, visitors, and employees to hazardous materials could occur by improper handling or use of hazardous materials or hazardous wastes during operation of Alternative 2A. Accidents involving the transportation of hazardous materials to, from, or within the area, although rare, could occur. In general, the types and amounts of hazardous materials would not pose any greater risk of upset or accident compared to other similar development elsewhere in the city. Impacts would *not be significant*, similar to Alternative 1, and no mitigation is proposed.

Minor changes to the project footprint, associated with operations of Tower Variant D or the Building Preservation option, would not cause modifications to potential for exposure to hazardous materials via upset and accident conditions, and therefore impacts associated with hazardous materials would *not be significant*.

4.7.6 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

As shown in Figure 2.5-34, a new stadium would not be constructed under Alternative 3. Instead, housing would be increased by 1,350 residential units at HPS compared to Alternative 1. All other uses at HPS would be constructed at the same locations and at the same intensities. Both construction and operational impacts related to hazards and hazardous substances would be similar to Alternative 1, as discussed below, because the type of development and associated construction activities are predominantly the same. Additionally, with the exception of the football stadium, operational activities would be similar to those associated with Alternative 1.

Alternative 3 could also be developed with a land use plan that provides for the same development scenario discussed above except that it would also preserve four structures (Buildings 211, 224, 231, and 253) located within the R&D district that are proposed for demolition. Construction impacts related to hazards and hazardous substances would not occur, as no construction or demolition would be completed in association with preservation of these buildings. Operational impacts related to hazards and hazardous substances would be similar to Alternative 1, as discussed below.

4.7.6.1 Construction Impacts

4.7.6.1.1 Factors 1 and 2: Construction Impacts from the Presence of Hazardous Substances

The building footprint of Alternative 3 would be slightly greater than Alternative 1, as more structures would be constructed. Construction activities associated with Alternative 3 are similar to Alternative 1 and the impacts of Alternative 3 would be similar, but slightly greater. As discussed above, CERCLA, DERP, and NCP provisions require that DoN implement all remedial actions necessary to adequately protect human health and the environment from risks associated with the actual or potential release of hazardous substances, pollutants, or contaminants into the environment. This requirement of CERCLA applies regardless of future ownership of HPS property.

Implementation of ICs will allow the property to be developed for its intended use, subject to land use restrictions designed to prevent exposure to residual levels of hazardous materials. ICs include requirements for monitoring and inspections, and reporting to ensure compliance with land use or activity restrictions.

DoN, USEPA, DTSC, RWQCB, and CDPH will, independent of the proposed action and this SEIS, require that before any project site development activity occurs at HPS, appropriate and legally enforceable CERCLA ICs in the form of a recorded covenant, deed provision, easement, or lease term are in effect and applicable. Prior to any transfer or lease of HPS property, DoN must ensure that actual or potential releases of hazardous substances have been addressed that will ensure the protection of human health and the environment following transfer. Such restrictions will ensure that the property after transfer will be used in a manner that is adequately protective of the environment and human health as required by CERCLA.

Further, the future developer or property owner would be required to manage hazardous materials and wastes in accordance with applicable federal, state, and local regulations. In addition, the future developer and/or landowner would be required to obtain all applicable local and state permits, approvals, planning reviews, consultations, and adhere to all applicable building, zoning, environmental, and health and safety laws and regulations before and during the redevelopment of HPS following disposal of the property by the DoN.

For the reasons set forth above, including the completed and ongoing CERCLA remedial actions, appropriate and legally enforceable CERCLA ICs, and the expectation that the future developer or owner of the HPS property would adhere to local, state, and federal laws and regulations during the construction and operation, there would be no hazard to the public or the environment, *no reasonably foreseeable environmental impacts*, and no significant environmental impacts as a result of releases of hazardous substances, pollutants, or contaminants during construction activities at HPS. Therefore, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause exposure of construction workers to known contaminants, and therefore impacts associated with hazardous substances would *not be significant*.

4.7.6.2 Operational Impacts

4.7.6.2.1 Factor 1: Routine Use, Storage, Transport, or Disposal of Hazardous Materials

Hazardous materials would routinely be transported to, from, and within the project site, and small amounts of hazardous waste would be removed and transported offsite to licensed disposal facilities. The precise amount of hazardous materials that would be transported to or from the site under Alternative 3 is difficult to predict accurately at the current time due to the pending selection of tenants for the future retail - commercial stores. However, it is understood that these uses would be consistent with those uses analyzed for Alternative 1, in Section 4.7.2.2.1, Factor 1: Routine Use, Storage, Transport, or Disposal of Hazardous Materials. Therefore, impacts would *not be significant*, similar to Alternative 1, and no mitigation is proposed.

Minor changes to the project footprint, associated with operations of Tower Variant D or the Building Preservation option, would not cause modifications to the routine use, storage, transport, or disposal of hazardous materials, and therefore impacts associated with hazardous materials would *not be significant*.

4.7.6.2.2 Factor 2: Exposure to Hazardous Materials via Upset and Accident Conditions

Daily operations under Alternative 3 could result in reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, but it would not pose a human health risk and/or result in an adverse effect on the environment. With potentially increased routine use of hazardous materials compared to existing conditions, exposure of future occupants, visitors, and employees to hazardous materials could occur by improper handling or use of hazardous materials or hazardous wastes during operation of Alternative 3. Accidents involving the transportation of hazardous materials to, from, or within the area, although rare, could occur. In general, the types and amounts of hazardous materials would not pose any greater risk of upset or accident compared to other similar development elsewhere in the city. Impacts would *not be significant*, similar to Alternative 1, and no mitigation is proposed.

Minor changes to the project footprint, associated with operations of Tower Variant D or the Building Preservation option, would not cause modifications to potential for exposure to hazardous materials via upset and accident conditions, and therefore impacts associated with hazardous materials would *not be significant*.

4.7.7 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

Alternative 4 provides a reduced development alternative to Alternative 1. This alternative would reduce the area subject to development and therefore reduce potentially significant impacts, such as encountering previously unknown contamination. In addition, the offsite Yosemite Slough bridge would not be built; therefore, construction and operational related impacts would be reduced.

4.7.7.1 Construction Impacts

4.7.7.1.1 Factors 1 and 2: Construction Impacts from the Presence of Hazardous Substances

Due to the reduced development of Alternative 4, impacts from hazards and hazardous substances would be similar, but slightly reduced from Alternative 1. As discussed above CERCLA, DERP, and NCP provisions require that DoN implement remedial actions necessary to adequately protect human health and the environment from risks associated with the actual or potential release of hazardous substances, pollutants, or contaminants into the environment. This requirement of CERCLA applies regardless of future ownership of HPS property.

Implementation of ICs will allow the property to be developed for its intended use, subject to land use restrictions designed to prevent exposure to residual levels of hazardous materials. ICs include requirements for monitoring and inspections, and reporting to ensure compliance with land use or activity restrictions.

DoN, USEPA, DTSC, RWQCB, and CDPH will, independent of the proposed action and this SEIS, require that before any project site development activity occurs at HPS, appropriate and legally enforceable CERCLA ICs in the form of a recorded covenant, deed provision, easement, or lease term are in effect and applicable. Prior to any transfer or lease of HPS property, DoN must ensure that actual or potential releases of hazardous substances have been addressed that will ensure the protection of human health and the environment following transfer. Such restrictions will ensure that the property after transfer will be used in a manner that is adequately protective of the environment and human health as required by CERCLA.

Further, the future developer or property owner would be required to manage hazardous materials and wastes in accordance with applicable federal, state, and local regulations. In addition, the future developer and/or landowner would be required to obtain all applicable local and state permits, approvals, planning reviews, consultations, and adhere to all applicable building, zoning, environmental, and health and safety laws and regulations before and during the redevelopment of HPS following disposal of the property by the DoN.

For the reasons set forth above, including the completed and ongoing CERCLA remedial actions, appropriate and legally enforceable CERCLA ICs, and the expectation that the future developer or owner of the HPS property would adhere to local, state, and federal laws and regulations during the construction and operation, there would be no hazard to the public or the environment, *no reasonably foreseeable* *environmental impacts*, and no significant environmental impacts as a result of releases of hazardous substances, pollutants, or contaminants during construction activities at HPS. Therefore, no mitigation is proposed.

4.7.7.2 Operational Impacts

4.7.7.2.1 Factor 1: Routine Use, Storage, Transport, or Disposal of Hazardous Materials

Alternative 4 operations would involve routine use, storage, transport, or disposal of hazardous materials. The use of such materials would be reduced compared to Alternative 1, because of a 30 percent reduction in residential and non-residential uses. In addition, the marina would not be constructed, resulting in less hazardous materials usage associated with boat cleaning and maintenance supplies. Alternative 4 operations would not introduce large-scale manufacturing or processing facilities that would store and use large quantities of hazardous materials that would present a substantial risk to people. However, there would be numerous locations where smaller quantities of hazardous materials would be present, similar to Alternative 1. The potential risks associated with hazardous materials handling and storage would generally be limited to the immediate area where the materials would be located, because this is where exposure would be most likely. Alternative 4 operations would comply with all applicable laws and regulations that require the implementation of established safety practices, procedures, and reporting requirements pertaining to proper handling, use, storage, transportation, and disposal of hazardous materials.

Hazardous materials would routinely be transported to, from, and within the project site, and small amounts of hazardous waste would be removed and transported offsite to licensed disposal facilities. The precise amount of hazardous materials that would be transported to or from the site under Alternative 4 is difficult to predict accurately at the current time due to the pending selection of tenants for the future retail - commercial stores. However, it is understood that these uses would be consistent with those uses analyzed for Alternative 1. Therefore, impacts would *not be significant*, similar to Alternative 1, and no mitigation is proposed.

4.7.7.2.2 Factor 2: Exposure to Hazardous Materials via Upset and Accident Conditions

Daily operations under Alternative 4 could result in reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, but it would not pose a human health risk and/or result in an adverse effect on the environment. With potentially increased routine use of hazardous materials compared to existing conditions, exposure of future occupants, visitors, and employees to hazardous materials could occur by improper handling or use of hazardous materials or hazardous wastes during operation of Alternative 4. Accidents involving the transportation of hazardous materials to, from, or within the area, although rare, could occur. Alternative 4 would comply with DPH requirements for hazardous materials and waste management, which are described in Section 4.7.2.2.1, Factor 1: Routine Use, Storage, Transport, or Disposal of Hazardous Materials. In general, the types and amounts of hazardous materials would not pose any greater risk of upset or accident compared to other similar development elsewhere in the city.

Compliance with city, state, and federal laws, in combination with implementation of the city Emergency Response Plan and Hazard Mitigation Plan, would minimize potential exposure to hazardous materials, via upset and accident conditions, such that impacts would *not be significant.* Therefore, no mitigation is proposed.

4.7.8 No Action Alternative

Under the No Action Alternative, HPS would not be disposed of and would remain a closed federal property under caretaker status. Thus, these parcels would not be reused or redeveloped. Environmental cleanup would continue until completion.

4.7.8.1 Construction Impacts

For the No Action Alternative, environmental cleanup would continue within the project site until completion. No new leases would be executed under the No Action Alternative. Existing leases would continue until they expire or are terminated, after which DoN could decide to renew or extend some or all of these leases. Therefore, impacts associated with construction would *not be significant* and no mitigation is proposed.

4.7.8.2 Operational Impacts

4.7.8.2.1 Routine Use, Storage, Transport, or Disposal of Hazardous Materials (Factor 1)

As no operations related to reuse would occur, *no operational impacts* would occur related to the routine use, storage, transport, or disposal of hazardous materials associated with the No Action Alternative. Therefore, no mitigation is proposed.

4.7.9 Mitigation

The proposed action and alternatives would not result in significant impacts to hazards and hazardous substances. No mitigation is proposed.

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4.8 Geology and Soils

4.8.1 Significance Factors

Factors considered in determining whether an alternative would have significant impacts on geology and soils include the extent or degree to which the implementation of an alternative would:

Factor 1 Result in substantial soil erosion or the loss of topsoil;

Factor 2 Be located on a geologic or soil unit that is unstable, or that would become unstable as a result of the proposed action, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse;

Factor 3 Change substantially the topography or any unique geologic or physical features of the project site;

Factor 4 Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map;
- Strong seismic ground shaking;
- Liquefaction;
- Seismically-induced settlement; and/or
- Landslides;

Factor 5 Be located on expansive soil, creating substantial risks to life or property; and/or

Factor 6 Be located on corrosive soil, creating substantial risks to life or property.

4.8.2 Analytic Method

A preliminary geotechnical assessment of the project site has been completed by ENGEO, Inc., as provided in Appendix L of the CP-HPS DEIR (SFRA 2009). The preliminary geotechnical assessment was based on previous site-specific geotechnical and hazardous materials investigations, some of which included subsurface borings, as well as a review of published geologic reports and maps. This geotechnical report provides a summary and compilation of available geotechnical information that has been used as part of the analysis of geologic, seismic, and geotechnical issues for this SEIS.

The proposed alternatives would include residential uses, commercial space, office/research/development space, civic and community uses, open space, a marina, and a new stadium. Proposed structures would be based on design criteria resulting from required evaluation of site-specific geologic and seismic hazards, including potential for fault rupture, ground motions generated by earthquakes (ground shaking), slope instability, liquefaction, lateral spreading, settlement, and loss of soil strength. In addition to evaluating potential long-term or operational impacts from seismic hazards, potentially corrosive soils, or expansive soils, this section also analyzes short-term soils impacts that could occur during construction, such as erosion and local slope instability. For the marina component of the proposed action, the analysis in this section considers the landside improvements (which could include parking, restroom facilities, a classroom to teach sailing, and a harbormaster's office) that could be affected by geologic hazards, as well as shoreline modifications that would be needed to accommodate the gangways and extension of utility infrastructure.

The analysis included a review of regional and local geologic maps and reports, as well as project site-specific geologic and geotechnical reports, to identify geologic conditions and geologic hazards that, because of their proximity, could be directly or indirectly affected by the proposed action or affect the proposed action itself. The overall geotechnical and soil conditions across the project site are similar. To determine potential effects of the proposed action that relate to geologic hazards during construction and operation, this section analyzes the project site with respect to identified geological hazards, such as landslides, unstable slopes, liquefaction hazards, and active faults.

4.8.3 Alternative 1: Stadium Plan Alternative

4.8.3.1 Construction Impacts

4.8.3.1.1 Factor 1: Soil Erosion

Due to the heterogeneous nature of the artificial fill that covers most of the project site, the erosion hazard rating for onsite soils ranges from slight to severe. Construction activities, such as grading and excavation, would remove stabilizing vegetation and pavement, exposing areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff and more concentrated runoff could result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in substantial soil loss. However, requirements to control surface soil erosion during and after construction would be implemented through the requirements of a standard Storm Water Pollution Prevention Plan (SWPPP), as described in Section 4.9, Water Resources. Such a plan would prevent adverse effects on the soil, such as soil loss from wind erosion and stormwater runoff, resulting in *no significant* impacts. Therefore, no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D for Alternative 1 would not substantially increase the potential for erosion, and impacts to soil erosion would *not be significant*.

4.8.3.1.2 Factor 2: Settlement from Dewatering Activities

Construction activities would have the potential to temporarily affect groundwater levels, which are present in the artificial fill and the underlying estuarine deposits at depths generally less than 15 ft (4.5 m) below ground surface. Project construction may include dewatering procedures during excavation, construction, and operation of foundations and buried utilities. Dewatering could cause settlement of adjacent soils that could damage the overlying foundations of existing buildings. However, with implementation of environmental controls as described in the Ground Settlement due to Excavations subsection under Section 2.3.2.1.9, Environmental Controls, groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Therefore, *no significant* settlement impacts related to dewatering would occur in association with Alternative 1, and no mitigation is proposed.

Similarly, construction activities for the Yosemite Slough bridge would have the potential to affect groundwater levels. Some minor dewatering may be needed to reduce heads to several feet (approximately one meter) or more below excavation bottoms and to address seepage and the potential for settlement. However, as there are no existing structures adjacent to the location of the proposed bridge, dewatering during construction would not affect foundations of existing structures. Because impacts would *not be significant*, no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D for Alternative 1 would not substantially increase the potential for settlement from dewatering activities, and impacts related to settlement would *not be significant*.

4.8.3.1.3 Factor 3: Unique Geologic Features

The project site is relatively flat to gently sloping, with elevations generally ranging from approximately 0 to 20 ft (0 to 6 m), and consists primarily of artificial fill (Figure 3.8.3-1). There are no unique geologic features, such as prominent hills, exceptional rock outcroppings, or similar features. Alternative 1 would alter surface topography for new development, including about 3 ft (0.9 m) of fill in some areas. The shoreline would be altered with new seawalls or other shoreline protection. However, the proposed action would not substantially change site topography or affect unique geologic features. Therefore, impacts associated with Alternative 1 would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D for Alternative 1 would not substantially change site topography or affect unique geologic features, and impacts related to unique geologic features would *not be significant.*

4.8.3.2 Operational Impacts

4.8.3.2.1 Factor 2: Non-Seismically Induced Settlement

Poorly consolidated artificial fill deposits are present beneath the project site. Slight to severe damage to structures could occur as a result of settlement of poorly compacted fill or consolidation of very soft natural deposits. Much of the proposed open space and parking areas (Figure 2.3-3) are underlain by Young Bay Mud. These areas generally could tolerate consolidation settlement without serious risk because there would be no major structures or utilities to be affected. Gravity utilities can be designed to accommodate a certain amount of planned settlement. However, extensive Young Bay Mud deposits are also predominant in Parcels D and E (Figure 2.3-2). The rate of settlement of the Young Bay Mud from the load of the artificial fill is now very small, but any increase in loads, whether resulting from placement of new fill or the construction of buildings, would initiate a new cycle of consolidation settlement. However, with implementation of environmental controls, as described in the Ground Settlement due to Poorly Consolidated Material subsection under Section 2.3.2.1.9, Environmental Controls, a site-specific geotechnical report would be prepared, and if necessary, remedial measures would be implemented to reduce and/or avoid impacts related to ground settlement associated with poorly consolidated material. Consequently, because *no significant* settlement impacts related to poorly consolidated material would occur in association with Alternative 1, no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D for Alternative 1 would not substantially increase the potential for non-seismically induced settlement, and impacts related to geologic resources would *not be significant.*

4.8.3.2.2 Factor 2: Shoreline Instability

The existing shoreline along the project site consists of rip-rap protected slopes, unprotected embankments fronted by beach, concrete submarine drydocks, pile-supported wharves (some of which are failing), quay-walls, concrete bulkheads, timber decking and piles, and dilapidated piers. Most of the naval structures are in deteriorated condition. In some areas of the shoreline, piers and wharves have deteriorated from lack of maintenance, and near-shore settlement has occurred, resulting in damage to seawall structures. Proposed structures or infrastructure built in proximity to the shoreline could be susceptible to damage as a result of these deteriorating conditions. Structural damage could occur as a result of slope failure, settlement, or wave damage. However, repairs of existing seawall structures would involve replacement of piles and tie-back systems and replacement of eroded fill material behind seawall structures. In some locations, placement of buttress fill (below the water surface) would occur to enhance structural stability of some seawall structures.

At the submarine drydocks in Parcels B and C, the concrete bulkheads would be left in place, but disconnected from the shoreline by demolishing the near-shore sections to prevent public access. Slope stability would be improved by placing rock or sand buttresses along the quay-wall, applying high strength concrete grout to exposed surfaces and/or epoxy mix application to cracks as needed, and installing weep-holes above low tide elevation to relieve the loading from the fill to be placed along the shoreline. At Berths 1 and 2 in Parcel C, new steel sheet pile bulkheads would be constructed behind the existing corroded bulkheads. Reinforced concrete beams, deck slabs, and steel caisson piles would be repaired and the upper 10 to 15 ft (3.0 to 4.5 m) of concrete wall facing, timber cribbing, and bank rock fill would be removed. In other areas, the facing would be sloped back at a 2H:1V (horizontal to vertical gradient) and protected with rock facing to provide a more natural-looking surface without any additional bay fill.

In addition to improvements to shoreline features, and to reduce the potential for a future rise in sea level that could adversely affect the project site, Alternative 1 would include modification of the land surface through grading and importation of fill. These modifications would raise the finish floor elevations by 3.5 ft (1.0 m) above the 100-year base flood elevation, as described in Section 2.3.2, New Reuse Alternatives, and specifically in the Water Resources subsection under Section 2.3.2.1.9, Environmental Controls. These modifications would account for future sea level rise and include an adaptive management strategy that would provide further protection for future sea level rise, thus improving the stability of the shoreline.

Therefore, improvements proposed as part of Alternative 1 would minimize exposure of structures and facilities at the project site to substantial adverse effects caused by shoreline instability, and impacts would be *beneficial*.

Minor changes to the project footprint associated with construction of Tower Variant D for Alternative 1 would have no effect on shoreline stability, and impacts to geologic resources would *not be significant.*

4.8.3.2.3 Factor 4a: Surface Fault Rupture

Fault rupture hazards within the project site are unlikely. Ground rupture occurs most commonly along preexisting faults, which are zones of weakness. Such rupture typically occurs suddenly, as the result of major stress release along the fault plane earthquakes, but it can also occur slowly as fault creep. Where rupture occurs near buildings or other facilities, there is a potential for injury to persons and significant economic loss because of structural damage.

The Hunters Point Shear Zone, which traverses the project site (Figure 3.8.3-1), is considered inactive. No known active faults traverse the project site, making hazards from fault rupture unlikely. Therefore, there would be *no impacts* caused by surface fault rupture, and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D for Alternative 1 would not increase the potential for fault rupture at the site, and there would be *no impacts.*

4.8.3.2.4 Factor 4b: Seismically Induced Ground Shaking

The project site could be exposed to adverse effects associated with seismically induced ground shaking, which is the most widespread effect of earthquakes and would pose a seismic threat to the development at the project site. Active faults capable of producing strong ground shaking are present near the project site. Most notable of these are the San Andreas, San Gregorio, and Hayward faults. The proposed new structures could experience strong ground shaking from an earthquake on any of these faults. However, with implementation of environmental controls, as described in the Seismically Induced Ground Shaking subsection under Section 2.3.2.1.9, Environmental Controls, site-specific design measures would be incorporated so that proposed structures would withstand expected seismic ground accelerations. Consequently, *no significant* seismic impacts related to ground shaking would occur in association with Alternative 1. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D for Alternative 1 would not substantially increase the potential for damage associated with seismically induced ground shaking, and impacts related to seismicity would *not be significant.*

4.8.3.2.5 Factor 4c: Liquefaction

Structures at the project site could be exposed to seismically induced ground failure, including liquefaction hazards (Figure 3.8.3-2). The foundations for proposed structures, vaults, and pipelines would be the components most vulnerable to damage from liquefaction-related phenomena. In addition, localized hazards may occur in open space areas where habitable structures or critical utilities would not be present. The Yosemite Slough bridge area similarly could be exposed to liquefaction hazards, as artificial fill occurs in the lowland areas near the proposed bridge (Figure 3.8.3-1).

Liquefaction-related phenomena could include lateral spreading, ground oscillation, loss of bearing strength, vertical settlement from densification (subsidence), buoyancy effects, sand boils, and flow failures, any of which could cause damage to the proposed structures in the project site. Damage from liquefaction and lateral spreading generally is most severe when liquefaction occurs within 15 to 20 ft (4.5 to 6.0 m) below the ground surface. The Orthents and Urban Land soils in the lowland areas of the project site have a very high potential for liquefaction. In particular, loosely compacted granular soil with uniform grain size and low plasticity below the groundwater table are most susceptible to liquefaction. Because these types of soil deposits generally are limited to isolated pockets and random layers in the overall soil profile, with the exception of the area in the vicinity of the southeast-facing shoreline of Hunters Point Shipyard (HPS) South, the unmitigated risk is considered low to moderate. The liquefaction hazard can be treated using standard engineering practices to protect improvements (SFRA 2009, Appendix L). However, more extensive zones susceptible to liquefaction could be encountered during standard, final design level, geotechnical investigations, as may be the case in the vicinity of the southeast-facing shoreline of HPS South (Figure 2.3-2). Implementation of environmental controls, as described in the Liquefaction Assessment subsection under Section 2.3.2.1.9, Environmental Controls, would reduce or avoid impacts related to seismically induced ground failure, such as liquefaction, lateral spreading, and/or settlement, by applying structural and ground improvement measures to minimize these risks. Implementation of these measures would reduce seismically induced ground failure hazards so that *no significant* impacts would occur in association with Alternative 1. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not substantially increase the potential for damage associated with liquefaction, and impacts related to liquefaction would *not be significant.*

4.8.3.2.6 Factor 4d: Seismically Induced Settlement

Structures at the project site could be exposed to seismically induced settlement. The foundations for proposed structures, vaults, and pipelines would be the components most vulnerable to damage from seismically induced settlement-related phenomena. Seismically induced settlement, which often occurs as a result of liquefaction, could occur in areas underlain by compressible or poorly consolidated sediments. Artificial fill, which is present in the lowland areas of the project site (Figure 3.8.3-1), can be susceptible to mobilization and densification, resulting in earthquake-induced subsidence. Historical shoreline maps show that artificial fill placement extends as far as 3,300 ft (990 m) into the bay. Implementation of environmental controls, as described in the Seismically Induced Ground Shaking subsection under Section 2.3.2.1.9, Environmental Controls, would reduce or avoid impacts related to seismically induced settlement by applying structural and ground improvement measures to minimize these risks. Implementation of these measures would reduce seismically induced soil settlement so that *no significant impacts* would occur in association with Alternative 1. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D for Alternative 1 would not substantially increase the potential for damage associated with seismically induced settlement, and impacts would *not be significant.*

4.8.3.2.7 Factor 4e: Landslides

As shown in Figure 3.8.3-2, the area immediately uphill from the project site is susceptible to landslides, where serpentinite is abundant in the shear zone. Heavy rainfall contributes to this risk when soil becomes saturated. Similarly, seismically induced ground shaking can cause slope failures. However, slopes adjacent to the project site have been predominantly rebuilt as subdrained engineered slopes during ongoing Phase I development. The project site is predominantly flat and generally not subject to landslide hazards. Therefore, there would be *no impacts* associated with Alternative 1, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not increase the potential for landslides to occur, and *no impacts* related to landslides would occur.

4.8.3.2.8 Factor 5: Expansive Soil

Soils at the project site are predominantly Orthents, cut and fill, and Urban Land and Urban Land Orthents, which have various levels of risk for expansion. Expansion and contraction of soils in response to changes in moisture content can cause differential and cyclical movements that can cause damage and/or distress to structures, foundations, and buried utilities, as well as increase required maintenance.

Impacts related to expansive soils would be avoided or substantially reduced for proposed structures and facilities through the implementation of standard engineering and geotechnical practices, which identify and remediate expansive soils. If the presence of expansive soils is identified, appropriate support and protection procedures would be designed and implemented to maintain the stability of soils adjacent to newly graded or re-graded access roads, work areas, and structures during and after construction, and to minimize potential for damage to structures and facilities at the project site. Specifically, implementation of environmental controls, as described in the Expansive and Corrosive Soils subsection under Section 2.3.2.1.9, Environmental Controls, would reduce or avoid impacts related to expansive soils, by applying ground improvement measures to minimize these risks. Implementation of these controls would reduce soil expansion hazards such that *no significant* impacts would occur in association with Alternative 1. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1 would not substantially increase the potential for damage associated with expansive soils, and impacts related to these soils would *not be significant.*

4.8.3.2.9 Factor 6: Corrosive Soils

Soils beneath the project site have a moderate risk of soil corrosivity to concrete and steel. These corrosive soils, including corrosive minerals and corrosive saline groundwater, could cause damage to structures, foundations, and buried utilities, as well as increase required maintenance. Depending on the degree of corrosivity of subsurface soils, concrete and reinforcing steel in concrete structures and bare-metal structures exposed to these soils could deteriorate, eventually leading to structural failure. Impacts to proposed structures and facilities would be avoided through implementation of standard engineering and geotechnical practices, which identify and remediate corrosive soils. If the presence of corrosive soils is identified, appropriate protection procedures would be designed and implemented to minimize potential for damage from corrosive soils to structures and facilities at the project site. Specifically, implementation of environmental controls, as described in the Expansive and Corrosive Soils subsection under Section 2.3.2.1.9, Environmental Controls, would reduce or avoid impacts related to corrosive soils by applying ground improvement measures to minimize these risks. Implementation of these measures would reduce corrosive soil hazards such that *no significant* impacts would occur in association with Alternative 1. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D for Alternative 1 would not substantially increase the potential for damage associated with corrosive soils, and impacts related to these soils would *not be significant.*

4.8.4 Alternative 1A: Stadium Plan/No-Bridge Alternative

Alternative 1A would be the same as Alternative 1 except that Yosemite Slough bridge would not be constructed. Construction and operational impacts related to geology and soils would be the same as Alternative 1, as discussed below, because the type of development and associated construction activities are predominantly the same. Additionally, operational activities are the same as those under Alternative 1, with the exception of the absence of the Yosemite Slough bridge.

4.8.4.1 Construction Impacts

4.8.4.1.1 Factor 1: Soil Erosion

As with Alternative 1, construction activities, such as grading and excavation, could remove stabilizing vegetation and pavement, exposing areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff and more concentrated runoff could result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. Requirements to control surface soil erosion during and after construction would be implemented through the requirements of a standard SWPPP, as described in Section 4.9, Water Resources, such that adverse effects would be avoided or substantially reduced. As a result, *no significant* erosion-related impacts would occur in association with Alternative 1A.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not substantially increase soil erosion; therefore, erosion-related impacts would *not be significant.*

4.8.4.1.2 Factor 2: Settlement from Dewatering Activities

Construction activities would have the potential to affect groundwater levels. However, with implementation of environmental controls, as described in the Ground Settlement due to Excavations subsection under Section 2.3.2.1.9, Environmental Controls, groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Consequently, *no significant* settlement impacts, related to dewatering, would occur in association with Alternative 1A.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not substantially increase construction-related geologic impacts, including change in groundwater levels; therefore, dewatering-related geologic impacts would *not be significant*.

4.8.4.1.3 Factor 3: Tower Unique Geologic Features

Alternative 1A would not substantially change site topography or affect unique geologic features, resulting in *no significant* impacts. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not substantially increase construction-related geologic impacts, including changes in topography or unique geologic features; therefore, construction-related geologic impacts would *not be significant.*

4.8.4.2 Operational Impacts

4.8.4.2.1 Factor 2: Non-Seismically Induced Settlement, Factor 5: Expansive Soil, and Factor 6: Corrosive Soil

As with Alternative 1, proposed structures would be subject to potentially adverse effects associated with non-seismically induced settlement, expansive soils, and corrosive soils. However, with implementation of environmental controls, as described in the Ground Settlement due to Poorly Consolidated Material and Expansive and Corrosive Soils subsections under Section 2.3.2.1.9, Environmental Controls, a site-specific geotechnical report would be prepared, and if necessary, remedial measures would be implemented to reduce and/or avoid impacts related to these geologic hazards. Consequently, *no significant* non-seismically induced settlement, expansive soils, and corrosive soils impacts would occur in association with Alternative 1A.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not substantially increase operations-related geologic impacts, including non-seismically induced settlement, expansive soils, and corrosive soils; therefore, operations-related geologic impacts would *not be significant*.

4.8.4.2.2 Factor 2: Shoreline Instability

The same as Alternative 1, some areas of the shoreline, piers, and wharves have deteriorated from lack of maintenance and near-shore settlement has occurred, resulting in damage to seawall structures. Proposed structures or infrastructure built in proximity to the shoreline could be susceptible to damage as a result of these deteriorating conditions. Structural damage could occur as a result of slope failure, settlement, or wave damage. However, repairs of existing seawall structures would involve replacement of piles and tie-back systems and replacement of eroded fill material behind seawall structures. In some locations, placement of buttress fill (below the water surface) would occur to enhance structural stability of some seawall structures.

In addition to improvements to shoreline features, and to reduce the potential for a future rise in sea level that could adversely affect the project site, Alternative 1A includes modification of the land surface through grading and importation of fill. These modifications would raise the finish floor elevations by 3.5 ft (1.0 m) above the 100-year base flood elevation, as described in Section 2.3.2, New Reuse Alternatives, and specifically in the Water Resources subsection under Section 2.3.2.1.9, Environmental Controls. These modifications would account for future sea level rise and include an adaptive management strategy that would provide further protection for future sea level rise, thus improving the stability of the shoreline. Therefore, improvements proposed as part of Alternative 1A would minimize exposure of structures and facilities at the project site to substantial adverse effects caused by shoreline instability, resulting in *beneficial* impacts.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not substantially increase operations-related geologic impacts, including shoreline stability; therefore, operations-related geologic impacts would *not be significant.*

4.8.4.2.3 Factor 4a: Surface Fault Rupture, Factor 4b: Seismically Induced Ground Shaking, Factor 4c: Liquefaction, and Factor 4d: Seismically Induced Settlement

Fault rupture hazards are unlikely at the project site. Ground rupture occurs most commonly along preexisting faults. No known active faults traverse the project site, making hazards from fault rupture unlikely as a result of implementation of Alternative 1A. Therefore, there would be *no impacts* caused by surface fault rupture.

As with Alternative 1, the potential for adverse effects caused by seismically induced ground shaking and associated ground failure is present at the project site. Seismically induced ground failure could include liquefaction, lateral spreading, and differential settlement. With implementation of environmental controls, as described in the Seismically Induced Ground Shaking and Liquefaction Assessment subsections under Section 2.3.2.1.9, Environmental Controls, site-specific design measures would be incorporated that would allow proposed structures to withstand expected seismic ground accelerations. Consequently, *no significant* seismic impacts would occur in association with Alternative 1A.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not substantially increase seismic impacts; therefore, operations-related seismic impacts would *not be significant.*

4.8.4.2.4 Factor 4e: Landslides

The project site is predominantly flat to gently sloping and generally not subject to landslide hazards. Therefore, the same as Alternative 1, *no impacts* related to landslides would occur in association with Alternative 1A, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not substantially increase slope stability impacts; therefore, operations-related geologic impacts would *not be significant.*

4.8.5 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

Alternative 2 would replace the football stadium, as proposed as part of Alternative 1, with an additional 2.5 million ft^2 (225,000 m^2) of R&D space. Construction and operational impacts related to geology and soils would be the same as Alternative 1, as discussed below, because the type of development and associated construction activities are predominantly the same. Additionally, operational activities are the same as those under Alternative 1, with the exception of the absence of the football stadium.

Alternative 2 could also be developed with a land use plan that provides for the same development scenario discussed above except that it would also preserve four structures (Buildings 211, 224, 231, and 253) located within the R&D district that are proposed for demolition. Construction impacts related to geology and soils would not occur, as no construction or demolition would be completed in association with preservation of these buildings. Operational impacts related to geology and soils would be the same as Alternative 1, as discussed below.

4.8.5.1 Construction Impacts

4.8.5.1.1 Factor 1: Soil Erosion

As with Alternative 1, construction activities throughout the project site, such as grading and excavation, could remove stabilizing vegetation and pavement, exposing areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff and more concentrated runoff could result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. Requirements to control surface soil erosion during and after construction would be implemented through the requirements of a standard SWPPP, as described in Section 4.9, Water Resources, such that adverse effects would be avoided or substantially reduced. As a result, *no significant* erosion-related impacts would occur in association with Alternative 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2, would not substantially increase soil erosion; therefore, erosion-related impacts would *not be significant.*

4.8.5.1.2 Factor 2: Settlement from Dewatering Activities

Construction activities would have the potential to affect groundwater levels. However, with implementation of environmental controls, as described in the Ground Settlement due to Excavation subsection under Section 2.3.2.1.9, Environmental Controls, groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Consequently, *no significant* settlement impacts, related to dewatering, would occur in association with Alternative 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2, would not substantially change groundwater levels; therefore, construction-related geologic impacts would *not be significant.*

4.8.5.1.3 Factor 3: Unique Geologic Features

Alternative 2 would not substantially change site topography or affect unique geologic features, resulting in *no significant* impacts. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2, would not substantially increase changes in topography or unique geologic features; therefore, construction-related geologic impacts would *not be significant.*

4.8.5.2 Operational Impacts

4.8.5.2.1 Factor 2: Non-Seismically Induced Settlement, Factor 5: Expansive Soil, and Factor 6: Corrosive Soil

As with Alternative 1, proposed structures would be subject to potentially adverse effects associated with non-seismically induced settlement, expansive soils, and corrosive soils. However, with implementation of environmental controls, as described in the Ground Settlement due to Poorly Consolidated Material and Expansive and Corrosive Soils subsections under Section 2.3.2.1.9, Environmental Controls, a site-specific geotechnical report would be prepared, and if necessary, remedial measures would be implemented to reduce and/or avoid impacts related to these geologic hazards. Consequently, *no significant* non-seismically induced settlement, expansive soils, and corrosive soils impacts would occur in association with Alternative 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2, would not substantially increase operations-related geologic impacts, including non-seismically induced settlement, expansive soils, and corrosive soils; therefore, operations-related geologic impacts would *not be significant.*

4.8.5.2.2 Factor 2: Shoreline Instability

The same as Alternative 1, some areas of the shoreline, piers, and wharves have deteriorated from lack of maintenance and near-shore settlement has occurred, resulting in damage to seawall structures. Proposed structures or infrastructure built in proximity to the shoreline could be susceptible to damage as a result of these deteriorating conditions. Structural damage could occur as a result of slope failure, settlement, or wave damage. However, repairs of existing seawall structures would involve replacement of piles and tie-back systems and replacement of eroded fill material behind seawall structures. In some locations, placement of buttress fill (below the water surface) would occur to enhance structural stability of some seawall structures.

In addition to improvements to shoreline features, and to reduce the potential for a future rise in sea level that could adversely affect the project site, Alternative 2 includes modification of the land surface through grading and importation of fill. These modifications would raise the finish floor elevations by 3.5 ft (1.0 m) above the 100-year base flood elevation, as described in Section 2.3.2, New Reuse Alternatives, and specifically in the Water Resources subsection under Section 2.3.2.1.9, Environmental Controls. These modifications would account for future sea level rise and include an adaptive management strategy that would provide further protection for future sea level rise, thus improving the stability of the shoreline. Therefore, improvements proposed as part of Alternative 2 would minimize exposure of structures and facilities at the project site to substantial adverse effects caused by shoreline instability, resulting in *beneficial* impacts.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2, would not substantially increase shoreline instability; therefore, operations-related geologic impacts would *not be significant.*

4.8.5.2.3 Factor 4a: Surface Fault Rupture, Factor 4b: Seismically Induced Ground Shaking, Factor 4c: Liquefaction, and Factor 4d: Seismically Induced Settlement

Fault rupture hazards are unlikely at the project site. Ground rupture occurs most commonly along preexisting faults. No known active faults traverse the project site, making hazards from fault rupture unlikely as a result of implementation of Alternative 2. Therefore, there would be *no impacts* caused by surface fault rupture.

As with Alternative 1, the potential for adverse effects caused by seismically induced ground shaking and associated ground failure is present at the project site. Seismically induced ground failure could include liquefaction, lateral spreading, and differential settlement. However, with implementation of environmental controls, as described in the Seismically Induced Ground Shaking and Liquefaction Assessment subsections under Section 2.3.2.1.9, Environmental Controls, site-specific design measures would be incorporated so that proposed structures would withstand expected seismic ground accelerations. Consequently, *no significant* seismic impacts would occur in association with Alternative 2.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2, would not substantially increase seismic impacts; therefore, operations-related seismic impacts would *not be significant.*

4.8.5.2.4 Factor 4e: Landslides

The project site is predominantly flat to gently sloping and generally not subject to landslide hazards. Therefore, the same as Alternative 1, *no impacts* related to landslides would occur in association with Alternative 2, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2, would not substantially increase the potential for landslides; therefore, operations-related slope stability impacts would *not be significant.*

4.8.6 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

The same as Alternative 2, Alternative 2A would replace the football stadium, as proposed as part of Alternative 1. Unlike Alternative 2, this alternative would focus on a combination of housing and R&D space, instead of just R&D space. Construction and operational impacts related to geology and soils would be the same as Alternative 1, as discussed below, because the type of development and associated construction activities are predominantly the same. Additionally, operational activities are the same as those under Alternative 1, with the exception of the absence of the football stadium.

Alternative 2A could also be developed with a land use plan that provides for the same development scenario discussed above except that it would also preserve four structures (Buildings 211, 224, 231, and 253) located within the R&D district that are proposed for demolition. Construction impacts related to geology and soils would not occur, as no construction or demolition would be completed in association with preservation of these buildings. Operational impacts related to geology and soils would be the same as Alternative 1, as discussed below.

4.8.6.1 Construction Impacts

4.8.6.1.1 Factor 1: Soil Erosion

As with Alternative 1, construction activities, such as grading and excavation, could remove stabilizing vegetation and pavement, exposing areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff and more concentrated runoff could result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. Requirements to control surface soil erosion during and after construction would be implemented through the requirements of a standard SWPPP, as described in Section 4.9, Water Resources, such that adverse effects would be avoided or substantially reduced. As a result, *no significant* erosion-related impacts would occur in association with Alternative 2A.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A, would not substantially increase soil erosion; therefore, construction-related geologic impacts would *not be significant.*

4.8.6.1.2 Factor 2: Settlement from Dewatering Activities

Construction activities would have the potential to affect groundwater levels. With implementation of environmental controls, as described in the Ground Settlement due to Excavation subsection under Section 2.3.2.1.9, Environmental Controls, groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Consequently, *no significant* settlement impacts, related to dewatering, would occur in association with Alternative 2A.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A, would not substantially change groundwater levels; therefore, construction-related geologic impacts would *not be significant.*

4.8.6.1.3 Factor 3: Unique Geologic Features

Alternative 2A would not substantially change site topography or affect unique geologic features, resulting in *no significant* impacts. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A, would not substantially increase changes in topography or unique geologic features; therefore, construction-related geologic impacts would *not be significant.*

4.8.6.2 Operational Impacts

4.8.6.2.1 Factor 2: Non-Seismically Induced Settlement, Factor 5: Expansive Soil, and Factor 6: Corrosive Soil

As with Alternative 1, proposed structures would be subject to potentially adverse effects associated with non-seismically induced settlement, expansive soils, and corrosive soils. However, with implementation of environmental controls, as described in the Ground Settlement due to Poorly Consolidated Material and Expansive and Corrosive Soils subsections under Section 2.3.2.1.9, Environmental Controls, a site-specific geotechnical report would be prepared, and if necessary, remedial measures would be implemented to reduce and/or avoid impacts related to these geologic hazards. Consequently, *no significant* non-seismically induced settlement, expansive soils, and corrosive soils impacts would occur in association with Alternative 2A.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A, would not substantially increase operations-related geologic impacts, including non-seismically induced settlement, expansive soils, and corrosive soils; therefore, operations-related geologic impacts would *not be significant.*

4.8.6.2.2 Factor 2: Shoreline Instability

The same as Alternative 1, some areas of the shoreline, piers, and wharves have deteriorated from lack of maintenance and near-shore settlement has occurred, resulting in damage to seawall structures. Proposed structures or infrastructure built in proximity to the shoreline could be susceptible to damage as a result of these deteriorating conditions. Structural damage could occur as a result of slope failure, settlement, or wave damage. However, repairs of existing seawall structures would involve replacement of piles and tie-back systems and replacement of eroded fill material behind seawall structures. In some locations, placement of buttress fill (below the water surface) would occur to enhance structural stability of some seawall structures.

In addition to improvements to shoreline features, and to reduce the potential for a future rise in sea level that could adversely affect the project site, Alternative 2A includes modification of the land surface through grading and importation of fill. These modifications would raise the finish floor elevations by 3.5 ft (1.0 m) above the 100-year base flood elevation, as described in Section 2.3.2, New Reuse Alternatives, and specifically in the Water Resources subsection under Section 2.3.2.1.9, Environmental Controls. These modifications would account for future sea level rise and include an adaptive management strategy that would provide further protection for future sea level rise, thus improving the stability of the shoreline. Therefore, improvements proposed as part of Alternative 2A would minimize exposure of structures and facilities at the project site to substantial adverse effects caused by shoreline instability, resulting in *beneficial* impacts.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A, would not substantially increase shoreline instability; therefore, operations-related geologic impacts would *not be significant.*

4.8.6.2.3 Factor 4a: Surface Fault Rupture, Factor 4b: Seismically Induced Ground Shaking, Factor 4c: Liquefaction, and Factor 4d: Seismically Induced Settlement

Fault rupture hazards are unlikely at the project site. Ground rupture occurs most commonly along preexisting faults. No known active faults traverse the project site, making hazards from fault rupture unlikely as a result of implementation of Alternative 2A. Therefore, there would be *no impacts* caused by surface fault rupture.

As with Alternative 1, the potential for adverse effects caused by seismically induced ground shaking and associated ground failure is present at the project site. Seismically induced ground failure could include liquefaction, lateral spreading, and differential settlement. However, with implementation of environmental controls, as described in the Seismically Induced Ground Shaking and Liquefaction Assessment subsections under Section 2.3.2.1.9, Environmental Controls, site-specific design measures would be incorporated so that proposed structures would withstand expected seismic ground accelerations. Consequently, *no significant* seismic impacts would occur in association with Alternative 2A.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A, would not substantially increase seismic impacts; therefore, operations-related seismic impacts would *not be significant.*

4.8.6.2.4 Factor 4e: Landslides

The project site is predominantly flat to gently sloping and generally not subject to landslide hazards. Therefore, same as Alternative 1, *no impacts* related to landslides would occur in association with Alternative 2A, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 2A, would not substantially increase the potential for landslides; therefore, operations-related slope stability impacts would *not be significant.*

4.8.7 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

Alternative 3 would replace the football stadium, as proposed as part of Alternative 1, with increased housing. All other uses at HPS would be constructed at the same locations and at the same intensities proposed for Alternative 1. Both construction and operational impacts to geology and soils would be the same as Alternative 1, as discussed below, because the type of development and associated construction activities are predominantly the same. Additionally, with the exception of the football stadium, operational activities would be the same as those proposed under Alternative 1.

Alternative 3 could also be developed with a land use plan that provides for the same development scenario discussed above, except that it would also preserve four structures (Buildings 211, 224, 231, and 253), located within the R&D district that are proposed for demolition. Construction impacts related to geology and soils would not occur, as no construction or demolition would be completed in association with preservation of these buildings. Operational impacts related to geology and soils would be the same as Alternative 1, as discussed below.

4.8.7.1 Construction Impacts

4.8.7.1.1 Factor 1: Soil Erosion

As with Alternative 1, construction activities, such as grading and excavation, could remove stabilizing vegetation and pavement, exposing areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff and more concentrated runoff could result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. Requirements to control surface soil erosion during and after construction would be implemented through the requirements of a standard SWPPP, as described in Section 4.9, Water Resources, such that adverse effects would be avoided or substantially reduced. As a result, *no significant* erosion-related impacts would occur in association with Alternative 3.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3, would not substantially increase soil erosion; therefore, construction-related geologic impacts would *not be significant.*

4.8.7.1.2 Factor 2: Settlement from Dewatering Activities

Construction activities would have the potential to affect groundwater levels. However, with implementation of environmental controls, as described in the Ground Settlement due to Excavation subsection under Section 2.3.2.1.9, Environmental Controls, groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Consequently, *no significant* settlement impacts related to dewatering would occur in association with Alternative 3.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3, would not substantially change groundwater levels; therefore, construction-related geologic impacts would *not be significant.*

4.8.7.1.3 Factor 3: Unique Geologic Features

Alternative 3 would not substantially change site topography or affect unique geologic features, resulting in *no significant* impacts. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3, would not substantially increase changes in topography or unique geologic features; therefore, construction-related geologic impacts would *not be significant.*

4.8.7.2 Operational Impacts

4.8.7.2.1 Factor 2: Non-Seismically Induced Settlement, Factor 5: Expansive Soil, and Factor 6: Corrosive Soil

As with Alternative 1, proposed structures would be subject to potentially adverse affects associated with non-seismically induced settlement, expansive soils, and corrosive soils. However, with implementation of environmental controls, as described in the Ground Settlement due to Poorly Consolidated Material and Expansive and Corrosive Soils subsections under Section 2.3.2.1.9, Environmental Controls, a site-specific geotechnical report would be prepared, and if necessary, remedial measures would be implemented to reduce and/or avoid impacts related to these geologic hazards. Consequently, *no significant* non-seismically induced settlement, expansive soils, and corrosive soils impacts would occur in association with Alternative 3.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3, would not substantially increase operations-related geologic impacts, including non-seismically induced settlement, expansive soils, and corrosive soils; therefore, operations-related geologic impacts would *not be significant.*

4.8.7.2.2 Factor 2: Shoreline Instability

Some areas of the shoreline, piers, and wharves have deteriorated from lack of maintenance and near-shore settlement has occurred, resulting in damage to seawall structures. Proposed structures or infrastructure built in proximity to the shoreline could be susceptible to damage as a result of these deteriorating conditions. Structural damage could occur as a result of slope failure, settlement, or wave damage. However, repairs of existing seawall structures would involve replacement of piles and tie-back systems and replacement of eroded fill material behind seawall structures. In some locations, placement of buttress fill (below the water surface) would occur to enhance structural stability of some seawall structures.

In addition to improvements to shoreline features, and to reduce the potential for a future rise in sea level that could adversely affect the project site, Alternative 3 includes modification of the land surface through grading and importation of fill. These modifications would raise the finish floor elevations by 3.5 ft (1.0 m) above the 100-year base flood elevation, as described in Section 2.3.2, New Reuse Alternatives, and specifically in the Water Resources subsection under Section 2.3.2.1.9, Environmental Controls. These modifications would account for future sea level rise and include an adaptive management strategy that would provide further protection for future sea level rise, thus improving the stability of the shoreline. Therefore, improvements proposed as part of Alternative 3 would minimize exposure of structures and facilities at the project site to substantial adverse effects caused by shoreline instability, resulting in *beneficial* impacts.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3, would not substantially increase shoreline instability; therefore, operations-related geologic impacts would *not be significant.*

4.8.7.2.3 Factor 4a: Surface Fault Rupture, Factor 4b: Seismically Induced Ground Shaking, Factor 4c: Liquefaction, and Factor 4d: Seismically Induced Settlement

Fault rupture hazards are unlikely at the project site. Ground rupture occurs most commonly along preexisting faults. No known active faults traverse the project site, making hazards from fault rupture unlikely as a result of implementation of Alternative 3. Therefore, there would be *no impacts* caused by surface fault rupture.

As with Alternative 1, the potential for adverse effects caused by seismically induced ground shaking and associated ground failure is present at the project site. Seismically induced ground failure could include liquefaction, lateral spreading, and differential settlement. However, with implementation of environmental controls, as described in the Seismically Induced Ground Shaking and Liquefaction Assessment subsections under Section 2.3.2.1.9, Environmental Controls, site-specific design measures would be incorporated so that proposed structures would withstand expected seismic ground accelerations. Consequently, *no significant* seismic impacts would occur in association with Alternative 3.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3, would not substantially increase seismic impacts; therefore, operations-related seismic impacts would *not be significant.*

4.8.7.2.4 Factor 4e: Landslides

The project site is predominantly flat to gently sloping and generally not subject to landslide hazards. Therefore, the same as Alternative 1, no impacts related to landslides would occur in association with Alternative 3 and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D and the Building Preservation option for Alternative 3, would not substantially increase the potential for landslides; therefore, operations-related slope stability impacts would *not be significant.*

4.8.8 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

Alternative 4 would provide a reduced development alternative to Alternative 1. This alternative would reduce the area subject to development. In addition, the offsite Yosemite Slough bridge would not be built; therefore, construction impacts and operational impacts would be reduced.

4.8.8.1 Construction Impacts

4.8.8.1.1 Factor 1: Soil Erosion

As with Alternative 1, construction activities, such as grading and excavation, could remove stabilizing vegetation and pavement, exposing areas of loose soil that, if not properly stabilized, could be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes could undergo substantial erosion through dispersed sheet flow runoff and more concentrated runoff could result in the formation of erosional channels and larger gullies, each compromising the integrity of the slope and resulting in significant soil loss. Requirements to control surface soil erosion during and after construction would be implemented through a standard SWPPP, as described in Section

4.9, Water Resources, such that adverse effects would be avoided or substantially reduced. As a result, *no significant* erosion-related impacts would occur in association with Alternative 4.

4.8.8.1.2 Factor 2: Settlement from Dewatering Activities

Construction activities would have the potential to affect groundwater levels. However, with implementation of environmental controls, as described in the Ground Settlement due to Excavation subsection under Section 2.3.2.1.9, Environmental Controls, groundwater levels in the area would not be lowered such that unacceptable settlement at adjacent or nearby properties would occur. Consequently, *no significant* settlement impacts related to dewatering would occur in association with Alternative 4.

4.8.8.1.3 Factor 3: Unique Geologic Features

Alternative 4 would not substantially change site topography or affect unique geologic features, resulting in *no significant* impacts. Because impacts would not be significant, no mitigation is proposed.

4.8.8.2 Operational Impacts

4.8.8.2.1 Factor 2: Non-Seismically Induced Settlement, Factor 5: Expansive Soil, and Factor 6: Corrosive Soil

As with Alternative 1, proposed structures would be subject to potentially adverse affects associated with non-seismically induced settlement, expansive soils, and corrosive soils. However, with implementation of environmental controls, as described in the Ground Settlement due to Poorly Consolidated Material and Expansive and Corrosive Soils subsections under Section 2.3.2.1.9, Environmental Controls, a site-specific geotechnical report would be prepared, and if necessary, remedial measures would be implemented to reduce and/or avoid impacts related to these geologic hazards. Consequently, *no significant* non-seismically induced settlement, expansive soils, and corrosive soils impacts would occur in association with Alternative 4.

4.8.8.2.2 Factor 2: Shoreline Instability

The same as Alternative 1, some areas of the shoreline, piers, and wharves have deteriorated from lack of maintenance and near-shore settlement has occurred, resulting in damage to seawall structures. Proposed structures or infrastructure built in proximity to the shoreline could be susceptible to damage as a result of these deteriorating conditions. Structural damage could occur as a result of slope failure, settlement, or wave damage. However, repairs of existing seawall structures would involve replacement of piles and tie-back systems and replacement of eroded fill material behind seawall structures. In some locations, placement of buttress fill (below the water surface) would occur to enhance structural stability of some seawall structures.

In addition to improvements to shoreline features, and to reduce the potential for a future rise in sea level that could adversely affect the project site, Alternative 4 includes modification of the land surface through grading and importation of fill. These modifications would raise the finish floor elevations by 3.5 ft (1.0 m) above the 100-year base flood elevation, as described in Section 2.3.2, New Reuse Alternatives, and specifically in the Water Resources subsection under Section 2.3.2.1.9, Environmental Controls. These modifications would account for future sea level rise and include an adaptive management strategy that would provide further protection for future sea level rise, thus improving the stability of the shoreline. Therefore, improvements proposed as part of Alternative 4 would minimize exposure of structures and facilities at the project site to substantial adverse effects caused by shoreline instability, resulting in *beneficial* impacts.

4.8.8.2.3 Factor 4a: Surface Fault Rupture, Factor 4b: Seismically Induced Ground Shaking, Factor 4c: Liquefaction, and Factor 4d: Seismically Induced Settlement

Fault rupture hazards are unlikely at the project site. Ground rupture occurs most commonly along preexisting faults. No known active faults traverse the project site, making hazards from fault rupture unlikely as a result of implementation of Alternative 4. Therefore, there would be *no impacts* caused by surface fault rupture.

As with Alternative 1, the potential for adverse effects caused by seismically induced ground shaking and associated ground failure is present at the project site. Seismically induced ground failure could include liquefaction, lateral spreading, and differential settlement. However, with implementation of environmental controls, as described in the Seismically Induced Ground Shaking and Liquefaction Assessment subsections under Section 2.3.2.1.9, Environmental Controls, site-specific design measures would be incorporated so that proposed structures would withstand expected seismic ground accelerations. Consequently, *no significant* seismic impacts would occur in association with Alternative 4.

4.8.8.2.4 Factor 4e: Landslides

The project site is predominantly flat to gently sloping and generally not subject to landslide hazards. Therefore, the same as Alternative 1, *no impacts* related to landslides would occur in association with Alternative 4 and no mitigation is proposed.

4.8.9 No Action Alternative

Under the No Action Alternative, the portion of HPS would not be disposed of and would remain a closed federal property under caretaker status. Thus, these parcels would not be reused or redeveloped. As no ground disturbance, demolition, or construction would occur, there would be *no impacts* to geology and soils.

4.8.10 Mitigation

The proposed action and alternatives would not result in significant impacts to geology and soils. No mitigation is proposed.

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4.9 Water Resources

4.9.1 Methodology

4.9.1.1 Significance Factors

Factors considered in determining whether an alternative would have significant impacts on water resources include the extent or degree to which the implementation of an alternative would:

Factor 1 Violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality below levels established by regulatory agencies;

Factor 2 Adversely affect drainage patterns to the extent that the physical, chemical, or biological character of nearby bodies of surface waters would be substantially altered;

Factor 3 Substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level; and/or

Factor 4 Increase risks to human health and safety or of economic damage by siting incompatible land uses and facilities within areas susceptible to flooding or inundation.

4.9.1.2 Analytical Method

Water resources within the HPS watershed and receiving waters could be affected by project construction or operations that result from changes to the amount of impervious surfaces, runoff flow patterns, or potentials for flooding, or the introduction of new pollutants and migration of existing pollutants. Factors for evaluating effects on surface and groundwater quality are based on existing water quality standards in the Basin Plan, including TMDLs, potentials to cause or contribute to water quality degradation, and risks of flood-related damages.

Construction and operation of the proposed action and alternatives would be subject to numerous federal and state regulations, and would require a number of permits, as discussed in Section 3.9, Water Resources. Impact analyses assume that all activities comply with applicable regulations and permit conditions. Additionally, historic uses at HPS by both DoN and its tenants resulted in a number of hazardous substances release sites that are presently undergoing remediation by DoN under federal law and under the oversight of federal and state environmental agencies. As discussed in Section 3.7, Hazards and Hazardous Substances, DoN must ensure that remediation of property on HPS is consistent with the appropriate regulations. Where hazardous substances remain on the property at the time of transfer, DoN would implement Institutional Controls (ICs). The following analyses of impacts to water resources assume that remediation has been completed and ICs have been implemented.

4.9.1.2.1 Stormwater Flows

Installation of new impervious surfaces and changes in site drainage patterns could increase the rate and amount of stormwater runoff from the project site. Assessments of the change in impervious cover used: 1) available geographic information systems (GIS) data of existing land uses to estimate the present extent of coverage by structures, roads, parking lots, and other impervious surfaces; and 2) site plans for the project to determine the extent of impervious cover for the proposed future uses. Potential project operational effects on the amount of stormwater runoff were estimated based on changes in surface runoff characteristics as affected by the amount of impervious surfaces, the time it would take runoff to travel to the storm drain system or directly to the bay, and precipitation records. At this time, runoff volumes and rates can only be estimated because the precise mix, size, and routing of stormwater BMPs that would be used to collect, treat, infiltrate, and discharge runoff would not be completed until final project design stages. The types of BMPs, their locations, and sizes could all affect stormwater flow by detention and retention.[1] Therefore, the runoff estimates do not include BMPs and, consequently, represent worst case conditions.

4.9.1.2.2 Stormwater Quality and Pollutant Loadings

Construction and development of new land uses could result in the introduction of various pollutants into stormwater runoff. Consequently, this assessment of impacts to water resources estimates the potential for new land uses to introduce pollutants and increase loadings. The potential for effects on water resources are estimated based on the proposed changes in land use and site runoff characteristics and literature values for pollutant concentrations in runoff from land use categories for some of the identified constituents of concern (COCs). Annual pollutant loads for chemical constituents are estimated as a product of annual runoff volume and typical values for pollutant concentrations in stormwater runoff as a function of land use. Estimates of pollutant loading represent the amount (i.e., total pounds) of a pollutant that would enter the receiving water during an average year. Not all COCs are included in the pollutant load analysis because sufficient data are not available.

4.9.1.2.3 Surface Water Constituents of Concern

Surface water COCs for the project include those pollutants likely to be present in stormwater runoff from the project site and those for which the receiving water(s) (bay) are listed as impaired or for which there is an existing TMDL. COCs also include pollutants of concern, such as suspended solids (sediments), litter, heavy metals, and petroleum hydrocarbons that would be targeted by the Stormwater Management Plan. The Stormwater Management Plan would be prepared in compliance with the Municipal Stormwater General Permit. Table 4.9.1-1 lists the classes of potential pollutants in stormwater runoff from the project. The COCs include pathogens, metals (including mercury), nutrients, sediment, trash and debris, oxygen-demanding substances, oil and grease, pesticides, and trace organic compounds (including PCBs), as described below.

- **Bacteria and Viruses (Pathogens).** Bacteria and viruses are common contaminants in stormwater. Sources may include animal excrement and sanitary sewer overflow. High levels of indicator bacteria in stormwater have resulted in closures of water bodies to contact recreation such as swimming. Pathogens are not identified on the 303(d) list as impairing the water quality of the Lower Bay.
- **Metals**. Emissions from automobiles and many artificial surfaces of the urban environment (e.g., those covered with galvanized metal, paint, or preserved wood) contain metals that enter stormwater as the surfaces corrode, flake, dissolve, decay, or leach. Metals are often associated with sediments in stormwater. Metals are of concern because they can be toxic to aquatic organisms and bioaccumulate (accumulate to toxic levels in aquatic animals such as fish, which can be a health hazard if consumed by other aquatic organisms or people). Mercury is on the 303(d) list as impairing the water quality of the Lower Bay, and is the subject of a TMDL. Sources of mercury in urban runoff include mercury-containing instruments, switches and thermostats, and fluorescent lighting (McKee and Mangarella 2009).
- **Nutrients.** Nutrients, including nitrogen and phosphorous, are used for fertilizing landscapes, and often occur in stormwater due to wet and dry weather runoff. Discharges of nutrients into

[1] Detention refers to slowing down, temporary storing, and releasing stormwater runoff at a controlled rate. Retention refers to capturing stormwater runoff and preventing discharge from the detention device. Retention can be accomplished by storage or infiltration.

water bodies can cause excessive aquatic algae and plant growth (i.e., eutrophication), resulting in water body impairment. Nutrients are not on the 303(d) list as impairing the water quality of the Lower Bay.

- **Sediment.** Sediment is a common component of stormwater, and can be a pollutant because it can be detrimental to aquatic life by interfering with photosynthesis, respiration, growth, reproduction, and oxygen exchange in water bodies. Erosion and transport of sediment can also transport other pollutants, such as nutrients, metals, pesticides, and petroleum hydrocarbons, which are attached to the sediment particles. Sediments are not on the 303(d) list as impairing the water quality of the Lower Bay.
- **Trash and Debris.** Trash (e.g., paper, plastic, polystyrene packing foam, and aluminum materials) and debris (biodegradable organic matter such as leaves, grass cuttings, and food waste) are general waste products. The occurrence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Trash and debris are not on the 303(d) list as impairing the water quality of the Lower Bay.
- **Oxygen-Demanding Substances.** Oxygen-demanding substances include biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Food and pet wastes are examples of oxygen-demanding substances. Excess organic matter can create a high oxygen demand, causing degradation of water quality. In areas where stagnant water exists, the presence of excess organic matter can promote septic conditions, resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds, such as hydrogen sulfide, and cause impairment, such as fish kills. Oxygen-demanding substances are not on the 303(d) list as impairing the water quality of the Lower Bay.
- **Oil and Grease.** Oil and grease consist of a wide array of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. Sources of oil and grease include leakage, spills, cleaning and sloughing associated with vehicle and equipment engines and suspensions, leaks and breaks in hydraulic systems, improper disposal of cooking oils/fats from restaurants, and improper waste oil disposal. Oil and grease are not on the 303(d) list as impairing water quality of the Lower Bay.
- **Pesticides.** Pesticides (including herbicides, fungicides, rodenticides, and insecticides) can occur at toxic levels in stormwater, even when pesticides have been applied in accordance with label instructions. Pyrethroids, an emerging class of pesticide that is a primary replacement for pesticides (e.g., diazinon and chlorpyrifos) recently phased out from urban use by USEPA, have been demonstrated to be toxic to organisms in the shallow sediments of California's surface water bodies. The likely sources of the pyrethroids are pest control applications around buildings and, to a lesser extent, applications on lawns and gardens. Legacy pesticides, such as chlordane, dieldrin, and DDT, are on the 303(d) list as impairing water quality of the Lower Bay.
- **Organic Compounds.** Trace organic compounds may occur in stormwater at concentrations that are directly toxic to aquatic organisms. Man-made organic compounds (e.g., adhesives, cleaners, sealants, solvents) are widely applied, may be improperly stored and disposed, and may come into contact with stormwater. In addition, illegal and deliberate dumping of these chemicals into storm drains and inlets can degrade water quality. PCBs, dioxins, and furans are on the 303(d) list as impairing water quality of the Lower Bay. PCBs are specific pollutants of concern at the project site because of the pending TMDL. PCBs were manufactured in the United States between 1929 and 1977 for a variety of uses, until USEPA banned the manufacture and distribution of materials containing PCBs in 1984 (Davis *et al*. 2007; McKee and Mangarella 2009). PCB contamination often originates in older sites and materials, such as building caulk (SFRA 2009). However, PCBs are still used to some extent (e.g., in transformers), and there is a continuing potential for future PCB releases into the environment (Clean Estuary Project 2006).

PCBs in sediments from contaminated areas that come into contact with urban runoff are subject to transport and subsequent release to receiving waters.

Table 4.9.1-1. Pollutants Likely to Be Present in Stormwater Runoff from Project Land Uses

Priority Project Categories	***General Pollutant Categories***								
	Pathogens	*Metals*	*Nutrients*	*Pesticides*	*Organic Compounds*	*Sediments*	*Trash & Debris*	*Oxygen-Demanding Substances*	*Oil & Grease*
Residential Development	X		X	X		X	X	P[a]	P[b]
Commercial/ Industrial Development	P[c]		P[a]	P[e]	P[b]	P[a]	X	P[e]	X
Parking Lots		X	P[a]	P[b]		P[a]	X	P[e]	X
Streets		X	P[a]		X[d]	X	X	P[e]	X

Notes:
X = Expected pollutant.
P = Potential pollutant; a blank cell indicates the pollutant is neither an expected nor a potential pollutant.
a. Potential pollutant if landscaping exists on site.
b. Potential pollutant if the site includes uncovered parking areas.
c. Potential pollutant if land use involves food or animal waste products.
d. Including petroleum hydrocarbons.
e. Including solvents.
Source: California Stormwater Quality Association 2003.

4.9.1.2.4 Groundwater Constituents of Concern

COCs for groundwater quality are those chemicals that could rapidly reach the groundwater aquifer via infiltration of stormwater runoff, as well as those constituents that are elevated in local groundwater. Constituents in stormwater runoff that could infiltrate into groundwater are mobile contaminants that would not be filtered or bound by soils above the groundwater table. These constituents include total dissolved solids (TDS), chloride, and nitrate, and they are described below.

- **Total Dissolved Solids.** TDS are commonly referred to as "salts," although metals and other dissolved solids can contribute to TDS concentrations. The source of salts (including nutrients) are the water-soluble inorganic and organic constituents in imported water, soil materials/minerals, animal wastes, fertilizers and other soil amendments, and industrial wastes (SWRCB 2009b). Water with a TDS concentration above 500 mg/L is not recommended for use as drinking water (USEPA secondary drinking water guidelines), and water with TDS concentrations above 1,500 to 2,600 mg/L generally is considered problematic for irrigation of crops with low or medium salt tolerance (Hartner 2003). A high TDS concentration also indicates that groundwater may contain elevated levels of ions, such as an elevated level of nitrate, arsenic, aluminum, copper, lead, and others, that are above the Primary or Secondary Drinking Water Standards (Wilkes University 2009);
- **Chloride.** Sources of chloride could include seawater intrusion, thermal water, and dissolved minerals from marine and volcanic rocks. High chloride concentrations can make water unusable for drinking and can also be toxic to plants (Planert and Williams 2009);
- **Nitrate.** The major sources of nitrates in urban groundwater are mostly related to sewage infiltration, water supply leakage, contaminated land, and highway and urban runoff (Wakida 2008). High nitrate concentrations can cause methemoglobinemia (a blood disease) in infants (Planert and Williams 2009).

4.9.1.2.5 Flood Hazards

Criteria for evaluating flooding hazards are based on SFPUC stormwater drainage system design criteria and the proposed 100-year flood zones as established by FEMA and Interim Floodplain Maps. Although a BFE has not been formally adopted for the project site, a BFE was estimated by Moffatt and Nichol (2009a) for this analysis. In addition to the potential for the project to increase runoff and cause or contribute to onsite or offsite flooding hazards, the analysis also considers the potential for flooding hazards associated with sea level rise given the proximity of the project site to the bay.

4.9.2 Alternative 1: Stadium Plan Alternative

4.9.2.1 Construction Impacts

4.9.2.1.1 Factor 1: Violate Water Quality Standards

Construction activities such as demolition of existing facilities, clearing and grading of development areas (including excavation, trenching, movement of soil, and the importation of fill soils), and the subsequent construction of new facilities and associated infrastructure would expose soils to rainfall and runoff, construction vehicle traffic, and wind, which could result in the erosion of soils and the mobilization and deposition of dust from disturbed development areas. Construction activities could also result in the incidental release of construction materials or the accidental spill of substances commonly used in construction (e.g., paints, solvents, petroleum products, equipment leakage, and others). Incidental releases or accidental spills could result in the introduction of those substances into areas susceptible to stormwater runoff, with subsequent discharge to the separate sewer system or directly to the bay.

Discharges of runoff, incidental or accidental releases of construction materials or products into the storm drain system or directly to receiving waters within or adjacent to the project site, or exposures of surface water to contaminated soils could impair water quality. Because HPS drains to a separate storm sewer system, construction runoff would not be treated in the combined sewer system; consequently, there is a potential for pollutants in stormwater runoff to discharge to the bay and affect water quality.

The Construction General Permit would require effluent and receiving water monitoring to demonstrate compliance with permit requirements, and the corrective action that must be taken if these limitations are exceeded or visual observations indicate the presence of pollutants. The Construction General Permit would also require that the future developer or owner of the property file Permit Registration Documents prior to beginning construction activities. These documents would include an SWPPP that specifies minimum BMP requirements and measures to ensure that all pollutants and their sources are controlled; non-stormwater discharges are identified and either eliminated, controlled, or treated; site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges; and BMPs installed to reduce or eliminate pollutants after construction are completed and maintained.

While the Construction General Permit would specify required BMPs, additional, discretionary BMPs could also be identified. The BMPs would be subject to review and approval by the RWQCB. Because the SWPPP is an adaptive management tool, it must be updated as additional considerations arise and if additional BMPs are required to comply with discharge requirements. The measures themselves may be altered, supplemented, or deleted during the RWQCB’s review process because the RWQCB has final authority over the terms of the SWPPP.

Excavation and grading could encounter groundwater, requiring dewatering and short-term discharges of dewatering effluent (groundwater) to the separate storm sewer system. Discharge of groundwater from temporary construction dewatering activities would be regulated by the RWQCB by one of several mechanisms, depending on the quality and quantity of dewatering effluent and its potential to cause or contribute to violation of water quality standards. The permitting options are: 1) the Construction General Permit; 2) one of the three general NPDES permits regulating the discharge of extracted and treated groundwater to the storm drain system; or 3) an individual NPDES permit/WDR (Section 3.9.3.2, Surface Water Quality). These permits would include provisions for discharge limitations, peak flow and flow duration restrictions, other dewatering discharge requirements, and monitoring and reporting requirements. Because permit conditions would depend on the quality of the water discharged and the anticipated discharge rates, preparation and implementation of a Groundwater Dewatering Plan would be required. Based on the expectation that the dewatering operation would comply with permit conditions, and not violate the WDR, this project component of Alternative 1 would not cause water quality standards to be exceeded.

In-water and upland construction activities associated with shoreline protection features could result in the discharge of pollutants to stormwater runoff, incidental or accidental release of construction wastes (e.g., debris, sawdust, metal fragments, and concrete), or the accidental spill of construction materials (e.g., paints, and solvents) or substances commonly used in construction equipment (e.g., petroleum products) directly to the bay. Existing regulations would address in-water construction activities with the potential to affect water quality. Additional measures to protect water quality and biological resources during construction of the shoreline improvements also could be specified in the Section 404/10 permit and 401 Water Quality Certification. Permit conditions could include implementation of a spill prevention, containment, and cleanup plan and a debris management plan that would include measures for preventing or minimizing potentials for spills and releases, as well as measures for containing and cleaning up materials released to the bay. If appropriate, these permits could specify use of a silt curtain to minimize dispersion of resuspended sediments and/or seasonal restrictions (work windows) to minimize potentials for adverse impacts to sensitive species.

Shoreline construction activities, including removing existing piles, installing new piles and sheet pile, and placing shoreline abutments, would resuspend bottom sediments, resulting in localized and short-term plumes of turbid water with elevated suspended sediment concentrations. Typically, sediments resuspended by in-water construction activities settle rapidly (within hours) to the bottom. The duration of the turbidity plumes depends on the amount of material that is suspended, particle settling rates, and local currents that transport and disperse suspended materials. Chemical contaminants associated with bottom sediments would also be mobilized into the water column. Sediments affected by in-water construction activities in the vicinity of HPS likely contain elevated concentrations of some metal (e.g., mercury) and organic (e.g., PAHs and PCBs) contaminants (see Section 3.9.3.4, Sediment Quality). Some portion of the sediment-bound contaminants could be released to the water, resulting in short-term and localized increases in water column contaminant concentrations. However, these effects would be temporary, as contaminant concentrations would decline due to adsorption to settling particles, mixing, and dilution.

Construction activities related to shoreline improvements also would have the potential for remobilizing residual contamination from historical site activities. However, independent of the proposed action and this SEIS, the DoN, USEPA, DTSC, RWQCB, and CDPH would require that before any project site development activity occurs at HPS, appropriate and legally enforceable CERCLA Institutional Controls (ICs) in the form of a recorded covenant, deed provision, easement, or lease term would be in effect and applicable. Prior to disposal or lease of HPS property, DoN would address actual or potential releases of hazardous substances to ensure that the property after transfer will be used in a manner that is adequately protective of the environment and human health as required by CERCLA.

Construction of the Yosemite Slough bridge could require temporary placement of sheet piles to form coffer dams on either side of the bridge that would allow dewatering prior to placement of the pilings. Similar to the shoreline improvement and marina construction activities, placement of sheet piles would disturb bottom sediments in the slough and potentially remobilize sediment-associated contaminants into the water column. Also, in-water construction activities would have potentials for incidental releases of construction wastes (e.g., sawdust, metal fragments, and concrete) and accidental spills of construction materials (e.g., paints and solvents) or substances commonly associated with construction equipment (e.g., petroleum products) directly into the slough.

The potential for water quality impacts caused by construction of the bridge would be addressed by the SWPPP that would specify mechanisms for reducing sediment or pollutant loadings in stormwater runoff to the bay. In addition, because the bridge would be constructed using piles driven in dry conditions (behind coffer dams), water quality impacts would be minimized. Additional measures to protect water quality and biological resources during construction of the bridge also would be specified in the Section 404/10 permit and 401 Water Quality Certification.

Construction activities could also disturb contaminated soils and increase the potential for erosion and offsite transport of mobilized residual pollutants via exposure to surface water runoff and/or wind, thereby causing or contributing to surface water or groundwater quality degradation. The potential for water quality impacts caused by the construction activities, including contaminant remobilization, incidental release of construction materials, or accidental spills of substances commonly used in construction, would be addressed by the SWPPP that would specify measures (best management practices that could include structural measures for erosion and runoff control and housekeeping/waste management measures) for limiting the potential sediment and contaminant loadings in stormwater runoff to the bay.

Based on the expectation that the construction activities would comply with permit conditions and not violate the WDR, and with implementation of the SWPPP and specified BMPs, construction of Alternative 1 would not cause water quality standards to be exceeded, contribute to a violation of the applicable WDRs, or otherwise degrade water quality. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause water quality standards to be exceeded, and impacts to water resources would *not be significant*.

4.9.2.1.2 Factor 2: Alter Drainage Patterns

Construction would not substantially alter the existing drainage pattern of the site such that onsite or offsite erosion is substantially increased. Construction activities associated with Alternative 1 would largely preserve the existing drainage patterns, although the ground elevation would be raised (via the importation of fill soils) within portions of the site to protect the area from a potential rise in sea level. This would locally modify drainage patterns within the affected area. Because most of the affected area would drain to a newly constructed, separate, storm sewer system, this would not result in a substantial increase in erosion or siltation potential onsite or offsite. No streams or rivers exist within the project site so these types of resources would not be altered by construction activity. Therefore, impacts related to altered drainage patterns and potentials for increased erosion and siltation would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not substantially alter drainage patterns, and impacts to water resources would *not be significant*.

4.9.2.1.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Groundwater would not be used for any construction activities such as dust control or irrigation of vegetated erosion control features. Additionally, no groundwater wells would be developed as part of the project and no onsite groundwater wells would be used for water supplies. Short-term construction groundwater dewatering would have only a minor, temporary effect on the groundwater table elevation in the immediate vicinity of the activity. Further, construction activities generally would occur within areas that are already developed, and the project would result in a decrease in impervious surfaces of approximately 35 percent compared to existing conditions. Much of the existing open space would remain undeveloped, and the existing, natural surfaces would allow for continued infiltration of surface waters and contributions to groundwater recharge. Therefore, construction would not substantially deplete groundwater supplies or interfere with groundwater recharge, and impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not deplete groundwater or interfere with recharge, and impacts to water resources would *not be significant*.

4.9.2.1.4 Factor 4: Increase Risk of Flooding or Inundation

During construction at HPS, impervious surfaces would be removed and/or replaced and the project site would be graded to a 0.1 to 0.5 percent slope, resulting in no increase in stormwater runoff during construction. Existing stormwater drainage facilities would be replaced by new, entirely separate sewer systems that would collect and treat project site stormwater flows. This new storm drain system would be sized to convey a minimum of the 5-year storm event when flowing full or surcharged (overloaded/flooded), and runoff greater than the storm drain collection system capacity up to the 100-year storm event would be contained within the streets and drainage channels rights-of-way.

Construction of Alternative 1 would not substantially alter the existing drainage pattern of the site or increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite. Therefore, potential impacts related to risks from flooding or inundation would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not increase the risk of flooding or inundation, and impacts to water resources would *not be significant*.

4.9.2.2 Operational Impacts

4.9.2.2.1 Factor 1: Violate Water Quality Standards

Changes in pollutant loading from stormwater runoff for Alternative 1 operations would be affected by changes in runoff volumes and pollutant inputs associated with changes in land use. However, since Alternative 1 would reduce the area of impervious cover by approximately 35 percent compared to existing conditions, the reduction of impervious surfaces would be expected to reduce the volume of stormwater runoff from this area, as well as the magnitude of pollutant inputs to runoff. Table 4.9.2-1 identifies the estimated change in annual pollutant loads (without implementation of BMPs, meaning a worst case scenario) that would result from development. (The column for offsite residential loads represents the contributions to the onsite stormwater drainage system from HPS Phase I.) As a result of the conversion of primarily industrial lands to open space, residential, and commercial land, estimated pollutant loads would be reduced from existing conditions by approximately 34 to 74 percent. The net effect of these changes would be a net decrease in the total pollutants loads, even without the implementation of stormwater treatment BMPs.

Table 4.9.2-1. Estimated Change in Annual Pollutant Loads from HPS Without BMPs

Pollutant	*Existing (lbs)*	*Proposed Action (lbs)*	*Difference (%)*	*Offsite Residential (lbs)*
Total Suspended Solids	304,776	113,803	-63%	24,822
Ammonia	625	160	-74%	85.4
Nitrate+Nitrite as N	1,319	864	-34%	268
Total Kjeldahl Nitrogen	4,026	1,133	-72%	494
Total Nitrogen	5,345	1,997	-63%	762
Dissolved Phosphorous	386	142	-63%	68.8
Total Phosphorous	604	235	-61%	92.5
Total Cadmium	1.49	0.485	-67%	0.202
Total Chromium	26.9	7.91	-71%	3.32
Total Copper	43.0	13.8	-68%	3.63
Total Lead	105	36.6	-65%	17.3
Total Nickel	18.5	9.18	-50%	4.75
Total Zinc	496	159	-68%	44.6
Fecal Coliforms (billions of colonies)	4,262,577	2,182,629	-49%	1,173,810
Stormwater Volume (ac-ft)	465.8	229.8	-40%	78.7

Source: SFRA 2009.

Alternative 1 would include R&D space within certain areas, although some potential uses within this land use category may be considered industrial activities for the purposes of a stormwater permit. Any such industrial uses would be required to obtain coverage under an Industrial General Permit for stormwater discharges. Compliance with the Industrial General Permit would require the development and implementation of an industrial SWPPP.

Dry weather flows generated by urban development also have the potential to affect receiving water quality. Consistent with regulatory requirements, stormwater treatment BMPs would be implemented under the stormwater drainage master plan (SDMP) and stormwater control plan (SCP) for wet weather runoff, and these measures would also capture and treat dry weather flows. Compliance with these requirements would minimize the risk that dry weather flows would cause an exceedance of water quality standards or contribute to or cause a violation of applicable WDRs.

Standard marina activities, such as boat maintenance and operation, including leaching of biocides from boat hull anti-fouling paints, would have the potential to impact bay water and sediment quality. Although no fueling facilities are proposed as part of marina operations, spills or leaks of fuels from boats could affect water quality. Per the environmental controls for this alternative (Section 2.3.2.1.9, Environmental Controls), the marina operator would be required to obtain a certification by the Clean Marinas California Program to reduce potential water quality effects associated with marina operations. The Clean Marinas California Program has developed marina BMPs and an inspection and certification process for marinas that meet the program standard for BMP implementation. The marina operator would be required to implement BMPs that address the following sources of pollution: petroleum containment, topside boat maintenance and cleaning, underwater boat hull cleaning, marina operations, marina debris, boat sewage discharge, solid waste, liquid waste, fish waste, hazardous materials, and stormwater runoff. Stormwater runoff into the marina would also be regulated under the Municipal Stormwater General Permit. Compliance with the requirements of the Permit would reduce pollutant loadings to the marina basin and the potential for water quality impacts.

The presence of the breakwater would be expected to restrict water movement within the marina, as well as the exchange between the marina and adjacent portions of the bay. Consequently, rates of sediment deposition and accumulation within the marina could be comparatively higher than existing conditions and require periodic maintenance dredging to maintain navigable water depths. Maintenance dredging would require permits from the DMMO agencies. Dredging activities could result in the resuspension of previously undisturbed sediments, which could adversely affect water quality by generating suspended sediment plumes with high turbidity levels and reduced water clarity (SFEI 2008). Typically, dredging permits define limits for changes in water quality based on maximum turbidity levels at specified distances from the dredge. Permits also specify monitoring requirements to ensure compliance with water quality limits. Impacts to water quality from small-scale maintenance dredging operations typically are short-term and localized because suspended sediment plumes disperse rapidly (within hours) due to particle settling and mixing. Compliance with applicable regulatory requirements and permit conditions would minimize the risk that maintenance dredging operations would cause an exceedance of water quality standards or contribute to or cause a violation of applicable waste discharge requirements. Sediment testing, in accordance with DMMO guidance, would be required to demonstrate that dredged sediments are suitable for in-water disposal (e.g., in-bay or ocean).

Stormwater runoff from Yosemite Slough bridge could add pollutants such as fuels, PAHs, sediment, metals, and litter and debris to waters in the slough or the adjacent bay. Bridge maintenance activities such as welding and grinding, sandblasting, and painting could also adversely affect water quality if debris and wastes are allowed to discharge into the bay. It is anticipated that bridge operations would be under the jurisdiction of the city, and stormwater runoff would be regulated under the Municipal Stormwater General Permit, which requires a pollution prevention program for municipal operations. In particular, the bridge design would incorporate a greenway that would provide a stormwater treatment function (see Section 2.5.2.1.3). Impacts from bridge operations would be reduced via compliance with the existing stormwater runoff programs. Operation of Yosemite Slough bridge would not cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements.

Based on the expectation that the industrial operations would comply with the Municipal Stormwater General Permit and Industrial General Permit, and implement the specified BMPs, operation of Alternative 1 would not cause water quality standards to be exceeded. Therefore, impacts would *not be significant* with implementation of environmental controls described in Chapter 2 and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not cause water quality standards to be exceeded, and impacts to water resources would *not be significant*.

4.9.2.2.2 Factor 2: Alter Drainage Patterns

Offsite erosion or siltation impacts from new development can occur in the form of stream channel hydro-modification,[2] caused by new or expanded impervious cover that increases stormwater peak flow rates, volumes, and durations into a water body susceptible to bed or bank erosion. As discussed under project construction (Section 4.9.2.1.2), grading would not substantially alter drainage patterns of the site. The project site would discharge to a separate sewer system or the bay, which is not considered susceptible to erosion and siltation. There are no streams or rivers at the project site, and the project would not discharge directly or indirectly to a stream or river. Therefore, no erosion or siltation impacts

[2] Hydromodification refers to changes in the stream flow hydrograph (e.g., flow rate, timing of peak flows, flow duration, and flow volume). Stream channels are formed as a function of the water flow patterns (hydrograph). When patterns change (e.g., changes in runoff to the stream), the channel form (e.g., depth, width, curvature, substrate) and function (e.g., habitat quality, habitat area) can be altered as beds and banks erode (or build up) in response to the change in flow regime.

to streams or rivers would occur. Although some areas would continue to sheet flow to the bay, these areas would not receive additional flows from the developed portion of the project site, and the potential for increased erosion and sediment transport would be minimal. In addition, implementation of the SDMP and SCP that incorporate erosion and sediment transport control BMPs would be required to control post-construction erosion. Consequently, stormwater runoff from Alternative 1 operations would not alter runoff patterns such that substantial erosion or siltation would occur, and impacts to water resources would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not substantially alter drainage patterns, and impacts to water resources would *not be significant*.

4.9.2.2.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Because groundwater would not be used as a water supply source, the project would not deplete groundwater supplies. Overall, development of the project would result in a decrease in impervious surfaces of approximately 35 percent compared to existing conditions. By decreasing the extent of impervious cover, development at the project site would not interfere with groundwater recharge via natural percolation of rainfall.

Stormwater and recycled water infiltration to groundwater at HPS could degrade groundwater quality. The ability of potential stormwater COCs and recycled water constituents to infiltrate to the groundwater aquifer would depend on several factors, including: 1) mobility (measured by parameters such as solubility, sorption coefficients, and vapor pressure) and persistence (measured by the half-life) in soil; 2) land use patterns; and 3) COC amounts in stormwater and dry weather runoff. Groundwater in portions of the project site has been impacted historically by releases of various inorganic and organic constituents associated with current and previous land uses, and a remediation program is ongoing (Section 3.7, Hazards and Hazardous Materials). Data from the National Stormwater Quality Database (Maestre *et al*. 2005) indicate that stormwater runoff from land uses similar to the project (e.g., mixed residential, commercial, and industrial) has a TDS concentration of about 80 mg/L and a nitrate (as nitrogen) concentration of about 0.6 mg/L. These concentrations would not be expected to adversely affect groundwater quality. Use of recycled water could increase groundwater salinity because recycled water tends to concentrate salts and has a higher salt content than potable water. Compliance with the Recycled Water General Permit would ensure that application rates would not exceed agronomic requirements. As such, the potential for recycled water, and associated nitrates and TDS, leaching to groundwater would be minimized. Further, the underlying groundwater basins are only designated as potential municipal or domestic water supplies. As such, there are no applicable water quality standards.

Although the specific BMPs that would be implemented have yet to be identified, the stormwater low impact development (LID) Study identified various stormwater treatment opportunities. The potential for stormwater BMPs to result in mobilization of legacy soil contaminants would be reduced by placing fill soils in various locations to raise the land surface above the BFE, thereby increasing the thickness of the soil cover in those locations. Conversely, use of infiltration BMPs on disturbed areas of the HPS site would be precluded by site constraints related to the presence of residual contamination associated with historic land uses. Specifically, disturbance of interim or permanent caps and covers could alter the local groundwater gradient and cause or contribute to migration of groundwater pollutants to the bay. Therefore, alternative BMPs for stormwater quality control, reuse, and treatment would be used in lieu of BMPs that promote infiltration. For instance, biofiltration BMPs could be implemented with an impervious liner and subdrain system to treat stormwater runoff while preventing infiltration. Overland flow for events greater than the 5-year and up to the 100-year storm would be conveyed in lined channels or other conveyances that would not result in infiltration.

As Alternative 1 would not substantially deplete groundwater supplies or interfere with recharge, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not deplete groundwater or interfere with recharge, and impacts to water resources would *not be significant*.

4.9.2.2.4 Factor 4: Increase Risk of Flooding or Inundation

Operations for Alternative 1 would be required to comply with the provisions of Municipal Stormwater General Permit and the San Francisco Green Building Ordinance. Consistent with these requirements, the future developer or owner of the property would be required to submit a SDMP and SCP that would specify stormwater treatment BMPs to be implemented. The storm drainage system at HPS would handle stormwater by three methods: l) onsite treatment, such as vegetated swales, flow-through planter boxes, permeable pavement, green rooftops, and rainwater cisterns, for typical rainfall events (1.17-year storm); 2) stormwater runoff from the 85th percentile storm event would be treated before it enters the storm drains, allowing the system to discharge directly to San Francisco Bay without further management; and 3) excess stormwater from an event above a 5-year storm and up to a 100-year storm would be routed to the bay by overland flow along a network of street gutters and roadways. The particular method employed for an individual storm event would depend on the magnitude of the event.

The new separate storm sewer system for Alternative 1 would have sufficient capacity, when flowing full or surcharged (flow in manholes is above the top of the pipe) to carry the estimated stormwater runoff from the 5-year storm event, based on the ultimate development of the area, including natural drainage from upstream areas.

The design objective for overland flow is to allow streets and sidewalks to fully contain the 100-year event minus whatever flow is in the storm drain collection system without surcharging[3] (flooding) the adjacent development blocks (San Francisco Department of Public Works, BOE 1982). The overall drainage pattern (runoff into a piped system for the majority of the project site and sheet flow into the bay for remaining portions) would be preserved following development (MACTEC 2008b). Most of the project site would be graded with a 0.1 percent slope to facilitate overland flow, and the streets would have a waffling grade[4] of 0.5 percent to reduce localized stormwater ponding (MACTEC 2008b).

Table 4.9.2-2 lists the estimated project site stormwater runoff flow rates for existing and project conditions, as calculated using the Rational Method (San Francisco Department of Public Works, BOE 1982). For Alternative 1, flow rates listed in Table 4.9.2-2 do not include offsite flow from HPS Phase I. The HPS development would be designed to convey the 5-year storm event from HPS Phase I in the project storm drain system (108 cfs of flow for the 5-year storm event) in addition to project flows. However, HPS Phase I flows represent existing flows that drain to the separate storm system. Therefore, although these flows must be accounted for in the sizing of project storm drain infrastructure, they are not included in Table 4.9.2-2 because they are not project site flows and are not affected by development of Alternative 1.

As shown in Table 4.9.2-2, runoff peak flow rates from the project site would be reduced by 30 percent. Although these calculations are based on estimated site characteristics, it is not likely that more detailed data would indicate substantially lower peak flow rates. Table 4.9.2-2 also shows that runoff volumes from the 2-year, 24-hour storm (i.e., frequently occurring storms) would be reduced by 38 percent, which would also reduce the potential for onsite flooding impacts.

[3] Surcharging refers to overloading and flooding of the drainage system.
[4] A waffling grade refers to a surface texture marked by ridges and valleys that would help to channel flow.

Table 4.9.2-2. Estimated Existing and Project Stormwater Peak Flow Rates and Runoff Volumes Without BMPs

Storm Event	Existing (cfs) [b]	Proposed Action (cfs) [c]	Project Increase[a]	
			(cfs)	(%)
Hunters Point Shipyard[d]				
5-Year	644	448	-196	-30%
10-Year	730	509	-221	-30%
100-Year	1052	733	-319	-30%
2-Year 24-Hour (ac-ft)				
HPS	64	39	-24	-38%

Notes:

a. A negative number denotes a reduction in project flow rates compared to existing conditions.
b. Existing flows are based on 72 percent impervious surfaces (324 ac).
c. Project flows are based on 54 percent impervious surfaces (243 ac).
d. Offsite flow from HPS Phase I is not included in these runoff calculations. Required HPS Phase I diversions into the HPS separate stormwater sewer system would be 108 cfs.

Source: SFRA 2009.

Additionally, Alternative 1 would reduce the amount of impervious cover at the site compared to existing conditions. Because of the increase in permeable surface area, infiltration would be expected to increase, resulting in a corresponding decrease in runoff volumes. Downstream flooding would not occur because the project is directly upstream of the bay.

Alternative 1 would place housing within a Special Flood Hazard Area according to the preliminary flood insurance rate map for San Francisco and the City's Interim Floodplain Map (Figure 4.9.2-1). In accordance with the environmental controls for this alternative (Section 2.3.2.1.9, Environmental Controls), buildings and vital transportation infrastructure would be constructed at elevations that would not be exceeded by flood waters, even if the shoreline protection does not function, for existing conditions and over a longer term such as 50 to 100 years. The project site would be graded such that finished floor elevations would be 3.5 ft (1.1 m) above the BFE, and streets and pads would be 3 ft (0.9 m) above the existing BFE (see Section 2.5.2.1.7) to allow for future sea level rise, thereby elevating all housing and structures above the existing and potential future flood hazard area. Additionally, shoreline and public access improvements would be designed to allow future increases in elevation along the shoreline edge to keep up with higher sea level rise values, should they occur. Design elements would include providing adequate setbacks to allow for future elevation increases of at least 3 ft from the existing elevation along the shoreline. The future developer or owner of the property would form (or annex into if appropriate) and administer a special assessment district or other funding mechanism to finance and construct future improvements necessary to ensure that the shoreline, public facilities, and public access improvements would be protected should sea level rise exceed 16 in (41 cm) at the perimeter of the project. The district would also administer a Monitoring and Adaptive Management Plan to monitor sea level and implement and maintain the protective improvements.

While development at HPS could place structures within a Special Flood Hazard Area (Zone A), structures within Zone A that do not fall within a designated floodway would not be expected to impede or redirect flood flows. According to proposed site plans, the portions of HPS that fall within a Special Flood Hazard Area are proposed to be used for stadium parking.

The storm drainage system would be constructed to accommodate a mid-term rise in sea levels of 16 in (41 cm), with a design that is adaptable to meet higher-than-anticipated sea level rise values. This would avoid installing pumps and other appurtenances at the present time when they are not needed, while still ensuring that an adaptation strategy and a funding mechanism would exist for future management actions.

Figure 4.9.2-1. Flood Zones (with the Stadium Plan Alternative 1)

The proposed shoreline improvements would serve to protect the project site from flooding. However, several of these features lack structural integrity and could fail suddenly, as the result of a large storm event or an earthquake, or gradually through continued deterioration. The environmental controls for Alternative 1 specify that areas along the shoreline would be developed as open space, which would allow for implementation of additional flood control improvements, if necessary, in the case of a higher-than-anticipated sea level rise. The shoreline improvements would also reinforce the structural integrity of the existing shoreline, reducing the risk of sudden structural failure of deteriorated shoreline features. Such improvements would provide added protection against project site flooding.

The shoreline protection system would be built to accommodate a mid-term rise in sea level of 16 in (41 cm), with a design that is adaptable to meet higher-than-anticipated values in the mid-term, as well as for the longer term. In addition, the shoreline and public access improvements would be designed with a development setback to allow any future increases in elevation to accommodate higher sea level rise values, should they occur. This conservative shoreline design for sea level rise, as well as the development setback from the shoreline, would protect the site against coastal flooding hazards including high-velocity wave forces that could impede flood flows or cause flood flows to be directed to any portions of the site including open space or developed areas.

The conceptual design of the Yosemite Slough bridge would avoid potential impedance of flood flows. The Yosemite Slough bridge would be designed such that the superstructure would be well above the current 100-year flood hazard elevation in Zone V, to account for future sea level rise. Therefore, bridge operations would not increase flooding risks. Further, the bridge structure would not restrict tidal flushing or circulation of bay waters in the slough.

A substantial tsunami wave could affect areas of the project site adjacent to the shoreline. Development finished grades, which account for sea level rise and 100-year flood elevations, would be more than one ft (0.3 m) above the potential tsunami wave run-up elevations. Inundation caused by a seiche could be triggered by seismic activity, tsunamis, or tides. Finished grade elevations for the project would protect the project site from a seiche.

According to ABAG (2008c), the project site is adjacent to, but not within, the dam failure inundation zones from failure of the University Mound South Basin and/or North Basin reservoirs. Mudflow hazards typically occur where unstable hillslopes are located above gradient, where site soils are unstable and subject to liquefaction, and when substantial rainfall saturates soils causing failure. Refer to Section 4.8, Geology and Soils, for a discussion of the impacts related to mudflows and other types of landslides.

Potential risks associated with placement of housing and structures in flood-prone areas, and for risks associated with failures of shoreline improvements, would *not be significant* with implementation of environmental controls described in Chapter 2 and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not increase the risk of flooding or inundation with implementation of environmental controls described in Chapter 2, and impacts to water resources would *not be significant*.

4.9.3 Alternative 1A: Stadium Plan/No-Bridge Alternative

4.9.3.1 Construction Impacts

Impacts to water resources associated with construction activities for Alternative 1A would be the same as those for Alternative 1 because the construction methods would be similar and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1.

4.9.3.1.1 Factor 1: Violate Water Quality Standards

Similar to Alternative 1, construction activities associated with Alternative 1A that complied with applicable regulatory requirements would not violate water quality standards, cause an exceedance of water quality standards, or contribute to or cause a violation of waste discharge requirements due to runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause water quality standards to be exceeded, and impacts to water resources would *not be significant*.

4.9.3.1.2 Factor 2: Alter Drainage Patterns

During construction of Alternative 1A, the existing drainage patterns within the area would generally be preserved. Construction activities would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion or siltation, onsite or offsite. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not substantially alter drainage patterns, and impacts to water resources would *not be significant*.

4.9.3.1.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Excavation for building foundations and underground utilities could require short-term and/or long-term dewatering of the affected areas. This would not substantially alter groundwater levels or deplete groundwater supplies. Because the total amount of open space under Alternative 1A would remain the same as under Alternative 1, the amount of permeable surface would also remain the same. Therefore, Alternative 1A would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level, as described for Alternative 1. This impact would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not deplete groundwater or interfere with recharge, and impacts to water resources would *not be significant*.

4.9.3.1.4 Factor 4: Increase Risk of Flooding or Inundation

Construction activities associated with Alternative 1A would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat onsite stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. Construction activities would not substantially alter the existing drainage pattern of the site or result in flooding onsite or offsite. Based on compliance with regulatory requirements and implementation of an SWPPP, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not increase the risk of flooding or inundation, and impacts to water resources would *not be significant*.

4.9.3.2 Operational Impacts

Impacts to water resources from operation of Alternative 1A would be the same as those discussed for Alternative 1 (Section 4.9.2.2).

4.9.3.2.1 Factor 1: Violate Water Quality Standards

Stormwater runoff from the project site, including the marina, would be regulated by a Municipal Stormwater General Permit and Industrial General Permit. Compliance with permit conditions and other applicable regulations would minimize the risk that the project would contribute to violations of water quality standards or WDRs or otherwise degrade water quality. Per the environmental controls described in Chapter 2, marina operations would comply with the Clean Marinas California Program and implementation of BMPs would minimize potentials for impacts to bay water quality. Similarly, maintenance dredging of the marina, conducted in accordance with regulatory requirements and permit conditions, would not degrade water or sediment quality or interfere with beneficial uses of the bay. Therefore, impacts would *not be significant* with implementation of environmental controls described in Chapter 2 and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not cause water quality standards to be exceeded, and impacts to water resources would *not be significant*.

4.9.3.2.2 Factor 2: Alter Drainage Patterns

Operation of Alternative 1A would not alter the course of a stream or river or result in substantial erosion, siltation, or flooding onsite or offsite. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not substantially alter drainage patterns, and impacts to water resources would *not be significant*.

4.9.3.2.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Operations under Alternative 1A would not utilize groundwater as a source of water supply or interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not deplete groundwater or interfere with recharge, and impacts to water resources would *not be significant*.

4.9.3.2.4 Factor 4: Increase Risk of Flooding or Inundation

Alternative 1A operations would not contribute runoff water volumes that would exceed the capacity of planned storm sewer systems or provide substantial additional sources of polluted runoff, because development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the bay.

Alternative 1A would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Alternative 1A would not expose people or structures to a significant risk of loss, injury, or death as a result of the failure of a levee or dam, and it would not expose people or structures to inundation by seiche, tsunami, or mudflow. Potential risks of failure of shoreline improvement components, with subsequent hazards to structures and public safety, are addressed by environmental controls described in Chapter 2. With implementation of these measures, potential impacts from flooding or inundation would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not increase the risk of flooding or inundation with implementation of environmental controls described in Chapter 2, and impacts to water resources would *not be significant*.

4.9.4 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

4.9.4.1 Construction Impacts

Impacts to water resources associated with construction activities for Alternative 2 would be the same as those for Alternative 1 because the construction methods and construction footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1.

4.9.4.1.1 Factor 1: Violate Water Quality Standards

Similar to Alternative 1, construction activities associated with Alternative 2 that complied with applicable regulatory requirements would not violate water quality standards, cause an exceedance of water quality standards, or contribute to or cause a violation of waste discharge requirements due to runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2, would not cause water quality standards to be exceeded, and impacts to water resources would *not be significant*.

4.9.4.1.2 Factor 2: Alter Drainage Patterns

During construction of Alternative 2, the existing drainage patterns within the area would generally be preserved. Construction activities would not substantially alter the existing drainage pattern of the site or alter the course of a stream or river in ways that would result in substantial erosion or siltation, onsite or offsite, similar to Alternative 1. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2, would not cause substantial erosion or siltation, and impacts to water resources would *not be significant*.

4.9.4.1.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Excavation for building foundations and underground utilities could require short-term and/or long-term dewatering of the affected areas. This would not substantially alter groundwater levels or deplete groundwater supplies. Because the total amount of open space under Alternative 2 would remain the same as under Alternative 1, the amount of permeable surface would also remain the same. Therefore, Alternative 2 would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level, similar to Alternative 1. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2, would not deplete groundwater or interfere with recharge, and impacts to water resources would *not be significant*.

4.9.4.1.4 Factor 4: Increase Risk of Flooding or Inundation

Construction activities associated Alternative 2 would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat onsite stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. Construction activities would not substantially alter the existing drainage pattern of the site or result in flooding onsite or offsite. Based on compliance with regulatory requirements and implementation of an SWPPP, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2, would not increase risk of flooding or inundation, and impacts to water resources would *not be significant*.

4.9.4.2 Operational Impacts

Impacts to water resources from operation of Alternative 2 would be the same as those discussed for Alternative 1 (Section 4.9.2.2).

4.9.4.2.1 Factor 1: Violate Water Quality Standards

Stormwater runoff from the project site, including the marina and Yosemite Slough bridge, would be regulated by a Municipal Stormwater General Permit and Industrial General Permit. Compliance with permit conditions and other applicable regulations would minimize the risk that the project would contribute to violations of water quality standards or WDRs or otherwise degrade water quality. Per the environmental controls described in Chapter 2, marina operations would comply with the Clean Marinas California Program, and implementation of BMPs would minimize potentials for impacts to bay water quality. Similarly, maintenance dredging of the marina, conducted in accordance with regulatory requirements and permit conditions would not degrade water or sediment quality or interfere with beneficial uses of the bay. Therefore, impacts would *not be significant* with implementation of environmental controls described in Chapter 2 and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2, would not cause water quality standards to be exceeded, and impacts to water resources would *not be significant*.

4.9.4.2.2 Factor 2: Alter Drainage Patterns

Operation of Alternative 2 would not alter the course of a stream or river or result in substantial erosion, siltation, or flooding onsite or offsite. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2, would not cause substantial erosion or siltation, and impacts to water resources would *not be significant*.

4.9.4.2.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Operations under Alternative 2 would not utilize groundwater as a source of water supply or interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2, would not deplete groundwater or interfere with recharge, and impacts to water resources would *not be significant*.

4.9.4.2.4 Factor 4: Increase Risk of Flooding or Inundation

Alternative 2 operations would not contribute runoff water volumes that would exceed the capacity of planned storm sewer systems or provide substantial additional sources of polluted runoff because development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the bay. Therefore, impacts would *not be significant* with implementation of environmental controls described in Chapter 2 and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2, would not increase the risk of flooding or inundation with implementation of environmental controls described in Chapter 2, and impacts to water resources would *not be significant*.

4.9.5 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

4.9.5.1 Construction Impacts

Impacts to water resources associated with construction activities for Alternative 2A would be the same as those for Alternative 2 because the construction methods and construction footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 2.

4.9.5.1.1 Factor 1: Violate Water Quality Standards

Similar to Alternative 2, construction activities associated with Alternative 2A would comply with applicable regulatory requirements, and would not violate water quality standards, cause an exceedance of water quality standards, or contribute to or cause a violation of waste discharge requirements due to runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2A, would not cause water quality standards to be exceeded, and impacts to water resources would *not be significant*.

4.9.5.1.2 Factor 2: Alter Drainage Patterns

During construction of Alternative 2A, the existing drainage patterns within the area would generally be preserved. Construction activities would not alter the course of a stream or river in ways that would result in substantial erosion or siltation, onsite or offsite. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2A, would not cause substantial erosion or siltation, and impacts to water resources would *not be significant*.

4.9.5.1.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Excavation for building foundations and underground utilities could require short-term and/or long-term dewatering of the affected areas. This would not substantially alter groundwater levels and would not substantially deplete groundwater supplies. Because the total amount of open space under Alternative 2A would remain the same as under Alternative 1, the amount of permeable surface would also remain the same. Therefore, Alternative 2A would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level, and impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2A, would not deplete groundwater or interfere with recharge, and impacts to water resources would *not be significant*.

4.9.5.1.4 Factor 4: Increase Risk of Flooding or Inundation

Construction activities associated with Alternative 2A would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat onsite stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. Construction activities would not substantially alter the existing drainage pattern of the site or result in flooding onsite or offsite. Based on compliance with regulatory requirements and implementation of an SWPPP, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2A, would not increase risk of flooding or inundation, and impacts to water resources would *not be significant*.

4.9.5.2 Operational Impacts

Impacts to water resources from operation of Alternative 2A would be the same as those discussed for Alternative 2 (Section 4.9.4.2).

4.9.5.2.1 Factor 1: Violate Water Quality Standards

Stormwater runoff from the project site, including the marina and Yosemite Slough bridge, would be regulated by a Municipal Stormwater General Permit and Industrial General Permit. Compliance with permit conditions and other applicable regulations would minimize the risk that the project would contribute to violations of water quality standards or WDRs or otherwise degrade water quality. Per the environmental controls described in Chapter 2, marina operations would comply with the Clean Marinas California Program, and implementation of BMPs would minimize potentials for impacts to bay water quality. Similarly, maintenance dredging of the marina, conducted in accordance with regulatory requirements and permit conditions would not degrade water or sediment quality or interfere with beneficial uses of the bay. Therefore, impacts would *not be significant* with implementation of environmental controls described in Chapter 2 and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2A, would not cause water quality standards to be exceeded, and impacts to water resources would *not be significant*.

4.9.5.2.2 Factor 2: Alter Drainage Patterns

Operation of Alternative 2A would not substantially alter the existing drainage pattern of the site, and it would not alter the course of a stream or river or result in substantial erosion, siltation, or flooding onsite or offsite. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2A, would not cause substantial erosion or siltation, and impacts to water resources would *not be significant*.

4.9.5.2.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Operations under Alternative 2A would not utilize groundwater as a source of water supply or interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2A, would not deplete groundwater or interfere with recharge, and impacts to water resources would *not be significant*.

4.9.5.2.4 Factor 4: Increase Risk of Flooding or Inundation

Alternative 2A operations would not contribute runoff water volumes that would exceed the capacity of planned storm sewer systems or provide substantial additional sources of polluted runoff, because development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the bay. Alternative 2A would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Alternative 2A would not expose people or structures to a significant risk of loss, injury, or death as a result of the failure of a levee or dam, and it would not expose people or structures to inundation by seiche, tsunami, or mudflow. Potential risks of failure of shoreline improvement components, with subsequent hazards to structures and public safety, are addressed by environmental controls described in Chapter 2. With implementation of these environmental controls, impacts from flooding or inundation would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 2A, would not increase the risk of flooding or inundation with implementation of environmental controls described in Chapter 2, and impacts to water resources would *not be significant*.

4.9.6 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

4.9.6.1 Construction Impacts

Impacts to water resources associated with construction activities for Alternative 3 would be the same as those for Alternative 1 because the construction methods and project footprints would be comparable, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1.

4.9.6.1.1 Factor 1: Violate Water Quality Standards

Construction activities associated with Alternative 3 that complied with applicable regulatory requirements would not violate water quality standards or cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 3, would not cause water quality standards to be exceeded, and impacts to water resources would *not be significant*.

4.9.6.1.2 Factor 2: Alter Drainage Patterns

During construction of Alternative 3, the existing drainage patterns within the area generally would be preserved. Construction activities would not substantially alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding onsite or offsite. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 3, would not cause substantial erosion or siltation, and impacts to water resources would *not be significant*.

4.9.6.1.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Groundwater would not be used for any construction activities or irrigation of vegetated erosion control features, no groundwater wells would be developed, and no onsite groundwater wells would be used for water supplies. Excavation for building foundations and underground utilities could require short-term and/or long-term dewatering of the affected areas. Localized dewatering would not substantially alter groundwater levels or deplete groundwater supplies. Because the total amount of open space under Alternative 3 would be similar to Alternative 1, the amount of permeable surface also would be similar. Therefore, Alternative 3 would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level, as described for Alternative 1. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 3, would not deplete groundwater or interfere with recharge, and impacts to water resources would *not be significant*.

4.9.6.1.4 Factor 4: Increase Risk of Flooding or Inundation

Construction activities associated with Alternative 3, including site clearance, grading, and excavation, would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat onsite stormwater flows and would be sized to accommodate projected flows from upstream contributing areas. Construction activities would not substantially alter the existing drainage pattern of the site or result in flooding onsite or offsite. Based on compliance with regulatory requirements, and implementation of an SWPPP, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 3, would not increase risk of flooding or inundation, and impacts to water resources would *not be significant*.

4.9.6.2 Operational Impacts

Impacts to water resources from operation of Alternative 3 would be the same as those discussed for Alternative 1 (Section 4.9.2.2).

4.9.6.2.1 Factor 1: Violate Water Quality Standards

Stormwater runoff from the project site, including the marina and Yosemite Slough bridge, would be regulated by a Municipal Stormwater General Permit and Industrial General Permit. Compliance with permit conditions and other applicable regulations would minimize the risk that the project would contribute to violations of water quality standards or WDRs or otherwise degrade water quality. Marina operations would comply with the Clean Marinas California Program, and implementation of BMPs would minimize potentials for impacts to bay water quality. Similarly, maintenance dredging of the marina, conducted in accordance with regulatory requirements and permit conditions would not degrade water or sediment quality or interfere with beneficial uses of the bay. Therefore, impacts would *not be significant* with implementation of environmental controls described in Chapter 2 and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 3, would not cause water quality standards to be exceeded, and impacts to water resources would *not be significant*.

4.9.6.2.2 Factor 2: Alter Drainage Patterns

Operations under Alternative 3 would not substantially alter the existing drainage pattern of the site, and it would not alter the course of a stream or river or result in substantial erosion or siltation onsite or offsite. Therefore, impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 3, would not cause substantial erosion or siltation, and impacts to water resources would *not be significant*.

4.9.6.2.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Operations under Alternative 3 would not utilize groundwater as a source of water supply or interfere substantially with groundwater recharge. Thus, a net deficit in aquifer volume or lowering of the local groundwater table level would not occur and impacts would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 3, would not deplete groundwater or interfere with recharge, and impacts to water resources would *not be significant*.

4.9.6.2.4 Factor 4: Increase Risk of Flooding or Inundation

Alternative 3 operations would not contribute runoff water volumes that would exceed the capacity of planned storm sewer systems or provide substantial additional sources of polluted runoff, because development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the bay. Alternative 3 would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Alternative 3 would not expose people or structures to a significant risk of loss, injury, or death as a result of the failure of a levee or dam, and it would not expose people or structures to inundation by seiche, tsunami, or mudflow. The potential future risks of flooding following sea level rise or failure of shoreline improvement components, with subsequent hazards to structures and public safety, would be addressed with environmental controls for water resources, as described in Chapter 2. Therefore, impacts from flooding or inundation would *not be significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D, or to site drainage patterns associated with the Building Preservation option for Alternative 3, would not increase the risk of flooding or inundation with implementation of environmental controls described in Chapter 2, and impacts to water resources would *not be significant*.

4.9.7 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

4.9.7.1 Construction Impacts

Impacts to water resources associated with construction activities for Alternative 4 would be similar to those for Alternative 1 because the construction methods and project footprints would be comparable and construction activities would be subject to the same regulations and permit conditions that would be apply to Alternative 1. However, Alternative 4 would not construct a bridge over Yosemite Slough, construct or operate a marina, or provide shoreline improvements, thereby eliminating the potential for effects to water resources from these construction and operational activities.

4.9.7.1.1 Factor 1: Violate Water Quality Standards

Construction activities associated with Alternative 4 would not violate water quality standards, cause an exceedance of water quality standards or contribute to or cause a violation of waste discharge requirements due to runoff, contaminated groundwater from dewatering activities, or the incidental or accidental release of construction materials. With implementation of an SWPPP, impacts would *not be significant* and no mitigation is proposed.

4.9.7.1.2 Factor 2: Alter Drainage Patterns

Construction of Alternative 4 would not substantially change existing drainage patterns within the project vicinity or alter the course of a stream or river in ways that would result in substantial erosion, siltation, or flooding onsite or offsite. Therefore, impacts would *not be significant* and no mitigation is proposed.

4.9.7.1.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Groundwater would not be used for any construction activities or irrigation of vegetated erosion control features, and no groundwater wells would be developed as part of Alternative 4. Excavation for building foundations and underground utilities could require short-term and/or long-term dewatering of the affected areas. Localized dewatering would not substantially alter groundwater levels or deplete groundwater supplies. Because the total amount of open space under Alternative 4 would be similar to Alternative 1, the amount of permeable surface also would be similar. Therefore, construction activities for Alternative 4 would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level, as described for Alternative 1. Therefore, impacts would *not be significant* and no mitigation is proposed.

4.9.7.1.4 Factor 4: Increase Risk of Flooding or Inundation

Construction activities associated with Alternative 4 would not create or contribute runoff water that would exceed the capacity of existing or planned storm sewer systems or provide substantial additional sources of polluted runoff. During construction, existing stormwater drainage facilities would be replaced by a new storm sewer system that would collect and treat onsite stormwater flows, and it would be sized to accommodate projected flows from upstream contributing areas. Construction activities would not substantially alter the existing drainage pattern of the site or result in flooding onsite or offsite, and impacts would *not be significant* and no mitigation is proposed.

4.9.7.2 Operational Impacts

Impacts to water resources from operation of Alternative 4 would be similar to those discussed for Alternative 1 (Section 4.9.2.2), with the exception that Alternative 4 would not include the Yosemite Slough bridge or marina operations.

4.9.7.2.1 Factor 1: Violate Water Quality Standards

Stormwater runoff from the project site would be regulated by a Municipal Stormwater General Permit and Industrial General Permit. Compliance with permit conditions and other applicable regulations would minimize the risk that the project would contribute to violations of water quality standards or WDRs or otherwise degrade water quality. Therefore, impacts would *not be significant* and no mitigation is proposed.

4.9.7.2.2 Factor 2: Alter Drainage Patterns

Operation of Alternative 4 would not substantially alter the existing drainage pattern of the site, and it would not alter the course of a stream or river or result in substantial erosion, siltation, or flooding onsite or offsite. Therefore, impacts would *not be significant* and no mitigation is proposed.

4.9.7.2.3 Factor 3: Deplete Groundwater or Interfere with Recharge

Alternative 4 would not utilize groundwater as a source of water supply or interfere substantially with groundwater recharge. Thus, there would be no net deficit in aquifer volume or a lowering of the local groundwater table level, and impacts would *not be significant* and no mitigation is proposed.

4.9.7.2.4 Factor 4: Increase Risk of Flooding or Inundation

Alternative 4 operations would not contribute runoff water volumes that would exceed the capacity of planned storm sewer systems or provide substantial additional sources of polluted runoff because development would include a separate stormwater system that would be sized to accommodate estimated runoff flows and treat runoff prior to discharge to the bay. With implementation of environmental controls for water resources, as described in Chapter 2, Alternative 4 would not place housing and other structures within a 100-year flood zone or otherwise include development that would impede or redirect flood flows. Alternative 4 would not expose people or structures to a significant risk of loss, injury, or death as a result of the failure of a levee or dam, and it would not expose people or structures to inundation by seiche, tsunami, or mudflow. Therefore, impacts would *not be significant* with implementation of environmental controls described in Chapter 2 and no mitigation is proposed.

4.9.8 No Action Alternative

4.9.8.1 Impacts

Under the No Action Alternative, HPS would be a closed federal property under caretaker status and no construction or reuse would occur, although existing leases would continue and could be extended or renewed.

4.9.8.1.1 Factor 1: Violate Water Quality Standards

Given that no construction or reuse-related operations would occur, the No Action Alternative would not violate water quality standards, cause an exceedance of water quality standards, or contribute to or cause a violation of waste discharge requirements. Therefore, there would be *no impacts* to water resources.

4.9.8.1.2 Factor 2: Alter Drainage Patterns

The No Action Alternative would preserve existing drainage patterns within the area. Under existing conditions, stormwater typically drains to storm drains or directly to the bay via surface runoff (generally only along portions of the shoreline). Because the No Action Alternative would not alter the existing drainage pattern of the site in ways that would result in substantial erosion or siltation onsite or offsite, there would be *no impacts*.

4.9.8.1.3 Factor 3: Deplete Groundwater or Interfere with Recharge

The No Action Alternative would not increase groundwater withdrawals or interfere with recharge. Therefore, there would be *no impacts* to groundwater resources.

4.9.8.1.4 Factor 4: Increase Risk of Flooding or Inundation

The No Action Alternative would not expose people or structures to a significant risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam. Furthermore, based on historical records and the location of development, there is minimal risk of exposing people or structures to inundation by seiche, tsunami, or mudflow. However, portions of HPS are located within a special flood hazard zone (Zone A), as mapped on the preliminary flood insurance rate map. Considering the projected future sea level rise, structures located in the portions of HPS within Zone A may be susceptible to future flooding or inundation that could expose structures or people to risk of loss, injury, or death. This impact would be *potentially significant* if existing leases were renewed or extended.

4.9.9 Impacts and Mitigation Summary

Significant impacts to water resources are summarized in Table 4.9.9-1. The proposed action and alternatives would not result in significant impacts to water resources. The only alternative with potentially significant impacts is the No Action Alternative. There are no proposed mitigation measures for any of the project alternatives or the No Action Alternative.

Table 4.9.9-1. Mitigations for Potential Significant Impacts the Proposed Action and Alternatives

Significance Factor	*Mitigation Measures*						
	Alternative 1 (Stadium Plan Alternative)	***Alternative 1A (Stadium Plan/No-Bridge Alternative)***	***Alternative 2 (Non-Stadium Plan/Additional R&D Alternative)***	***Alternative 2A (Non-Stadium Plan/Housing and R&D Alternative)***	***Alternative 3 (Non-Stadium Plan/Additional Housing Alternative)***	***Alternative 4 (Non-Stadium Plan/Reduced Development Alternative)***	***No Action Alternative***
Factor 4: Increase risks to human health and safety or for economic damage by siting incompatible land uses and facilities within areas susceptible to flooding or inundation.	No significant impacts or mitigation measures.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Potentially significant impacts due to future flooding following sea level rise; no mitigation proposed.

4.10 Utilities

4.10.1 Methodology

4.10.1.1 Significance Factors

Factors considered in determining whether an alternative would have significant impacts on utilities include the extent or degree to which the implementation of an alternative would:

4.10.1.1.1 Water

Factor 1 Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; and/or

Factor 2 Require new or expanded water entitlements and resources, if available water supplies are not sufficient to serve the project from existing entitlements and resources.

4.10.1.1.2 Wastewater

Factor 3 Require or result in the construction of new wastewater treatment or collection facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; and/or

Factor 4 Result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

4.10.1.1.3 Solid Waste

Factor 5 Be served by a landfill with insufficient permitted capacity to accommodate proposed action-related solid waste disposal needs; and/or

Factor 6 Fail to comply with applicable solid waste regulations.

4.10.1.1.4 Energy and Telecommunications

Factor 7 Require or result in the construction of new or expansion of existing utility infrastructure, the construction of which could cause significant environmental effects;

Factor 8 Result in a determination by the utility service provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments; and/or

Factor 9 Encourage activities that result in the use of large amounts of fuel or energy, or use such resources in a wasteful manner.

4.10.1.2 Analytic Method

4.10.1.2.1 Factors 1 and 2: Water

The analysis in this section focuses on the potential for a change in existing and projected water use as a result of implementing the project alternatives. The primary resources used for this analysis include the following technical documents: *Candlestick Point/Hunters Point Shipyard Phase II Water Demand Memorandum* (15 October 2009), prepared by ARUP; *Water Supply Assessment for the Proposed*

Candlestick Point – Hunters Point Shipyard Phase II Project (October 2009), prepared by PBS&J; *Water Supply Availability Study of City and County of San Francisco* (October 2009), prepared by PBS&J; *SFPUC Urban Water Management Plan* (December 2005), prepared for the SFPUC; and the *Final Programmatic Environmental Impact Report for the Water Supply Improvement Program* (October 2008), prepared by the San Francisco Planning Department.

This section evaluates whether existing water treatment facilities have sufficient treatment capacity to serve the project alternatives and whether an adequate and reliable source of water would be available to serve the project alternatives, both of which require an estimate of water demand that would result from implementing the project alternatives.

Estimates of water demand for the project were developed for Lennar Urban by ARUP provided in Appendix Q2 of the CP-HPS DEIR (SFRA 2009). An independent analysis performed as a part of the WSA provided in Appendix Q1 of the CP-HPS DEIR (SFRA 2009), which analyzed similar land uses and assigned a demand factor for each use, concluded that the demand estimates prepared by ARUP provided in Appendix Q2 (SFRA 2009) are consistent with SFPUC demand factors.

Existing and projected future water supplies for SFPUC retail customers were compared with estimated future demand to determine whether water supplies would be sufficient to meet project-related demands. The current status of ongoing water supply improvements was also assessed to determine whether the anticipated future water sources would be available.

The current and planned treatment capacity of existing water treatment facilities was also reviewed to determine whether sufficient capacity exists to provide water treatment service to the project alternatives.

4.10.1.2.2 Factors 3 and 4: Wastewater

Sanitary sewer flows were determined utilizing wastewater generation percentages based on land use and end use water demand. These factors were then adjusted to account for conformance with the City of San Francisco Green Building Ordinance. Wastewater estimates were made based on estimated water demand in the Water Demand Memorandum (Table 7) provided in Appendix Q2 of the CP-HPS DEIR (SFRA 2009). Parks and open space wastewater generation (runoff) is not included in this table, as it would not be conveyed offsite to the sewer system.

Wastewater impacts were determined by comparing the estimated future wastewater flows to the capacity of offsite conveyance lines and the wastewater treatment plants to determine whether sufficient capacity exists or whether there would be a need for additional wastewater conveyance or treatment systems.

The project alternatives would construct separate stormwater and wastewater systems. Thus, during wet weather, stormwater from the project site would not enter the Combined Sewer System; the only flows that would enter the Combined Sewer System, during both dry and wet weather, would be wastewater. For the purposes of this analysis, dry-weather peak flows from the project alternatives would be the same as wet-weather peak flows, and there is no need to analyze stormwater flow volumes relative to conveyance capacity of the wastewater system. Therefore, dry-weather peak flows are assumed to be the same as wet-weather flows.

The capacity of conveyance systems is analyzed by comparing maximum peak flows to the design capacity of the trunk line, expressed in gallons per minute (GPM). Wastewater treatment capacity is analyzed by comparing the daily treatment capacity of the plant, expressed in MGD, with the existing conditions plus proposed wastewater generation. This analysis evaluates the design capacity of the sewer trunk line serving the project site, the existing average flow, the calculated existing maximum peak flow, the contribution of the project alternatives to the offsite conveyance infrastructure, and the remaining capacity (with the project alternative) of each of the two trunk lines. Discharges from the project site flow only into the Hunters Point tunnel sewer.

Several planning studies, referenced in Section 4.10.1.2.1, were prepared to identify the wastewater volumes and the associated conveyance infrastructure necessary for the project alternatives. This analysis relies on those estimates. Two different methods were used to calculate wastewater generation: 1) percentage of water demand; and 2) by end use (e.g., toilets, laundry, process water, etc.). This analysis uses the first method because it is more conservative. Calculations assume full compliance with the City of San Francisco Green Building Ordinance.

As required by the Green Building Ordinance, high-rise and large buildings are required to reduce water use by 30 percent in 2011 from a benchmark level adjusted for code. This requirement would result in a corresponding decrease in wastewater generation. Methods to achieve this standard could include, but are not limited to, low-flow plumbing fixtures, waterless urinals, and dual-flush toilets. Additional requirements for high-rise residential and large commercial buildings include water-efficient landscaping to reduce potable water use by 50 percent. Wastewater volume estimates take these Green Building Ordinance requirements into account. Peak dry-weather flow was calculated by multiplying the average GPM flow by a peaking factor. For purposes of this analysis, a conservative peaking factor of 3.0 was used.

4.10.1.2.3 Factors 5 and 6: Solid Waste

To determine the amount of solid waste that would be generated by the project alternatives, solid waste generation factors identified by the CIWMB are applied to the proposed land uses. Construction-related solid waste results from demolition of existing structures and infrastructure (including asphalt and concrete) and waste from excess building materials. To determine solid waste impacts associated with project implementation, estimated future solid waste generation amounts are compared to the total anticipated remaining capacity at the Altamont Landfill to determine whether adequate capacity exists.

4.10.1.2.4 Factors 7, 8, and 9: Energy and Telecommunications

The requirements of the project alternatives on electricity, natural gas, and telecommunications/cable infrastructure are compared against the existing capacity of the service providers to accommodate additional demands. The assessment of the energy expected to be consumed during construction and operation also considers the energy efficiency features when evaluating the project's potential for wasteful energy consumption.

Data from the Climate Change Technical Report prepared by ENVIRON International Corporation provided in Appendix S of the CP-HPS DEIR (SFRA 2009) were used to estimate the total energy use per residential unit for space heating and cooling, domestic hot water systems, lighting, and other energy-consuming components of a typical building envelope. An energy efficiency performance target has been set at 15 percent below the energy efficient standards stipulated in the 2008 24 CCR. Project designs would include measures such as high performance glazing, efficient lighting, daylighting, natural ventilation, shading, envelope optimization, and reflective roofs. The energy use factors were adjusted to reflect the energy efficiency performance target to reduce energy consumption below 2008 Title 24 standards and were used to estimate the energy that would be used by building envelopes, which are governed by Title 24. The energy consumption by non-residential uses (except for the proposed stadium) was estimated based on data from the Climate Change Technical Report included in Appendix S of the CP-HPS DEIR (SFRA 2009).

Plug-in energy use (appliances, office equipment, plug-in cooking equipment, electronics, and other plug-in loads) is not governed under Title 24 standards. Plug-in energy use is largely beyond the control of the future developer or owner of the property, as most plug-in equipment would be installed by future occupants. However, ENERGY STAR appliances would be installed in new residences (for builder-supplied appliances) as an energy-saving measure. Because it is not clear which appliances would be chosen, the decrease in plug-in electricity use associated with ENERGY STAR appliances cannot be quantified at this time. Therefore, plug-in energy use is discussed qualitatively.

Projected petroleum fuel use associated with vehicle trips was estimated by multiplying the VMT from the *Candlestick Point-Hunters Point Shipyard Phase II Development Plan Transportation Study* (SFRA 2009, Appendix D) and average fuel efficiencies for San Francisco. The analysis considers the TDM programs and programs designed to shift trips to other modes of transportation in the analysis of the overall energy efficiency.

4.10.2 Alternative 1: Stadium Plan Alternative

4.10.2.1 Construction Impacts

4.10.2.1.1 Factors 1 and 2: Water

The Draft Infrastructure Plan for Alternative 1 includes a low-pressure water system, a recycled water system, an AWSS, separate sanitary sewer, and storm drainage facilities (Appendix N). The impacts of constructing these facilities are addressed for each of the other resource areas in other sections of Chapter 4, Environmental Consequences. The water required for construction activities would be supplied by water trucks and/or existing sources. These sources would be adequate to meet demands during construction activities, and new or expanded entitlements and resources would not be required. Therefore, *no impacts* would occur with construction of water conveyance or treatment infrastructure associated with Alternative 1 and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1 would not impact water resources, and *no impacts* to water would occur.

4.10.2.1.2 Factors 3 and 4: Wastewater

Impacts associated with constructing wastewater facilities for Alternative 1, including demolition and installation of new utility infrastructure, are addressed for each of the other resource areas in other sections of Chapter 4, Environmental Consequences. Construction of Alternative 1 would not increase flows beyond the current capacity of the wastewater treatment system or cause exceedances to the discharge permit. *No impacts* beyond those identified in those sections would occur with construction of wastewater conveyance or treatment infrastructure associated with Alternative 1 and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not impact wastewater treatment or collection facilities, and *no impacts* to wastewater would occur.

4.10.2.1.3 Factors 5 and 6: Solid Waste

Proposed construction activities, including demolition of existing facilities, would not generate construction-related solid waste that would exceed the capacity of landfills serving the City and County of San Francisco.

Construction debris would be generated by the demolition and removal of existing structures and utility infrastructure within the project site and the construction of new structures and infrastructure. Alternative 1 is estimated to generate 547,104 tons (496,322 megagrams [Mg]) of construction debris (Table 4.10.2-1). Some construction and demolition debris would be reused onsite (e.g., existing asphalt in parking areas would be removed, crushed, reconditioned, and reused as base material for new roadways and parking lots), while other materials would be transported offsite for separation. Materials that cannot be reused or recycled would likely be transported to the Altamont Landfill. At a 75 percent diversion rate, an estimated 136,776 tons (124,080 Mg) would be transported to the landfill.

Table 4.10.2-1. Alternative 1 Estimated Demolition Debris

	Concrete/ Asphalt[a] (tons)	*Wood[b] (tons)*	*Steel[c] (tons)*	*Misc. Debris[d,e] (tons)*	*Total[f] (tons)*
Building Demolition	179,652	137,572	74,480	86,119	477,823
Road Demolition	36,950	0	0	32,331	69,281
Subtotal	**216,602**	**137,572**	**74,480**	**118,450**	**547,104**

Notes:

a. Concrete/asphalt debris can be sized and recycled onsite as pipe bedding or road base.
b. Wood debris can be chipped and sent to the local landfill for disposal.
c. Scrap steel can be recycled offsite.
d. Miscellaneous debris including glass, asphalt, plastic, etc. would be transported and disposed of at a local landfill.
e. Asphalt included in Miscellaneous Debris may be recycled.
f. Quantity estimates are approximate. Pre-demolition surveys need to be performed to confirm size of structures and building material types.

Source: Lennar Urban 2009a.

The remaining capacity of the Altamont Landfill, as of August 2009, is 45.7 million yd^3 (35.2 million m^3). The estimated 136,776 tons (124,080 Mg) of construction waste is equivalent to 136,776 yd^3 (105,212 m^3) at an average density of 1 ton (0.90718 Mg) per yd^3. This represents 0.3 percent of the available remaining capacity in the Altamont Landfill.

At current disposal rates, the Altamont Landfill would be expected to reach capacity in January 2032; however, its permit expires three years earlier, in January 2029 (CIWMB 2009a). Most of the demolition activities, which generate construction debris, are expected to conclude in 2028, one year before the landfill is expected to close. The future developer or owner of the property would prepare a Site Waste Management Plan (SWMP) that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). Therefore, impacts would be *not significant* and no mitigation is proposed.

Hazardous Waste

Construction activities at HPS, including demolition and excavation, could require disposal of hazardous wastes such as asbestos, lead-based paint, and contaminated soils. These would require disposal by a licensed transporter to a TSD facility authorized to treat such hazardous waste. Disposal of these wastes would occur intermittently as construction occurs over a 20-year period, and would not likely represent a substantial amount of hazardous waste in a given year. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all hazardous wastes potentially generated by Alternative 1. Any hazardous waste associated with construction activities would be disposed of in compliance with federal, state, and local regulations. Please refer to Section 4.7, Hazards and Hazardous Substances, for information regarding remediation efforts.

Because the TSDs in California and adjoining states have sufficient capacity to treat hazardous wastes, Alternative 1 would not generate hazardous wastes (construction debris or contaminated soil) in amounts that would exceed the capacity of authorized TSDs. This impact would be *not significant*, and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not impact solid waste facilities, and impacts would be *not significant*.

4.10.2.1.4 Factors 7, 8, and 9: Energy and Telecommunications

Proposed improvements at the project site include the construction of a joint trench for electrical, natural gas, cable TV, and telecommunications. In addition, the joint trench would include conduits and conductors for street lighting and traffic signals. The power supplier may service the project via new extensions of the 12 kilovolt (kV) distribution and/or 115 kV transmission lines into the project site. This could include a new substation within the project site. Impacts of construction activities associated with Alternative 1, including demolition and installation of new energy and telecommunications infrastructure, are addressed for each of the other resource areas in other sections of Chapter 4, Environmental Consequences. No new construction impacts beyond those identified in those sections would occur with construction of utility infrastructure associated with Alternative 1.

Alternative 1 construction activities would not result in demands for fuel greater than any other similarly sized projects in the region. Although Alternative 1 would be large, it would be constructed over a period of approximately 20 years, and demands for electricity and fuels would be spread out over this timeframe. Alternative 1 has been divided into construction phases; each of these phases is comparable to similar projects in terms of activity types, duration, land use, development area, and fuel consumption. Therefore, construction-related energy use associated with Alternative 1 would not be large or wasteful and the impact is considered *not significant.* No mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not impact energy and telecommunications infrastructure, and impacts would be *not significant*.

4.10.2.2 Operational Impacts

4.10.2.2.1 Factors 1 and 2: Water

The existing Regional Water System would be expected to have sufficient capacity to meet any future water supply demands resulting from implementation of Alternative 1. Subsequent to transfer of HPS to the city, the city and SFPUC would be responsible for upgrading, managing, and operating onsite water infrastructure.

Water Demand

Buildout of Alternative 1 would result in 2,650 residential units and approximately 2,930,000 ft^2 (272,206 m^2) of non-residential development. Based on the density of development at full buildout, Alternative 1 would require water at a rate of approximately 0.7 MGD (2.6 ML/d) (Table 4.10.2-2). This is in excess of existing baseline conditions of 0.3 MGD (1.1 ML/d). Although the project site would have increased water demands, water usage would be reduced through implementation of environmental controls to minimize water consumption (Section 2.3.2.1.9, Environmental Controls).

Table 4.10.2-2. Alternative 1 – Projected Annual Water Demand

	Existing Baseline Conditions (MGD)	*Buildout/Full Occupancy (2032) (MGD)*
Water Demand	0.3	0.7
Net Change	N/A	+ 0.4

Source: Appendix Q2 of the CP-HPS DEIR (SFRA 2009).

Implementation of Alternative 1 would not be expected to have a significant impact on the future capacity of the Regional Water System. The SFPUC forecasts that total retail demand, including project-related demand, is projected to increase from 91.81 MGD (347.5 ML/d) in 2010 to 93.42 MGD (353.6 ML/d) in 2030 (refer to Appendix G). The existing Regional Water System currently allocates approximately 81 MGD (307 ML/d) to retail customers. An additional 3.5 MGD (13 ML/d) of groundwater is provided from local groundwater basins and (after 2015) 10 MGD (38 ML/d) could be provided from additional groundwater and recycled water projects, and from conservation measures that reduce demand (i.e., conservation supply). Buildout of Alternative 1 would result in a projected demand of approximately 0.7 MGD (2.6 ML/d) (a net increase of approximately 0.4 MGD [1.5 ML/d] over baseline conditions). At the time of the first phase of project implementation (i.e., after 2015), SFPUC projects that adequate supply would be available to satisfy all retail demands, including project-related demand, under normal conditions (SFRA 2009, Appendix Q2).

A comparison of total retail water supply to estimated water demand shows that after 2030, during multiple dry-year periods, the total retail water supply would be slightly less than estimated total demands, including demands associated with Alternative 1 (Appendix G). However, implementation of regional system improvements (i.e., Water Shortage Allocation Plan and Retail Water Shortage Allocation Plan water conservation strategies) during multiple dry-year periods would ensure projected future water supplies could accommodate estimated future water demands, including Alternative 1 demands. Therefore, Alternative 1 would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements. Impact to water utilities would be *not significant* and no mitigation is proposed.

Distribution Systems

Alternative 1 would require upgrading and expansion of the existing water supply infrastructure at HPS, including construction of a low pressure water system, recycled water system, and AWSS. Under this alternative, a low pressure water system would be installed to accommodate potable water and AWSS (fire protection) demands. The low pressure water system would deliver water supplied by the Regional Water System through connections to the city's University Mount Pressure Zone at two locations: 1) Palou Ave and Griffith St; and 2) Innes Ave and Earl St. No improvements to the city's water system between these two connection points and the University Mound Reservoirs would be required. The proposed distribution system would consist of 16-in (0.41 m) pipelines from the connection points and 12-in (0.30 m) pipelines throughout the project site. Valves, blow-offs, meters, and other appurtenances would be constructed as necessary to meet system operational requirements. Final design of this system would require municipal review and approval and would comply with applicable local codes, ordinances, and regulations. Upon approval of the low pressure water system by the city, the SFPUC would assume responsibility for the operation and maintenance of all facilities.

Alternative 1 recycled water demands would be served by the proposed recycled water system. Since the city currently does not have an operational recycled water source, this system would be supplied by the city's potable water distribution system via temporary connections until a recycled water supply is developed by the city. In the event a city recycled water supply is constructed, the city would disconnect the temporary low pressure water system connections and connect the recycled water mains to the city's recycled water system. Final design of this system would require municipal review and approval and would comply with applicable local codes, ordinances, and regulations. Upon approval of the recycled water system by the city, the SFPUC would assume responsibility for the operation and maintenance of all facilities.

Alternative 1 would require the expansion of an AWSS to provide adequate water supply for fire protection at the project site. Under Alternative 1, the SFFD would extend the existing AWSS along

Crisp Rd from the Ingalls St/Revere Ave intersection to the project boundary and along Evans Ave, Hunters Point Blvd, Innes Ave, and Donahue St from the intersection of Keith St and Evans Ave to the project boundary. A looped service along Spear Ave/Crisp Rd, a second loop in Inner Ring Rd around the Stadium Pad, and several mains extending from this loop would be connected to the AWSS extensions. Upon approval of the AWSS by the city, the SFFD would assume responsibility for the operation and maintenance of all facilities. This AWSS would ensure the provision of adequate water for onsite fire-fighting purposes, and the project site would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements for water or fire protection.

Alternative 1 would not require or result in the construction of new or expanded water treatment facilities. Therefore, impacts would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of the Tower Variant D for Alternative 1, would not require water supplies in excess of existing entitlements or result in the construction of new or expanded water treatment facilities, and impacts would be *not significant*.

4.10.2.2.2 Factors 3 and 4: Wastewater

Implementation of Alternative 1 would not require expansion of existing offsite wastewater conveyance facilities. Subsequent to transfer of HPS to the city, the city would be responsible for upgrading, managing, and operating onsite wastewater and storm drainage infrastructure.

Wastewater Demands

Alternative 1 would consist of four development districts within HPS with a variety of land uses, including residential, neighborhood retail, R&D, artists' studios/art center, community services, stadium, marina, parking, parks, and open space. Based on the density of development at full buildout, Alternative 1 would generate 0.6 MGD (2.3 ML/d) of wastewater flows (Table 4.10.2-3).

Table 4.10.2-3. Alternative 1 – Projected Wastewater Generation (MGD)

	Existing Baseline Conditions	***Buildout/Full Occupancy (2032)***
Wastewater Demand	0.154	0.6
Net Change	N/A	+ 0.446
Source: Appendix Q2 of the CP-HPS DEIR (SFRA 2009).		

Wastewater flows from the project site would be transported via the new or expanded conveyance systems within HPS and existing mains to the SWPCP (Winzler and Kelly 2009). Wastewater from the project site flows into the Hunters Point tunnel sewer, which has an existing maximum peak flow of 12,501 GPM. Under Alternative 1, projected maximum peak flows would be 979 GPM (3,706 liters/minute) (Table 4.10.2-4). As the Hunters Point tunnel sewer would have a remaining capacity of 69,853 GPM (264,394 liters/minute) during peak dry-weather flow conditions, the addition of 979 GPM (3,706 liters/minute) peak flow from proposed development would be accommodated within the remaining capacity of the Hunters Point tunnel sewer. Therefore, no expansion of the existing offsite conveyance infrastructure would be required to accommodate dry-weather flows from proposed development. As the existing conveyance infrastructure could accommodate the additional flows from proposed development in addition to existing flows, even during periods of peak flow conditions, impacts would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Table 4.10.2-4. Alternative 1 Sewer Trunk Capacity and Maximum Peak Flows

Sewer Trunk	Design Capacity (GPM)	Existing Average Dry-Weather Flow[a] (GPM)	Existing Maximum Peak Dry-Weather Flow[b] (GPM)	Alternative 1 Contribution – Maximum Peak Dry-Weather Flow[c] (GPM)	Remaining Peak Flow Capacity (GPM) With Alternative 1
Hunters Point tunnel sewer	83,333	4,167[d]	12,501[d]	979	69,853[e]

Notes:

a. Calculated as existing average dry-weather flow in MGD/24 hours/60 minutes x 1,000,000.
b. Calculated as existing average flow in GPM x peaking factor of 3.0.
c. Calculated as proposed average dry-weather flow in MGD/24 hours/60 minutes x 1,000,000 x peaking factor of 3.0.
d. These flows are *inclusive* of flows from the Candlestick tunnel sewer.
e. Calculated as design capacity less existing maximum peak flow less Alternative 1 maximum peak flow, all in GPM. This calculation does NOT take credit for the existing uses on the HPS site that would be demolished that currently contribute wastewater flows to the Hunters Point tunnel sewer. Therefore, the actual remaining peak flow capacity of the Hunters Point tunnel sewer with the proposed action would be somewhat greater than 69,853 GPM.

Source: SFPUC 2002.

While Alternative 1 development would not contribute stormwater to the Combined Sewer System, wastewater discharges during wet weather would combine with offsite, wet-weather flows and contribute to overall wet-weather discharge volume in the system. If wet-weather volumes were to exceed the capacities of the available conveyance facilities, a CSO could occur. However, construction of proposed separate wastewater and stormwater systems at the project site would result in a decrease in CSO volume, frequency, and duration of CSO in the Yosemite Basin and a decrease in overall CSO volume for the entire Bayside Drainage Area because stormwater from the project site would no longer flow into the Combined Sewer System. The proposed diversion of wet-weather flows away from the combined system would offset the increase in dry-weather flows. In addition, the future developer or owner of the property would ensure there would be no increase in CSO flows as a result of Alternative 1 by providing temporary detention or retention of wastewater onsite during wet weather or completion of the separate stormwater and wastewater systems (Section 2.3.2.1.9, Environmental Controls). The impact on the wastewater conveyance and treatment system would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not require expansion of existing wastewater conveyance facilities and impacts would be *not significant*.

4.10.2.2.3 Factors 5 and 6: Solid Waste

Solid Waste and Permitted Landfill Capacity

Proposed development operations would generate 8,745 tons (7,933 Mg) of solid waste annually when all uses are fully operational and assuming no waste reduction measures (Table 4.10.2-5). This would represent 1.4 percent of the total waste generated in San Francisco in 2008 (594,732 tons [539,529 Mg]). The city has implemented a number of aggressive strategies to divert additional solid waste and achieve citywide diversion goals. The city plans to achieve a 75 percent landfill diversion by 2010 and full (100 percent) waste diversion by 2020. In 2008, the city achieved 72 percent landfill diversion.

Under Alternative 1, recycling, composting, and trash facilities would be provided as required by city specifications. In addition, consistent with the city's goal of achieving zero waste by 2020, the future developer or owner of the property would prepare a SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls).

Table 4.10.2-5. Alternative 1 - Solid Waste Generation

Use	Generation Factor (per day)	Alternative 1		
		Area or Units	Tons per Day or Event	Tons per Year
Residential	5.653 lbs/unit	2,650 units	7.5	2,737.5
Retail	0.02600411 lbs/ft^2	125,000 ft^2	1.6	584.0
Office	0.006 lbs/ft^2	0	0	0
Hotel	0.0108 lbs/ft^2	0	0	0
R&D	0.006 lbs/ft^2	2,500,000 ft^2	7.5	2,737.5
Performance Venue	2.23 lbs/seat	0	0	0
Stadium	2.23 lbs/seat	65,550 seats	73.1	2,339.2
Artists' Studios/Art Center	0.006 lbs/ft^2	255,000 ft^2	0.8	292
Community Facilities	0.006 lbs/ft^2	50,000 ft^2	0.15	54.8
			Total	**8,745**

Under Alternative 1, recycling, composting, and trash facilities would be provided as required by city specifications. In addition, consistent with the city's goal of achieving zero waste by 2020, the future developer or owner of the property would prepare a SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls).

The Altamont Landfill is scheduled to close in January 2029, prior to full build-out of Alternative 1, and the city's existing contract with Altamont Landfill expires in 2014, before build-out of Alternative 1. Three landfills have been identified as candidates to accommodate the city's solid waste needs after the contract with Altamont Landfill expires. As a primary course of business, the city would continue to ensure that solid waste can be disposed of through new contracts or reinstated contracts with solid waste disposal facilities and through aggressive waste minimization efforts. In addition, the future developer or owner of the property would prepare an SWMP that would provide specific strategies to ensure that Alternative 1 reduces solid waste disposed of in landfills in a manner consistent with the city's goal of achieving zero waste by 2020 (Section 2.3.2.1.9, Environmental Controls). With implementation of environmental controls, the impact of operational solid waste generated by Alternative 1 on the capacity of the Altamont Landfill (and/or the landfill with which the city contracts at the close of the current selection process) would be *not significant*.

Hazardous Waste Generation

The specific businesses or activities that could operate under Alternative 1 are not known at this time. Accordingly, the precise amount of additional hazardous materials associated with new uses cannot be determined at this stage of development. Therefore, it is assumed that a variety of hazardous materials could be used, although the uses proposed under Alternative 1 would not include Large-Quantity Generators (more than 600 lbs (272 kg) of hazardous waste generation per month). Under Alternative 1, individual entities would not likely generate more than 60 lbs (27 kg) of hazardous waste per month.

Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all anticipated hazardous wastes. Since no industrial uses are proposed under this alternative, the amount of hazardous wastes that would be generated would be minimal, consisting primarily of household hazardous waste. All hazardous waste disposal would be conducted in compliance with federal, state, and local regulations. Because the minimal amount of hazardous waste generated by Alternative 1 could be accommodated by existing facilities, this impact would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Compliance with Solid Waste Regulations

Development within the project site would meet or exceed all of the city's solid waste diversion requirements for new development. The future developer or owner of the property would be required to provide an SWMP demonstrating the manner in which the project would comply with these requirements (Section 2.3.2.1.9, Environmental Controls). Under Alternative 1, recycling facilities for residents and commercial and retail tenants would be provided. With implementation of environmental controls, development of Alternative 1 would not conflict with regulatory policies pertaining to solid waste and this impact would be *not significant*.

Minor changes to the project footprint, associated with operation of the Tower Variant D for Alternative 1, would not impact solid waste and permitted landfill capacities or conflict with solid waste regulatory policies, and impacts would be *not significant*.

4.10.2.2.4 Factors 7, 8, and 9: Energy and Telecommunications

A service provider for electricity has not yet been selected. Ownership of the electric power distribution system on HPS would transfer to the service provider following disposal of the project site. Prior to transfer, the service provider would identify any improvements required to bring the distribution system up to local standards.

Alternative 1 would construct a joint trench network for proposed development that would include electrical, communications, and gas utilities. In addition, the joint trench would include conduits and conductors for street lighting and traffic signals. Major and minor joint trenches would be routed through the street network to provide power, communications, and gas facilities to the development areas.

Under Alternative 1, it is anticipated that at full buildout (2032), proposed development would require 44 MW of electricity, which includes the load assumption for the stadium, as well as a number of energy-efficiency and low-energy design measures presented in Appendix Q2 of the CP-HPS DEIR (SFRA 2009). Alternative 1 would require upgrades to the existing connection to the grid. The electricity provider may service the project site via new extensions of the 12kV distribution and/or 115kV transmission lines into the project site, and improvements could include a new substation within HPS. Although Alternative 1 would result in an increase in electricity demand in the city, an energy efficiency performance target has been set at 15 percent below 24 CCR energy-conservation standards. Further, implementation and extension of utility infrastructure would be fully funded and constructed by the future developer or owner of the property. The proposed Draft Infrastructure Plan identifies all needed upgrades to the distribution system, including installation of new transformers, additional distribution lines, switches, and/or potentially an electrical substation (Appendix N). The Draft Infrastructure Plan would be subject to the approval of the city to ensure that adequate capacity is provided to accommodate the project. All utility connections would be constructed to ensure an adequately sized and properly constructed electrical transmission and conveyance system.

Energy Use in Large Amounts or a Wasteful Manner

Table 4.10.2-6 presents the estimated electricity use for plug-in appliances. Alternative 1 would require 35,948 Megawatt hours (MWh) of electricity annually to supply plug-in appliances. Because plug-in electricity use depends on the appliances installed by future residents and employees, plug-in consumption would be difficult for the future developer or owner of the property to influence. However, installation of ENERGY STAR appliances into new residential units would result in a small decrease in plug-in energy use below the numbers shown in Table 4.10.2-6.

Table 4.10.2-6. Alternative 1 Electricity Demand from Plug-In Appliances (MWh)			
Type of Use	***Energy Use Factor (MWh/gft² or unit)[a]***	***Alternative 1***	
		Development Program	*MWh Consumed Annually*
Residential Units	1.7830[b]	2,650	4,725
Retail	0.0096	—	—
Neighborhood Retail	0.0096	125,000	1,196
Office	0.0093	—	—
R&D	0.0093	2,500,000	23,125
Hotel	0.0069	—	—
Artists' Studios/Art Center	0.0093	255,000	2,359
Community Space	0.0093	50,000	463
Arena	0.0073	—	—
Stadium	N/A	1,860,000	4,080
		Total	**35,948**
		Percent of Total	**60%**

Notes:

a. The electricity factors cited for non-residential uses are from: Table 3-16 (SFRA 2009). The factors are in the "Non-Title 24" column. The factors were converted from kWh to MWh.

b. The electricity factor cited for residential units is from: Table 3-8 (SFRA 2009). The factor is in the "Plug-in" column and the "Minimally Title 24 Compliant (2008)" row. The factor was converted from kWh to MWh (1 MWh = 1,000 kWh).

Source: Appendix S of the CP-HPS DEIR (SFRA 2009).

Table 4.10.2-7 presents the projected electricity demand associated with building envelope design. The projected demand incorporates energy savings associated with designing and constructing Alternative 1 to reduce energy demands to 15 percent below 2008 Title 24 standards.

Table 4.10.2-7. Alternative 1 Electricity Demand from Building Envelopes				
Type of Use	***Electricity Use Factor, 2008 Title 24 Standards (MWh/gft² or unit)[a]***	***Alternative 1***		
		Development Program	*MWh Consumed Annually, Title 24 Standards*	*MWh Consumed Annually, with 15% Reduction*
Residential Units	1.7350[b]	2,650	4,598	3,908
Retail	0.0027	—	0	0
Neighborhood Retail	0.0027	125,000	338	287
Office	0.0052	—	0	0
R&D	0.0052	2,500,000	13,000	11,050
Hotel	0.0027	—	0	0
Artists' Studios/Art Center	0.0052	255,000	1,326	1,127
Community Space	0.0052	50,000	260	221
Arena	0.0015	—	0	0
Stadium	N/A	1,860,000	4,080	4,080
		Total	**23,602**	**20,673**

Notes:

a. The energy use factor cited for residential units is from: Table 3-8 (SFRA 2009). The factor was derived by subtracting the "Plug-in" factor from the "Electricity Delivered, Total" column (in the "15% Better than Title 24 2008 and ENERGY STAR Appliances" row). The factor was converted from kWh to MWh (1 MWh = 1,000 kWh).

b. The electricity factors cited for non-residential uses are from: Table 3-16 (SFRA 2009). The factors are in the "Non-Title 24" column. The factors were converted from kWh to MWh.

Sources:

Appendix S of the CP-HPS DEIR (SFRA 2009).

Alternative 1 electricity demand was estimated based on the energy efficiency performance target of 15 percent energy reductions below Title 24 standards and the use ENERGY STAR appliances in new residential units.

The threshold for this impact considers whether Alternative 1 would result in a large increase in electricity consumption. The electricity use at the project site, following implementation of energy efficiency measures, would represent less than 2 percent of the city's total electricity consumption of 5,155 million kWh, and would result in an increase over the existing electricity use of 9,457 MWh at the project site. This would be a large overall increase in consumption because much of the site currently is unoccupied and undeveloped. However, on a per-square-foot basis, Alternative 1 would result in 15 percent less electricity use than projects that comply with minimum Title 24 requirements only.

In addition, Alternative 1 would comply with the city's Green Building Ordinance. The Green Building Ordinance requires newly constructed commercial buildings over 5,000 gft^2 (465 gm^2), residential buildings over 75 ft (23 m) in height, and renovations on buildings over 25,000 gft^2 (2,323 gm^2) to meet LEED® or other green building standards. Individual buildings would incorporate various green building specifications to meet the Green Building Ordinance and, in some cases, seek LEED® certification, or an equivalent certification for these buildings. While specific Green Building Ordinance measures cannot be identified until building designs have been completed, examples of measures that could be implemented include high performance glazing, efficient lighting, daylighting, shading, envelope optimization, reflective roofs, and natural ventilation (reducing energy use for heating and cooling). In addition, proposed buildings would be constructed to LEED® for Neighborhood Development (LEED® ND) Gold standards, which apply principles of smart growth, urbanism, and green building into a certification system for overall neighborhood design. Although additional energy savings associated with implementation of the city's Green Building Ordinance and the LEED® ND standards cannot be modeled until designs have been completed, these measures could further decrease the energy consumption presented in Table 4.10.2-7.

To reduce peak demand on existing electricity infrastructure, renewable energy strategies, such as the use of photovoltaic cells to provide electricity, the use of solar thermal energy to provide space cooling with the use of absorption systems, and/or water for space heating and domestic water systems would be implemented.

Alternative 1 would result in building envelope consumption of at least 15 percent less electricity than a project that would not implement such measures. Further electricity savings would be anticipated as a result of compliance with the Green Building Ordinance, installation of ENERGY STAR appliances, and the project's voluntary implementation of LEED® ND standards. Therefore, implementation of energy reductions and voluntary green building practices (beyond the measures required in the city's Green Building Ordinance) would reduce electricity consumption impacts to *not significant*. Since impacts would not be significant, no mitigation is proposed.

NATURAL GAS USE

Redevelopment under Alternative 1 could require the expansion or relocation of natural gas lines on the project site to accommodate the final design at full buildout. All natural gas connections would be constructed to ensure an adequately sized and properly constructed natural gas transmission and conveyance system. Further, implementation and extension of utility infrastructure would be fully funded and constructed by the future developer or owner of the property. The Draft Infrastructure Plan contains a comprehensive description of all natural gas distribution upgrades required by the proposed action, as well as the specific locations of all connections. The Draft Infrastructure Plan would be subject to the approval of the city prior to the issuance of development permits (Appendix N).

Table 4.10.2-8 presents the annual natural gas usage for Alternative 1 based on land use and minimal compliance with Title 24 standards as well as the energy efficiency performance target of reducing natural gas usage 15 percent below the standards stipulated in the 2008 24 CCR. The annual natural gas demand associated with Alternative 1 would be 54,966 MBtu.

Table 4.10.2-8. Alternative 1 Natural Gas Demand				
Type of Use	Natural Gas Use Factor, 2008 Title 24 Standards (MWh/gft^2 or unit)[a]	Alternative 1		
		Development Program	MBtu Consumed Annually, 2008 Title 24 Standards	MBtu Consumed Annually, with 15 Percent Reduction
Residential Units	0.0360[b]	2,650	95	81
Retail	0.0048	—	—	—
Neighborhood Retail	0.0048	125,000	600	510
Office	0.0200	—	—	—
R&D	0.0200	2,500,000	50,000	42,500
Hotel	0.0345	—	—	—
Artists' Studios/Art Center	0.0200	225,000	4,500	3,825
Community Space	0.0200	50,000	1,000	850
Arena	0.0243	—	—	—
Stadium	N/A	1,860,000	7,200	7,200
		Total	**63,395**	**54,966**

Notes:

a. The natural gas factors cited for non-residential uses are from: Table 3-16 (SFRA 2009). The factors are in the "Overall Based on 2008 Title 24" column. The factors were converted from kBtu to MBtu.

b. The natural gas factor cited for residential units is from: Table 3-8 (SFRA 2009). The factor is in the "Natural Gas Delivered, Total" column and the "Minimally Title 24 Compliant (2008)" row. The factor was converted from kBtu to MBtu (1 MBtu = 1,000 kBtu).

Sources:

Appendix S of the CP-HPS DEIR (SFRA 2009).

Baseline proposed action natural gas demand was estimated based on land use and basic compliance with 2008 Title 24 standards.

Annual natural gas demands at the project site (54,966 MBtu) would represent less than 1 percent of the city's overall natural gas consumption of 28,918,000 MBtus. Overall natural gas demands would be approximately four times higher than under existing conditions, which is largely attributable to R&D uses at the project site. However, on a per-square-foot basis, Alternative 1 would result in 15 percent less natural gas demands than projects that comply with minimum Title 24 requirements only.

Alternative 1 would comply with the city's Green Building Ordinance and would construct buildings to the LEED® ND Gold standard, which would result in additional energy savings beyond those shown in Table 4.10.2-3. Although plug-in energy use (appliances, office equipment, plug-in cooking equipment, electronics, and other plug-in loads) is not governed under Title 24 standards, ENERGY STAR appliances are proposed for new residential units. Such measures would reduce natural gas consumption impacts to *not significant*.

PETROLEUM FUEL USE

Alternative 1 would increase trips to and from the project site, increasing the use of petroleum fuels. Based on average fuel efficiencies for the City of San Francisco and Alternative 1 VMT (reported in the *Candlestick Point-Hunters Point Shipyard Phase II Development Plan Transportation Study,* provided in Appendix D of the CP-HPS DEIR [SFRA 2009]), Alternative 1 would result in a demand for 14.01 million gallons (53.03 million liters) of gasoline and 0.93 million gallons (3.5 million liters) of diesel annually (Table 4.10.2-9).

Table 4.10.2-9. Alternative 1 Petroleum Demand					
	Alternative 1 Annual VMT (million miles traveled) [a]	***Average Countywide Vehicle Fuel Efficiency (2030)*** [b]	***Alternative 1 Total Fuel Consumption (million gallons)***	***Alternative 1 Gasoline Consumption (million gallons)*** [c]	***Alternative 1 Diesel Consumption (million gallons)*** [c]
Hunters Point Shipyard	92.36	21.15	4.37	4.09	0.27

Notes:

a. Annual VMT was calculated by PBS&J based on trip generation information and average trip lengths reported in: CHS Consulting Group, *et al*. 2009.

b. Equals the projected 2030 VMT (3,495 million miles traveled) divided by the projected total transportation fuel consumed (171.27 million gallons) for San Francisco County, as reported in: Caltrans 2009. This factor does not take into account recently adopted fuel efficiency standards.

c. On average 94 percent of the transportation fuels consumed in San Francisco were gasoline fuels, while 6 percent were diesel fuels, as reported in Caltrans2009.

Sources:

CHS Consulting Group, *et al*. 2009.

Caltrans 2009.

The use of fuels resulting from project-related vehicle trips to and from the project site would be five times higher than under existing conditions, which would be a large increase in consumption. However, this consumption would not be wasteful because Alternative 1 would: 1) minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements that would encourage alternative travel modes; 2) include a TDM program designed to reduce the remaining vehicle trips; and 3) result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as overall trip lengths. Proposed design features and programs that would increase the efficiency of transportation activities associated with Alternative 1 are described in Section 4.1, Transportation, Traffic, and Circulation.

In summary, the programs proposed under Alternative 1 for minimizing vehicle trips, as well as the project's density, mix of uses, and overall physical layout, would minimize the total amount of fuel consumed by shortening trip lengths and shifting trips from vehicular modes of travel. However, because project site plans are in the preliminary design stage, mitigation measures are included in Section 4.1, Transportation, Traffic, and Circulation, which require implementation of specified circulation improvements to minimize VMT. Implementation of these mitigation measures would ensure impacts would be *not significant*.

TELECOMMUNICATIONS

Telecommunications providers are "on-demand" services, generally expanding their systems in response to demand, and would be expected to provide extensions of existing infrastructure to the project site as required. Telecommunications and cable services would be supplied by any one of a number of providers in the San Francisco area. The service providers would provide any needed upgrades to their distribution systems, including new switching and routing equipment, to accommodate the demand. Such extensions would require minimal trenching, if any, and would not result in significant impacts beyond those previously identified. Therefore, impacts would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not exceed utility service capacities or result in wasteful electricity consumption, and impacts would be *not significant*.

4.10.3 Alternative 1A: Stadium Plan/No-Bridge Alternative

4.10.3.1 Construction Impacts

4.10.3.1.1 Factors 1 and 2: Water

Alternative 1A would be the same as Alternative 1 except that the Yosemite Slough bridge would not be constructed. Under Alternative 1A, impacts on water during construction would be the same as those described for Alternative 1 in Section 4.10.2.1.1. *No impacts* on water would occur and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not impact water resources, and *no impacts* would occur.

4.10.3.1.2 Factors 3 and 4: Wastewater

Impacts on wastewater from construction of Alternative 1A would be the same as those described for Alternative 1 in Section 4.10.2.1.2. *No impacts* on wastewater would occur and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not impact wastewater treatment or collection facilities, and *no impacts* would occur.

4.10.3.1.3 Factors 5 and 6: Solid Waste

Under Alternative 1A, impacts on solid waste during construction would be similar but slightly less than those described for Alternative 1 in Section 4.10.2.1.3, due to elimination of the Yosemite Slough bridge. Construction waste would be sorted, prior to disposal, to ensure that all recyclable materials are salvaged from the waste that is ultimately taken to a landfill. In addition, the future developer or owner of the property would prepare an SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). With implementation of environmental controls, impacts to solid waste during construction would be *not significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not impact solid waste facilities, and impacts would be *not significant*.

4.10.3.1.4 Factors 7, 8, and 9: Energy and Telecommunications

Impacts on energy and telecommunications from construction of Alternative 1A would be the same as described for Alternative 1 in Section 4.10.2.1.4. Although Alternative 1A would not result in construction of the Yosemite Slough bridge, impacts on energy and telecommunications would be the same for both alternatives. Impacts on energy and telecommunications would be *not significant*. As impacts on energy and telecommunications would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not impact energy and telecommunications infrastructure, and impacts would be *not significant*.

4.10.3.2 Operational Impacts

4.10.3.2.1 Factors 1 and 2: Water

Although the Yosemite Slough bridge would not be constructed, Alternative 1A would have the same land use plan, including infrastructure improvements, as Alternative 1. Impacts on water from Alternative 1A operations would be the same as described for Alternative 1 in Section 4.10.2.2.1. Similar to Alternative 1, this alternative would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements, or require construction of new or expanded water treatment facilities. Extension of the existing AWSS and construction of a loop service would ensure adequate water supplies for onsite fire protection. Therefore, impacts on water would be *not significant*. As impacts on water would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not require water supplies in excess of existing entitlements or result in the construction of new or expanded water treatment facilities, and impacts would be *not significant*.

4.10.3.2.2 Factors 3 and 4: Wastewater

Impacts on wastewater during Alternative 1A operations would be the same as described for Alternative 1 in Section 4.10.2.2.2. Existing conveyance infrastructure could accommodate the additional flows from proposed development in addition to existing flows, and expansion of offsite wastewater conveyance infrastructure would not be required. Similar to Alternative 1, the future developer or owner of the property would ensure no increase in CSO flows as a result of Alternative 1A by providing temporary detention or retention of wastewater onsite during wet weather or completion of the separate stormwater and wastewater systems (Section 2.3.2.1.9, Environmental Controls). Therefore, with implementation of environmental controls, impacts on wastewater would be *not significant*.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not require expansion of existing wastewater conveyance facilities or result in the exceedance of applicable RWQCB wastewater treatment requirements, and impacts would be *not significant*.

4.10.3.2.3 Factors 5 and 6: Solid Waste

Impacts on solid waste from Alternative 1A operations would be the same as described for Alternative 1 in Section 4.10.2.2.3. Recycling, composting, and trash facilities would be provided as required by city specifications. In addition, the future developer or owner of the property would prepare an SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). Solid waste generated by Alternative 1A operations would not substantially contribute to the capacity of Altamont Landfill (and/or other regional solid waste facilities). The minimal amount of hazardous waste generated by Alternative 1A could be accommodated by existing facilities. Therefore, with implementation of environmental controls, impacts on solid waste would be *not significant*.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not impact solid waste and permitted landfill capacities or conflict with solid waste regulatory policies, and impacts would be *not significant*.

4.10.3.2.4 Factors 7, 8, and 9: Energy and Telecommunications

Impacts on energy and telecommunications during Alternative 1A operations would be the same as described for Alternative 1 in Section 4.10.2.2.4. Alternative 1A would include the same infrastructure improvements, including a joint trench network that would include electrical, communications, and gas utilities, as Alternative 1. All utility connections would be constructed to ensure an adequately sized and properly constructed electrical transmission and conveyance system. As Alternative 1A has the same land use plan as Alternative 1, demands on energy (electricity, natural gas, and petroleum fuel) and telecommunications would be similar. Alternative 1A would comply with the city's Green Building Ordinance and implement voluntary energy-saving design features. Impacts on energy and telecommunications would be *not significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not exceed utility service capacities or result in wasteful electricity consumption, and impacts would be *not significant*.

4.10.4 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

4.10.4.1 Construction Impacts

4.10.4.1.1 Factors 1 and 2: Water

Alternative 2 would be the same as Alternative 1 except the stadium proposed under Alternative 1 would be replaced with 2,500,000 ft^2 (232,257.6 m^2) of additional R&D areas emphasizing new technologies at HPS. Expansion of an AWSS would be required to provide adequate water supply for fire protection at the project site. Under Alternative 2, impacts on water during construction would be to the same as those described for Alternative 1 in Section 4.10.2.1.1. *No impacts* on water would occur and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option for Alternative 2, would not impact water resources, and *no impacts* would occur.

4.10.4.1.2 Factors 3 and 4: Wastewater

Under Alternative 2, impacts on wastewater during construction would be the same as those described for Alternative 1 in Section 4.10.2.1.2. *No impacts* on wastewater would occur and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2, would not impact wastewater treatment or collection facilities and *no impacts* would occur.

4.10.4.1.3 Factors 5 and 6: Solid Waste

Alternative 2 construction wastes, including demolition and hazardous wastes, would be similar to that generated by Alternative 1 because construction materials would be similar for both alternatives. In addition, four structures (Buildings 211, 224, 231, and 253) could be preserved under this alternative, which would further reduce impacts on solid waste facilities during construction. Construction waste would be sorted, prior to disposal, to ensure that all recyclable materials are salvaged from the waste that is ultimately taken to a landfill. In addition, the future developer or owner of the property would prepare an SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). Therefore, with implementation of environmental controls, impacts to solid waste during construction would be *not significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2, would not impact solid waste facilities, and impacts would be *not significant*.

4.10.4.1.4 Factors 7, 8, and 9: Energy and Telecommunications

Under Alternative 2, impacts on energy and telecommunications during construction would be the same as those described for Alternative 1 in Section 4.10.2.1.4. Impacts of Alternative 2 construction activities, including demolition and installation of new utility infrastructure, are discussed for each resource area in other sections of Chapter 4, Environmental Consequences. No new construction impacts to utilities, beyond those identified in Chapter 4, Environmental Consequences, would occur with construction of utility infrastructure. Impacts on energy and telecommunications would be *not significant*. Since impacts on energy and telecommunications would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2, would not impact energy and telecommunications infrastructure, and impacts would be *not significant*.

4.10.4.2 Operational Impacts

4.10.4.2.1 Factors 1 and 2: Water

Water demands associated with Alternative 2 operational activities would be similar but slightly greater than Alternative 1 as the number of jobs associated with the additional R&D uses would increase compared to Alternative 1. The existing Regional Water System would be expected to have sufficient capacity to meet any future water demands resulting from implementation of Alternative 2. Subsequent to transfer of HPS to the city, the city and SFPUC would be responsible for upgrading, managing, and operating onsite water infrastructure. Similar to Alternative 1, Alternative 2 would require upgrading and expansion of the existing water supply infrastructure at HPS, including construction of a low pressure water system, recycled water system, and AWSS. Sufficient treatment capacity would continue to be available to meet the likely future water treatment needs of the entire Regional Water System and thereby meet retail demand for the net increase of 0.83 MGD (3.14 ML/d) for Alternative 2. As with Alternative 1, after 2030, during multiple dry-year periods, the total retail water supply would be slightly less than estimated total demand, including demand associated with Alternative 2. However, implementation of regional system improvements (i.e., Water Shortage Allocation Plan and Retail Water Shortage Allocation Plan water conservation strategies) during multiple dry-year periods would ensure projected future water supplies could accommodate estimated future water demands, including Alternative 2 demands. As the current and planned treatment capacity of existing Regional Water System water treatment facilities is sufficient to serve this alternative, implementation of Alternative 2 would not require or result in the construction of new or expanded water treatment facilities, and this impact would be *not significant.* Since impacts on water would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 2, would not require water supplies in excess of existing entitlements or result in the construction of new or expanded water treatment facilities, and impacts would be *not significant*.

4.10.4.2.2 Factors 3 and 4: Wastewater

Under Alternative 2, wastewater volumes associated with operational activities would be similar but slightly greater than Alternative 1 as there would be additional employees associated with the proposed

R&D uses compared to Alternative 1. Similar to Alternative 1, Alternative 2 would replace or upgrade existing wastewater infrastructure within the project site. Implementation of Alternative 2 would not require expansion of existing offsite wastewater conveyance facilities. Subsequent to transfer of HPS to the city, the city would be responsible for upgrading, managing, and operating onsite wastewater and storm drainage infrastructure.

As shown in Table 4.10.4-1, Alternative 2 would result in the generation of 0.64 MGD (2.42 ML/d) of wastewater. Wastewater flows would be transported via new or expanded conveyance systems within the project site and existing mains to the SWPCP (Winzler & Kelly Consulting Engineers 2009). The existing wastewater/stormwater conveyance lines between the project site and the SWPCP are sized to accommodate both dry- and wet-weather flows. Similar to Alternative 1, wastewater generated from Alternative 2 would flow into the Hunters Point tunnel sewer. Under Alternative 2, projected maximum peak flows would be 1,333 GPM (5,045 liters/minute) (Table 4.10.4-2). As the Hunters Point tunnel sewer would have a remaining capacity of 69,499 GPM (263,054 liters/minute) during peak dry-weather flow conditions, the addition of 1,333 GPM (5,045 liters/minute) peak flow from proposed development would be accommodated within the remaining capacity of the Hunters Point tunnel sewer. Therefore, no expansion of the existing offsite conveyance infrastructure would be required to accommodate dry-weather flows from proposed development. As the existing conveyance infrastructure could accommodate the additional flows from proposed development in addition to existing flows, even during periods of peak flow conditions, impacts would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Table 4.10.4-1. Alternative 2 Wastewater Generation

Land Use	*Estimated Wastewater Generation Expressed as Percent of Water Demand (or as otherwise specified)*	*HPS (MGD)*
Residential	95%	0.21
Regional Retail	57%	0
Neighborhood Retail	57%	0.01
Office	57%	0.01
Community Uses	57%	0.01
Research and Development	57%	0.40
Hotel	57%	0
Football Stadium	95%	0
Performance Venue	95%	0
	Total	**0.64**

Source: Appendix Q2 of the CP-HPS DEIR (SFRA 2009).

Table 4.10.4-2. Alternative 2 Sewer Trunk Capacity and Maximum Peak Flows

Sewer Trunk	*Design Capacity (GPM)*	*Existing Average Dry-Weather Flow[a] (GPM)*	*Existing Maximum Peak Dry-Weather Flow[b] (GPM)*	*Alternative 2 Contribution – Maximum Peak Dry-Weather Flow[c] (GPM)*	*Remaining Peak Flow Capacity (GPM) With R&D Variant*
Hunters Point tunnel sewer	83,333	4,167[d]	12,501[d]	1,333	69,499[e]

Notes:

a. Calculated as existing average dry-weather flow in MGD/24 hours/60 minutes x 1,000,000.
b. Calculated as existing average flow in GPM x peaking factor of 3.0.
c. Calculated as proposed average dry-weather flow in MGD/24 hours/60 minutes x 1,000,000 x peaking factor of 3.0.
d. These flows are *inclusive* of flows from the Candlestick tunnel sewer.
e. Calculated as design capacity less existing maximum peak flow less Alternative 2 maximum peak flow, all in GPM. This calculation does NOT take credit for the existing uses on the HPS site that will be demolished that currently contribute wastewater flows to the Hunters Point tunnel sewer. Therefore, the actual remaining peak flow capacity of the Hunters Point tunnel sewer with Alternative 2 will be somewhat greater than 69,499 GPM (263,054 liters/minute).

Source: SFPUC 2002.

The contribution of wastewater generated under Alternative 2 to the Combined Sewer System represents a small percentage of its available capacity and would be accommodated by the existing infrastructure. Although development would increase wastewater flows, the provision of separate stormwater and sewer systems would reduce overall wet-weather volumes to the Combined Sewer System. The proposed diversion of wet-weather flows from the Combined Sewer System would offset the increase in dry-weather flows. Similar to Alternative 1, the future developer or owner of the property would ensure there would be no increase in CSO flows as a result of Alternative 2 by providing temporary detention or retention of wastewater onsite during wet weather or completion of the separate stormwater and wastewater systems (Section 2.3.2.1.9, Environmental Controls). Therefore, with implementation of environmental controls, impacts on the wastewater conveyance and treatment system would be *not significant*.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 2, would not require expansion of existing wastewater conveyance facilities and impacts would be *not significant*.

4.10.4.2.3 Factors 5 and 6: Solid Waste

The amount and type of solid waste generated during Alternative 2 operations would be similar to Alternative 1. As with Alternative 1, solid waste demands would not result in the exceedance of current landfill capacities. As shown in Table 4.10.4-3, Alternative 2 would result in 9,143 tons (8,294 Mg) of waste at full build-out, which would constitute 3.6 percent of the city's total waste stream (CIWMB 2008). The increase in solid waste generation associated with Alternative 2 would not be substantial in the context of citywide solid waste demands.

Table 4.10.4-3. Alternative 2 Solid Waste Generation

Use	*Generation Factor (per day)*	*Alternative 2*		
		Area or Units	*Tons per Day or Event*	*Tons per Year*
Residential	5.653 lbs/unit	2,650 units	7.5	2,737.5
Retail	0.02600411 lbs/ft^2	125,000 ft^2	1.6	584.0
Office	0.006 lbs/ft^2	0	0	0
Hotel	0.0108 lbs/ft^2	0	0	0
R&D	0.006 lbs/ft^2	5,000,000 ft^2	15	5,475
Performance Venue	2.23 lbs/seat	0	0	0
Stadium	2.23 lbs/seat	0	0	0
Art Center	0.006 lbs/ft^2	255,000 ft^2	0.8	292
Community Facilities	0.006 lbs/ft^2	50,000 ft^2	0.15	54.8
			Total	**9143**

Source: PBS&J 2009b.

Recycling, composting, and trash facilities would be provided as required by city specifications. In addition, consistent with the city's goal of achieving zero waste by 2020, the future developer or owner of the property would prepare a SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). With implementation of environmental controls, impacts on solid waste facilities during Alternative 2 operations would be *not significant*.

Under Alternative 2, impacts associated with hazardous waste generation during operations would be the same as those described for Alternative 1. The specific businesses or activities that could operate under Alternative 2 are not known at this time. Under Alternative 2, individual entities would not likely generate more than 60 lbs (27 kg) of hazardous waste per month. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all anticipated hazardous wastes. Because the minimal amount of hazardous waste generated by Alternative 2 could be accommodated by existing facilities, this impact would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Alternative 2 would not conflict with regulatory policies pertaining to solid waste. This impact would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 2, would not impact solid waste and permitted landfill capacities or conflict with solid waste regulatory policies, and impacts would be *not significant*.

4.10.4.2.4 Factors 7, 8, and 9: Energy and Telecommunications

Electricity Use

Energy usage associated with Alternative 2 operations would be similar but slightly greater than Alternative 1 due to the additional R&D uses. As shown in Table 4.10.4-4, Alternative 2 would result in an electricity demand of 27,643 MWh. While this is slightly more than Alternative 1, this would not be a large overall increase in consumption over existing conditions of (9,990 MWh). However, two uses (residential and R&D) would account for 90 percent of the increase in demand for electricity at the project site. R&D uses would be the largest source of electricity consumption because these uses result in heavy electricity consumption during peak daytime hours (largely due to HVAC, lighting, and operation of office equipment), which could generate high levels of peak demand, similar to Alternative 1. Alternative 2 would be designed and constructed to reduce energy demands to 15 percent below 2008 Title 24 standards. Further electricity savings would be anticipated as a result of compliance with the Green Building Ordinance, installation of ENERGY STAR appliances, and implementation of LEED® ND standards. Therefore, implementation of energy reductions and voluntary green building practices (beyond the measures required in the city's Green Building Ordinance) would reduce electricity consumption impacts to *not significant*. Since impacts would not be significant, no mitigation is proposed.

Table 4.10.4-4. Alternative 2 Electricity Demand from Building Envelopes

Type of Use	Electricity Use Factor, 2008 Title 24 Standards (MWh/gft^2 or unit)[a]	Alternative 2		
		Development Program	MWh Consumed Annually, Title 24 Standards	MWh Consumed Annually, with 15 Percent Reduction
Residential Units	1.7350[b]	2,650	4,598	3,908
Retail	0.0027	—	0	0
Neighborhood Retail	0.0027	125,000	338	287
Office	0.0052	—	0	0
R&D	0.0052	5,000,000	26,000	22,100
Hotel	0.0027	—	0	0
Artists' Studios/Art Center	0.0052	255,000	1,326	1,127
Community Space	0.0052	50,000	260	221
Arena	0.0015	—	0	0
		Total	**32,522**	**27,643**

Notes:

R&D electricity demand was estimated based on the energy efficiency performance target of 15 percent energy reductions below Title 24 standards and the use ENERGY STAR appliances in new residential units.

a. The energy use factor cited for residential units is from: Table 3-8 (SFRA 2009). The factor was derived by subtracting the "Plug-in" factor from the "Electricity Delivered, Total" column (in the "15 percent Better than Title 24 2008 and ENERGY STAR Appliances" row). The factor was converted from kWh to MWh (1 MWh = 1,000 kWh).

b. The electricity factors cited for non-residential uses are from: Table 3-16 (SFRA 2009). The factors are in the "Non-Title 24" column. The factors were converted from kWh to MWh.

Source: Appendix S of the CP-HPS DEIR (SFRA 2009).

Natural Gas Use

Alternative 2 would result in a demand for natural gas that would be almost twice that of Alternative 1. Table 4.10.4-5 presents the annual natural gas usage for Alternative 2, which includes estimates based on the energy efficiency performance target of reducing energy use to 15 percent below Title 24 standards. The annual natural gas demand associated with Alternative 2 would be 90,266 MBtu (Table 4.10.4-5). Overall natural gas demands would be over four times higher than under existing conditions, which would be largely attributable to R&D uses. However, natural gas usage at the project site would represent less than 1 percent of the city's overall natural gas consumption of 28,918,000 MBtu.

Table 4.10.4-5. Alternative 2 Natural Gas Demand, Baseline

Type of Use	***Natural Gas Use Factor, 2008 Title 24 Standards (MWh/gft² or unit)[a]***	***Alternative 2***		
		Development Program	*MBtu Consumed Annually, 2008 Title 24 Standards*	*MBtu Consumed Annually, with 15 Percent Reduction*
Residential Units	0.0360[b]	2,650	95	81
Retail	0.0048	—	—	—
Neighborhood Retail	0.0048	125,000	600	510
Office	0.0200	—	—	—
R&D	0.0200	5,000,000	100,000	85,000
Hotel	0.0345	—	—	—
Artists' Studios/Art Center	0.0200	225,000	4,500	3,825
Community Space	0.0200	50,000	1,000	850
Arena	0.0243	—	—	—
		Total	**106,909**	**90,266**
		Percent of Total	**92%**	

Notes:

Baseline R&D natural gas demand was estimated based on land use and basic compliance with 2008 Title 24 standards.

a. The natural gas factors cited for non-residential uses are from: Table 3-16 (SFRA 2009). The factors are in the "Overall Based on 2008 Title 24" column. The factors were converted from kBtu to MBtu.

b. The natural gas factor cited for residential units is from: Table 3-8 (SFRA 2009). The factor is in the "Natural Gas Delivered, Total" column and the "Minimally Title 24 Compliant (2008)" row. The factor was converted from kBtu to MBtu (1 MBtu = 1,000 kBtu).

Source: Appendix S of the CP-HPS DEIR (SFRA 2009).

This alternative would implement energy reductions and voluntary green building practices beyond the measures required in the city's Green Building Ordinance. In addition, new residential units would be designed 15 percent more energy efficient than the 2008 Title 24 standards. Although plug-in energy use (appliances, office equipment, plug-in cooking equipment, electronics, and other plug-in loads) is not governed under Title 24 standards, ENERGY STAR appliances are proposed for new residential units. Such measures would reduce natural gas consumption impacts to *not significant*.

Petroleum Fuel Use

Alternative 2 would increase trips to and from the site, increasing the use of petroleum fuels. However, Alternative 2 would: 1) minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; 2) include a TDM program designed to reduce the remaining vehicle trips; and 3) result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as the overall trip lengths. However, because project site plans are in the preliminary design stage, mitigation measures are included in Section 4.1, Transportation, Traffic, and Circulation, which require implementation of specified circulation improvements to minimize VMT. Implementation of these mitigation measures would ensure impacts would be *not significant*.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 2, would not exceed utility service capacities or result in wasteful electricity consumption, and impacts would be *not significant*.

4.10.5 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

4.10.5.1 Construction Impacts

4.10.5.1.1 Factors 1 and 2: Water

Under this alternative, the stadium proposed under Alternative 1 would be replaced with additional housing and R&D areas emphasizing new technologies at HPS. Under Alternative 2A, impacts on water during construction would be the same as those described for Alternative 1. *No impacts* on water would occur and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2A, would not impact water resources, and *no impacts* would occur.

4.10.5.1.2 Factors 3 and 4: Wastewater

Under Alternative 2A, impacts on wastewater during construction would be the same as those described for Alternative 1. *No impacts* on wastewater would occur and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2A, would not impact wastewater treatment or collection facilities and *no impacts* would occur.

4.10.5.1.3 Factors 5 and 6: Solid Waste

Construction wastes generated by Alternative 2A would be similar to that generated by Alternative 1. In addition, four structures (Buildings 211, 224, 231, and 253) could be preserved under this alternative, which would further reduce impacts on solid waste facilities during construction. Construction waste would be sorted, prior to disposal, to ensure that all recyclable materials are salvaged from the waste that is ultimately taken to a landfill. In addition, the future developer or owner of the property would prepare an SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). Therefore, with implementation of environmental controls impacts to solid waste during construction would be *not significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2A, would not impact solid waste facilities, and impacts would be *not significant*.

4.10.5.1.4 Factors 7, 8, and 9: Energy and Telecommunications

Impacts on energy and telecommunications during Alternative 2A construction activities would be the same as those described for Alternative 1. Impacts of Alternative 2A construction activities are discussed for each resource area in other sections of Chapter 4, Environmental Consequences. No new construction impacts to utilities, beyond those identified in Chapter 4, Environmental Consequences, would occur with construction of utility infrastructure. Impacts on energy and telecommunications would be *not significant*. Since impacts on energy and telecommunications would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2A, would not impact energy and telecommunications infrastructure, and impacts would be *not significant*.

4.10.5.2 Operational Impacts

4.10.5.2.1 Factors 1 and 2: Water

Water demands associated with Alternative 2A operational activities would be similar but slightly greater than Alternative 1 as the number of jobs associated with the additional R&D uses and residents associated with additional housing units would increase compared to Alternative 1. This alternative would not require water supplies in excess of existing entitlements or result in the need for new or expanded entitlements, or require construction of new or expanded water treatment facilities. The existing Regional Water System would be expected to have sufficient capacity to meet any future water supply demands resulting from implementation of Alternative 1. Subsequent to transfer of HPS to the city, the city and SFPUC would be responsible for upgrading, managing, and operating onsite water infrastructure. Alternative 2 would require upgrading and expansion of the existing water supply infrastructure at HPS, including construction of a low pressure water system, recycled water system, and AWSS.

As with Alternative 1, sufficient treatment capacity would continue to be available to meet the likely future water treatment needs of the entire Regional Water System, and thereby meet water demands generated under Alternative 2A. As with Alternative 1, after 2030, during multiple dry-year periods, the total retail water supply would be slightly less than estimated total demand, including demand associated with Alternative 2A. However, implementation of regional system improvements (i.e., Water Shortage Allocation Plan and Retail Water Shortage Allocation Plan water conservation strategies) during multiple dry-year periods would ensure projected future water supplies could accommodate estimated future water demands, including Alternative 2A demands. As the current and planned treatment capacity of existing Regional Water System water treatment facilities is sufficient to serve this alternative, implementation of Alternative 2A would not require or result in the construction of new or expanded water treatment facilities, and this impact would be *not significant.* Since impacts on water would be *not significant*, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 2A, would not require water supplies in excess of existing entitlements or result in the construction of new or expanded water treatment facilities, and impacts would be *not significant*.

4.10.5.2.2 Factors 3 and 4: Wastewater

Under Alternative 2A, wastewater volumes associated with operational activities would be similar but slightly greater than Alternative 1 as there would be additional employees and residents associated with the proposed R&D and residential uses compared to Alternative 1. Alternative 2A would replace or upgrade existing wastewater infrastructure within the project site. Implementation of Alternative 2A would not require expansion of existing offsite wastewater conveyance facilities. Subsequent to transfer of HPS to the city, the city would be responsible for upgrading, managing, and operating onsite wastewater and storm drainage infrastructure.

Wastewater generated by Alternative 2A would be transported via new or expanded conveyance systems within the project site and existing mains to the SWPCP. The existing wastewater/stormwater conveyance lines between the project site and the SWPCP are sized to accommodate both dry- and wet-weather flows. Similar to Alternative 1, wastewater generated from Alternative 2A would flow into the Hunters Point tunnel sewer. The additional peak flows generated from Alternative 2A would be accommodated within the remaining capacity of the Hunters Point tunnel sewer. No expansion of the existing offsite conveyance infrastructure would be required to accommodate dry-weather flows from proposed development. Therefore, impacts would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

The contribution of wastewater generated under Alternative 2A to the Combined Sewer System represents a small percentage of its available capacity and would be accommodated by the existing infrastructure. Although development would increase wastewater flows, the provision of separate stormwater and sewer systems would reduce overall wet-weather volumes to the Combined Sewer System. The proposed diversion of wet-weather flows from the Combined Sewer System would offset the increase in dry-weather flows. Similar to Alternative 1, the future developer or owner of the property would ensure there would be no increase in CSO flows as a result of Alternative 2A operations by providing temporary detention or retention of wastewater onsite during wet weather or completion of the separate stormwater and wastewater systems (Section 2.3.2.1.9, Environmental Controls). Therefore, with implementation of environmental controls impacts on the wastewater conveyance and treatment system would be *not significant*.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 2A, would not require expansion of existing wastewater conveyance facilities and impacts would be *not significant*.

4.10.5.2.3 Factors 5 and 6: Solid Waste

The amount and type of solid waste generated during Alternative 2A operations would be similar to Alternative 1. Solid waste demands would not result in the exceedance of current landfill capacities. Under this alternative, recycling, composting, and trash facilities would be provided as required by city specifications. In addition, consistent with the city's goal of achieving zero waste by 2020, the future developer or owner of the property would prepare an SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). With implementation of environmental controls, impacts on solid waste facilities during Alternative 2A operations would be *not significant*.

Under Alternative 2A, impacts associated with hazardous waste generation during operations would be the same as those described for Alternative 1. Under Alternative 2A, individual entities would not likely generate more than 60 lbs (27 kg) of hazardous waste per month. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all anticipated hazardous wastes. Because the minimal amount of hazardous waste generated by Alternative 2A could be accommodated by existing facilities, this impact would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Alternative 2A would not conflict with regulatory policies pertaining to solid waste. This impact would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 2A, would not impact solid waste and permitted landfill capacities or conflict with solid waste regulatory policies, and impacts would be *not significant*.

4.10.5.2.4 Factors 7, 8, and 9: Energy and Telecommunications

Electricity Use

Alternative 2A would result in a slightly greater electricity demand compared to Alternative 1 due to the additional housing and R&D uses. R&D uses would be the largest source of electricity consumption at the project site because these uses result in heavy electricity consumption during peak daytime hours (largely due to HVAC, lighting, and operation of office equipment), which could generate high levels of peak demand. As discussed for Alternative 1, Alternative 2A would be designed and constructed to reduce energy demands to 15 percent below 2008 Title 24 standards. Further electricity savings would be anticipated as a result of compliance with the Green Building Ordinance, installation of ENERGY STAR appliances, and implementation of LEED® ND standards. Therefore, implementation of energy reductions and voluntary green building practices (beyond the measures required in the city's Green Building Ordinance) would reduce electricity consumption impacts to *not significant*. Since impacts would not be significant, no mitigation is proposed.

Natural Gas Use

Alternative 2A would result in increased natural gas demands compared to Alternative 1. Overall natural gas demands would be substantially greater than under existing conditions, which would be largely attributable to R&D uses. Similar to Alternative 1, this alternative would implement energy reductions and voluntary green building practices beyond the measures required in the city's Green Building Ordinance. In addition, new residential units would be designed 15 percent more energy efficient than the 2008 Title 24 standards. Although plug-in energy use (appliances, office equipment, plug-in cooking equipment, electronics, and other plug-in loads) is not governed under Title 24 standards, ENERGY STAR appliances are proposed for new residential units. Such measures would reduce natural gas consumption impacts to *not significant*.

Petroleum Fuel Use

Alternative 2A would increase trips to and from the site, increasing the use of petroleum fuels. However, Alternative 2A would: 1) minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; 2) include a TDM program designed to reduce the remaining vehicle trips; and 3) result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as the overall trip lengths. However, because project site plans are in the preliminary design stage, mitigation measures are included in Section 4.1, Transportation, Traffic, and Circulation, which require implementation of specified circulation improvements to minimize VMT. Implementation of these mitigation measures would ensure impacts would be *not significant*.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 2A, would not exceed utility service capacities or result in wasteful electricity consumption, and impacts would be *not significant*.

4.10.6 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

4.10.6.1 Construction Impacts

4.10.6.1.1 Factors 1 and 2: Water

Alternative 3 would be the same as Alternative 1 except the stadium proposed under Alternative 1 would be replaced with 1,350 additional residential units. Under Alternative 3, impacts on water during construction would be the same as those described for Alternative 1. *No impacts* on water would occur and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 3, would not impact water resources, and *no impacts* would occur.

4.10.6.1.2 Factors 3 and 4: Wastewater

Under Alternative 3, impacts on wastewater during construction would be the same as those described for Alternative 1. *No impacts* on wastewater would occur and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 3, would not impact wastewater treatment or collection facilities and *no impacts* would occur.

4.10.6.1.3 Factors 5 and 6: Solid Waste

Alternative 3 construction wastes, including demolition and hazardous wastes, would be similar to that generated by Alternative 1 because construction materials would be similar for both alternatives. However, four structures (Buildings 211, 224, 231, and 253) could be preserved under this alternative, which would further reduce impacts on solid waste facilities during construction. Construction waste would be sorted, prior to disposal, to ensure that all recyclable materials are salvaged from the waste stream that is ultimately taken to a landfill. In addition, the future developer or owner of the property would prepare an SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). Therefore, with implementation of environmental controls, impacts to solid waste during construction would be *not significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 3, would not impact solid waste facilities, and impacts would be *not significant*.

4.10.6.1.4 Factors 7, 8, and 9: Energy and Telecommunications

Under Alternative 3, impacts on energy and telecommunications during construction would be the same as those described for Alternative 1. Impacts of Alternative 3 construction activities, including demolition and installation of new utility infrastructure, are discussed for each resource area in other sections of Chapter 4, Environmental Consequences. No new construction impacts to utilities, beyond those identified in Chapter 4, Environmental Consequences, would occur with construction of utility infrastructure. Impacts on energy and telecommunications would be *not significant*. Since impacts on energy and telecommunications would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 3, would not impact energy and telecommunications infrastructure, and impacts would be *not significant*.

4.10.6.2 Operational Impacts

4.10.6.2.1 Factors 1 and 2: Water

Water demands associated with Alternative 3 operational activities would be similar but slightly greater than Alternative 1 as the number of residents would increase compared to Alternative 1. The existing Regional Water System would be expected to have sufficient capacity to meet any future water supply demands resulting from implementation of Alternative 1. Subsequent to transfer of HPS to the city, the city and SFPUC would be responsible for upgrading, managing, and operating onsite water infrastructure. Similar to Alternative 1, Alternative 3 would require upgrading and expansion of the existing water supply infrastructure at HPS, including construction of a low pressure water system, recycled water system, and AWSS.

Based on the density of development at full buildout, Alternative 3 would require water at a rate of approximately 0.88 MGD (3.3X ML/d) (Table 4.10.6-1). This is in excess of existing baseline conditions (0.3 MGD [1.1 ML/d]), and greater than Alternative 1 (0.13 MGD [0.49 ML/d]). Although the project site would have increased water demands, water usage would be reduced through implementation of environmental controls to minimize water consumption (Section 2.3.2.1.9, Environmental Controls).

Table 4.10.6-1. Alternative 3 Projected Water Demand

	Existing Baseline Conditions (MGD)	***Buildout/Full Occupancy (2032) (MGD)***
Water Demand	0.3	0.88
Net Change	N/A	+ 0.58
Source: Appendix Q2 of the CP-HPS DEIR (SFRA 2009).		

Similar to Alternative 1, sufficient treatment capacity would continue to be available to meet the likely future water treatment needs of the entire Regional Water System and thereby meet retail demand for the net increase of 0.58 MGD (2.2 ML/d) for Alternative 3. As with Alternative 1, after 2030, during multiple dry-year periods, the total retail water supply would be slightly less than estimated total demand, including demand associated with Alternative 3. However, implementation of regional system improvements (i.e., Water Shortage Allocation Plan and Retail Water Shortage Allocation Plan water conservation strategies) during multiple dry-year periods would ensure projected future water supplies could accommodate estimated future water demands, including Alternative 3 demands. As the current and planned treatment capacity of existing Regional Water System water treatment facilities is sufficient to serve this alternative, implementation of Alternative 3 would not require or result in the construction of new or expanded water treatment facilities, and this impact would be *not significant.* Since impacts on water would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 3, would not require water supplies in excess of existing entitlements or result in the construction of new or expanded water treatment facilities, and impacts would be *not significant*.

4.10.6.2.2 Factors 3 and 4: Wastewater

Under Alternative 3, wastewater volumes associated with operational activities would be similar but slightly greater than Alternative 1 due to the increase in residents associated with the additional housing units. Alternative 3 would replace or upgrade existing wastewater infrastructure within the project site.

Implementation of Alternative 3 would not require expansion of existing offsite wastewater conveyance facilities. Subsequent to transfer of HPS to the city, the city would be responsible for upgrading, managing, and operating onsite wastewater and storm drainage infrastructure.

As shown in Table 4.10.6-2, Alternative 3 would result in the generation of 0.55 MGD (2.1 ML/d) of wastewater, an increase of 0.08 MGD (0.3 ML/d) of wastewater from Alternative 1. Wastewater flows would be transported via new or expanded conveyance systems within the site and existing mains to the SWPCP (Winzler & Kelly Consulting Engineers 2009). The existing wastewater/stormwater conveyance lines between the project site and the SWPCP are sized to accommodate both dry- and wet-weather flows. Under Alternative 3, projected maximum peak flows would be 1,145 GPM (4,334 liters/minute) (Table 4.10.6-3). As the Hunters Point tunnel sewer would have a remaining capacity of 69,687 GPM (263,765 liters/minute) during peak dry-weather flow conditions, the addition of 1,145 GPM (4,334 liters/minute) peak flow from proposed development would be accommodated within the remaining capacity of the Hunters Point tunnel sewer. Therefore, no expansion of the existing offsite conveyance infrastructure would be required to accommodate dry-weather flows from proposed development. As the existing conveyance infrastructure could accommodate the additional flows from proposed development in addition to existing flows, even during periods of peak flow conditions, impacts would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Table 4.10.6-2. Alternative 3 Wastewater Generation

Land Use	*Estimated Wastewater Generation Expressed as Percent of Water Demand (or as otherwise specified)*	*HPS (MGD)*
Residential	95%	0.31
Regional Retail	57%	0
Neighborhood Retail	57%	0.01
Office	57%	0.01
Community Uses	57%	0.01
Research and Development	57%	0.21
Hotel	57%	0
Football Stadium	95%	0
Performance Venue	95	0
	Total	**0.55**

Source: Appendix Q2 of the CP-HPS DEIR (SFRA 2009).

Table 4.10.6-3. Alternative 3 Sewer Trunk Capacity and Maximum Peak Flows

Sewer Trunk	*Design Capacity (GPM)*	*Existing Average Dry-Weather Flow[a] (GPM)*	*Existing Maximum Peak Dry-Weather Flow[b] (GPM)*	*Alternative 3 Contribution – Maximum Peak Dry-Weather Flow[c] (GPM)*	*Remaining Peak Flow Capacity (GPM) With Housing Variant*
Hunters Point tunnel sewer	83,333	4,167[d]	12,501[d]	1,145	69,687[e]

Notes:

a. Calculated as existing average dry-weather flow in MGD/24 hours/60 minutes x 1,000,000.
b. Calculated as existing average flow in GPM x peaking factor of 3.0.
c. Calculated as proposed average dry-weather flow in MGD/24 hours/60 minutes x 1,000,000 x peaking factor of 3.0.
d. These flows are inclusive of flows from the Candlestick tunnel sewer.
e. Calculated as design capacity less existing maximum peak flow less Alternative 3 maximum peak flow, all in GPM. This calculation does NOT take credit for the existing uses on the HPS site that will be demolished that currently contribute wastewater flows to the Hunters Point tunnel sewer. Therefore, the actual remaining peak flow capacity of the Hunters Point tunnel sewer with Alternative 3 will be somewhat greater than 69,687 GPM (263,765 liters/minute).

Source: SFPUC 2002.

The contribution of wastewater generated under Alternative 3 to the Combined Sewer System represents a small percentage of its available capacity and would be accommodated by the existing infrastructure. Although development would increase wastewater flows, the provision of separate stormwater and sewer systems would reduce overall wet-weather volumes to the Combined Sewer System. The proposed diversion of wet-weather flows from the Combined Sewer System would offset the increase in dry-weather flows. The future developer or owner of the property would ensure there would be no increase in CSO flows as a result of Alternative 3 by providing temporary detention or retention of wastewater onsite during wet weather or completion of the separate stormwater and wastewater systems (Section 2.3.2.1.9, Environmental Controls). Therefore, with implementation of environmental controls, impacts on the wastewater conveyance and treatment system would be *not significant*.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 3, would not require expansion of existing wastewater conveyance facilities and impacts would be *not significant*.

4.10.6.2.3 Factors 5 and 6: Solid Waste

The amount and type of solid waste generated during Alternative 3 operations would be similar to Alternative 1. As with Alternative 1, solid waste demands would not result in the exceedance of current landfill capacities. As shown in Table 4.10.6-4, Alternative 3 would result in 7,793 tons (7,070 Mg) of waste at full build-out, which would constitute 3.1 percent of the city's total waste stream (CIWMB 2008). The increase in solid waste generation associated with Alternative 3 would not be substantial in the context of citywide solid waste infrastructure demands.

Table 4.10.6-4. Alternative 3 Solid Waste Generation

Use	*Generation Factor (per day)*	*Alternative 3*		
		Area or Units	*Tons per Day or Event*	*Tons per Year*
Residential	5.653 lbs/unit	4,000 units	11.3	4,124.5
Retail	0.02600411 lbs/ft^2	125,000 ft^2	1.6	584.0
Office	0.006 lbs/ft^2	0	0	0
Hotel	0.0108 lbs/ft^2	0	0	0
R&D	0.006 lbs/ft^2	2,500,000 ft^2	7.5	2,737.5
Performance Venue	2.23 lbs/seat	0	0	0
Stadium	2.23 lbs/seat	0	0	0
Art Center	0.006 lbs/ft^2	255,000 ft^2	0.8	292
Community Facilities	0.006 lbs/ft^2	50,000 ft^2	0.15	54.8
			Total	**7,792.8**

Source: PBS&J 2009b.

Similar to Alternative 1, recycling, composting, and trash facilities would be provided as required by city specifications. In addition, consistent with the city's goal of achieving zero waste by 2020, the future developer or owner of the property would prepare a SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). With implementation of environmental controls, impacts on solid waste facilities during Alternative 3 operations would be *not significant*.

Under Alternative 3, impacts associated with hazardous waste generation during operations would be the same as those described for Alternative 1. The specific businesses or activities that could operate under Alternative 3 are not known at this time. Under Alternative 3, individual entities would not likely generate more than 60 lbs (27 kg) of hazardous waste per month. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all anticipated hazardous wastes. Because the minimal amount of hazardous waste generated by Alternative 3 could be accommodated by existing facilities, this impact would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Alternative 3 would not conflict with regulatory policies pertaining to solid waste. This impact would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 3, would not impact solid waste and permitted landfill capacities or conflict with solid waste regulatory policies, and impacts would be *not significant*.

4.10.6.2.4 Factors 7, 8, and 9: Energy and Telecommunications

Electricity Use

Energy usage associated with Alternative 3 operations would be similar but slightly greater than Alternative 1 due to additional R&D uses. As shown in Table 4.10.6-5, Alternative 3 would result in an electricity demand of 16,593 MWh, which would be less than Alternative 1 and would not be a large overall increase in consumption over the existing conditions (9,990 MWh). R&D uses would be the largest source of electricity consumption due to heavy electricity consumption during peak daytime hours. Alternative 3 would be designed and constructed to reduce energy demands to 15 percent below 2008 Title 24 standards. Further electricity savings would be anticipated as a result of compliance with the Green Building Ordinance, installation of ENERGY STAR appliances, and implementation of LEED® ND standards. Therefore, implementation of energy reductions and voluntary green building practices (beyond the measures required in the city's Green Building Ordinance) would reduce electricity consumption impacts to *not significant*. Since impacts would not be significant, no mitigation is proposed.

Table 4.10.6-5. Alternative 3 Electricity Demand from Building Envelopes

Type of Use	Electricity Use Factor, 2008 Title 24 Standards (MWh/gft^2 or unit)[a]	Alternative 3		
		Development Program	MWh Consumed Annually, Title 24 Standards	MWh Consumed Annually, with 15Percent Reduction
Residential Units	1.7350	2,650	4,598	3,908
Retail	0.0027	—	0	0
Neighborhood Retail	0.0027	125,000	338	287
Office	0.0052	—	0	0
R&D	0.0052	2,500,000	13,000	11,050
Hotel	0.0027	—	0	0
Artists' Studios/Art Center	0.0052	255,000	1,326	1,127
Community Space	0.0052	50,000	260	221
Arena	0.0015	—	0	0
		Total	**19,522**	**16,593**

Notes:

a. The energy use factor cited for residential units is from: Table 3-8 (SFRA 2009). The factor was derived by subtracting the "Plug-in" factor from the "Electricity Delivered, Total" column (in the "15 percent Better than Title 24 2008 and ENERGY STAR Appliances" row). The factor was converted from kWh to MWh (1 MWh = 1,000 kWh).

Sources:

Appendix S of the CP-HPS DEIR (SFRA 2009).

Housing electricity demand was estimated based on the energy efficiency performance target of 15 percent energy reductions below Title 24 standards and the use ENERGY STAR appliances in new residential units.

Natural Gas Use

Alternative 3 would result in a natural gas demand that would be approximately 11 percent less than Alternative 1. Table 4.10.6-6 presents the annual natural gas usage for Alternative 3, which includes estimates based on the energy efficiency performance target of reducing energy use to 15 percent below Title 24 standards. The annual natural gas demand would be 47,766 MBtu, which would represent less than 1 percent of the city's overall natural gas consumption of 28,918,000 MBtu.

Table 4.10.6-6. Alternative 3 Natural Gas Demand

Type of Use	*Natural Gas Use Factor, 2008 Title 24 Standards (MWh/gft^2 or unit)[a]*	*Alternative 3*		
		Development Program	*MBtu Consumed Annually, 2008 Title 24 Standards*	*MBtu Consumed Annually, with 15 Percent Reduction*
Residential Units	0.0360	2,650	95	81
Retail	0.0048	—	—	—
Neighborhood Retail	0.0048	125,000	600	510
Office	0.0200	—	—	—
R&D	0.0200	2,500,000	50,000	42,500
Hotel	0.0345	—	—	—
Artists' Studios/Art Center	0.0200	225,000	4,500	3,825
Community Space	0.0200	50,000	1,000	850
Arena	0.0243	—	—	—
		Total	**56,909**	**47,766**
		Percent of Total	**85%**	

Notes:

Baseline Housing natural gas demand was estimated based on land use and basic compliance with 2008 Title 24 standards.

a. The natural gas factors cited for non-residential uses are from: Table 3-16 (SFRA 2009). The factors are in the "Overall Based on 2008 Title 24" column. The factors were converted from kBtu to MBtu.

Source:

Appendix S of the CP-HPS DEIR (SFRA 2009).

This alternative would implement energy reductions and voluntary green building practices beyond the measures required in the city's Green Building Ordinance. In addition, new residential units would be designed 15 percent more energy efficient than the 2008 Title 24 standards. Although plug-in energy use (appliances, office equipment, plug-in cooking equipment, electronics, and other plug-in loads) is not governed under Title 24 standards, ENERGY STAR appliances are proposed for new residential units. Such measures would reduce natural gas consumption impacts to *not significant*.

Petroleum Fuel Use

Alternative 3 would increase trips to and from the site, increasing the use of petroleum fuels. Similar to Alternative 1, Alternative 3 would: 1) minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; 2) include a TDM program designed to reduce the remaining vehicle trips; and 3) result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as the overall trip lengths. However, because project site plans are in the preliminary design stage, mitigation measures are included in Section 4.1, Transportation, Traffic, and Circulation, which require implementation of specified circulation improvements to minimize VMT. Implementation of these mitigation measures would ensure impacts to utilities would be *not significant*.

Minor changes to the project footprint, associated with operation of Tower Variant D or the Building Preservation option for Alternative 3, would not exceed utility service capacities or result in wasteful electricity consumption, and impacts would be *not significant*.

4.10.7 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

4.10.7.1 Construction Impacts

4.10.7.1.1 Factors 1 and 2: Water

Under this alternative, the stadium, Yosemite Slough bridge, marina, and in-water/shoreline improvements associated with the marina would not be constructed. Residential and commercial development would be reduced compared to Alternative 1. Under Alternative 4, impacts on water during construction would be reduced compared to Alternative 1. *No impacts* on water would occur and no mitigation is proposed.

4.10.7.1.2 Factors 3 and 4: Wastewater

Under Alternative 4, impacts on wastewater during construction would be reduced compared to those for Alternative 1. *No impacts* on wastewater would occur and no mitigation is proposed.

4.10.7.1.3 Factors 5 and 6: Solid Waste

Construction wastes generated by Alternative 4 would be reduced compared to Alternative 1 due to elimination of the stadium, Yosemite Slough bridge, marina, and reduced commercial and residential development. In addition, Alternative 4 would further reduce impacts on solid waste facilities during construction as this alternative would preserve four buildings (Buildings 211, 224, 231, and 253) that would be demolished under Alternative 1. Similar to Alternative 1, construction waste would be sorted, prior to disposal, to ensure that all recyclable materials are salvaged from the waste that is ultimately taken to a landfill. In addition, the future developer or owner of the property would prepare an SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). With implementation of environmental controls, impacts to solid waste during construction would be *not significant.*

4.10.7.1.4 Factors 7, 8, and 9: Energy and Telecommunications

Impacts on energy and telecommunications during Alternative 4 construction activities would be less than those described for Alternative 1 because the extent of new structures and infrastructure would be reduced with the elimination of the stadium, Yosemite Slough bridge, marina, and reduced commercial and residential development. Impacts of Alternative 4 construction activities are discussed for each resource area in other sections of Chapter 4, Environmental Consequences. No new construction impacts to utilities, beyond those identified in Chapter 4, Environmental Consequences, would occur with construction of utility infrastructure. Impacts on energy and telecommunications would be *not significant*. Since impacts on energy and telecommunications would not be significant, no mitigation is proposed.

4.10.7.2 Operational Impacts

4.10.7.2.1 Factors 1 and 2: Water

Water demands associated with Alternative 4 operations would be less than Alternative 1 due to the reduced R&D, commercial, and residential development. The existing Regional Water System would be expected to have sufficient capacity to meet any future water supply demands resulting from implementation of Alternative 1. Subsequent to transfer of HPS to the city, the city and SFPUC would be responsible for upgrading, managing, and operating onsite water infrastructure. Similar to Alternative 1, Alternative 4 would require upgrading and expansion of the existing water supply infrastructure at HPS, including construction of a low pressure water system, recycled water system, and AWSS.

Sufficient treatment capacity would continue to be available to meet the likely future water treatment needs of the entire Regional Water System, and thereby meet water demands generated under Alternative 4. Implementation of regional system improvements (i.e., Water Shortage Allocation Plan and Retail Water Shortage Allocation Plan water conservation strategies) during multiple dry-year periods would ensure projected future water supplies could accommodate estimated future water demands, including Alternative 4. As the current and planned treatment capacity of existing Regional Water System water treatment facilities is sufficient to serve this alternative, implementation of Alternative 4 would not require or result in the construction of new or expanded water treatment facilities, and this impact would be *not significant.* Since impacts on water would not be significant, no mitigation is proposed.

4.10.7.2.2 Factors 3 and 4: Wastewater

Under Alternative 4, wastewater volumes during operations would be less than Alternative 1 as there would be fewer employees and residents due to reduced R&D, commercial, and residential development. Alternative 4 would replace or upgrade existing wastewater infrastructure within the project site, but it would not require expansion of existing offsite wastewater conveyance facilities. Subsequent to transfer of HPS to the city, the city would be responsible for upgrading, managing, and operating onsite wastewater and storm drainage infrastructure.

The current remaining treatment capacity of the SWPCP would accommodate the increase in wastewater flows from the development of Alternative 4. Overall flows during wet weather would decrease, indicating that the proposed diversion of wet-weather flows from the Combined Sewer System would offset the increase in dry-weather flows. Based on this analysis, the overall volumes in the Combined Sewer System during wet weather would be less than under existing conditions with implementation of the Alternative 4. It is possible that a temporary increase in CSO volume could occur (which could affect the capacity of the SWPCP for treatment) during wet weather. Similar to Alternative 1, the future developer or owner of the property would ensure there would be no increase in CSO flows as a result of Alternative 4 by providing temporary detention or retention of wastewater onsite during wet weather or completion of the separate stormwater and wastewater systems (Section 2.3.2.1.9, Environmental Controls). With implementation of environmental controls, impacts on the wastewater conveyance and treatment system would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

4.10.7.2.3 Factors 5 and 6: Solid Waste

The amount and type of solid waste generated during Alternative 4 operations would be similar but less than Alternative 1 due to reduced R&D, commercial, and residential development. Solid waste demands would not result in the exceedance of current landfill capacities. Under this alternative, recycling, composting, and trash facilities would be provided as required by city specifications. In addition, consistent with the city’s goal of achieving zero waste by 2020, the future developer or owner of the property would prepare an SWMP that would specify the methods by which the project site would divert operational solid waste to assist the city in achieving its diversion goals (Section 2.3.2.1.9, Environmental Controls). With implementation of environmental controls, impacts on solid waste facilities during Alternative 4 operations would be *not significant*.

Impacts associated with hazardous waste generation during Alternative 4 operations would be the same as those for Alternative 1. Currently, TSDs in California and adjoining states have sufficient capacity to accommodate all anticipated hazardous wastes. Because the minimal amount of hazardous waste generated by Alternative 4 could be accommodated by existing facilities, this impact would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

Alternative 4 would not conflict with regulatory policies pertaining to solid waste. This impact would be *not significant*. Since impacts would not be significant, no mitigation is proposed.

4.10.7.2.4 Factors 7, 8, and 9: Energy and Telecommunications

Electricity Use

Energy usage associated with Alternative 4 operations would be less than Alternative 1 due to reduced R&D, commercial, and residential development. Alternative 4 would be designed and constructed to reduce energy demands to 15 percent below 2008 Title 24 standards. Further electricity savings would be anticipated as a result of compliance with the Green Building Ordinance, installation of ENERGY STAR appliances, and implementation of LEED® ND standards. Therefore, implementation of energy reductions and voluntary green building practices (beyond the measures required in the city's Green Building Ordinance) would reduce electricity consumption impacts to *not significant*. Since impacts would not be significant, no mitigation is proposed.

Natural Gas Use

Alternative 4 operations would result in reduced natural gas demands compared to Alternative 1. This alternative would implement energy reductions and voluntary green building practices beyond the measures required in the city's Green Building Ordinance. In addition, new residential units would be designed 15 percent more energy efficient than the 2008 Title 24 standards. Although plug-in energy use (appliances, office equipment, plug-in cooking equipment, electronics, and other plug-in loads) is not governed under Title 24 standards, ENERGY STAR appliances are proposed for new residential units. Such measures would reduce natural gas consumption impacts to *not significant*. Since impacts would not be significant, no mitigation is proposed.

Petroleum Fuel Use

Alternative 4 would increase trips to and from the site, increasing the use of petroleum fuels. Alternative 4 would: 1) minimize transportation-related fuel use by implementing a number of transit, bicycle, and pedestrian improvements; 2) include a TDM program designed to reduce the remaining vehicle trips; and 3) result in dense development within an urbanized area with a mixture of neighborhood-serving uses, which would reduce the total number of trips to and from the site, as well as the overall trip lengths. However, because project site plans are in the preliminary design stage, mitigation measures are included in Section 4.1, Transportation, Traffic, and Circulation, which require implementation of specified circulation improvements to minimize VMT. Implementation of these mitigation measures would ensure impacts to utilities would be *not significant*.

4.10.8 No Action Alternative

Under the No Action Alternative, the project site would not be disposed of by DoN for subsequent reuse and would remain as a closed federal property under caretaker status. Existing conditions would remain as described in Section 3.10, Utilities, and utility demands would remain unchanged. Therefore, *no impacts* on utilities would occur under the No Action Alternative.

4.10.9 Mitigation

The proposed action and alternatives would not result in significant impacts to utilities. No mitigation is proposed.

4.11 Public Services

4.11.1 Methodology

4.11.1.1 Significance Factors

Factors considered in determining whether an alternative would have significant impacts on public services include the extent or degree to which the implementation of an alternative would:

4.11.1.1.1 Police Protection

Factor 1 Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police protection.

4.11.1.1.2 Fire and Emergency Medical Services

Factor 2 Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire and emergency medical services.

4.11.1.1.3 Schools

Factor 3 Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives of the school district.

4.11.1.1.4 Libraries

Factor 4 Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives for library services.

4.11.1.2 Analytic Method

4.11.1.2.1 Factor 1: Police Protection

Impacts on police protection services are considered significant if an increase in population or development levels would result in inadequate staffing levels (as measured by the ability of the SFPD to respond to call loads), response times, and/or increased demand for services that would require the construction or expansion of new or altered facilities that might have an adverse physical effect on the environment. A significant impact could occur if the project site generated the need for additional officers that could not be accommodated at the existing Bayview Station and would require the construction or expansion of a new facility in the Bayview District. To estimate personnel requirements for new projects, the SFPD considers the size of the incoming residential population and the expected or actual experience with calls for service from other potential uses of the site. The need for additional police services was determined through interviews with SFPD staff, as well as communications with Public Safety Strategies Group (PSSG), a consulting firm hired by the SFPD to access facilities needs.

4.11.1.2.2 Factor 2: Fire and Emergency Medical Services

Impacts on fire protection services are considered significant if an increase in population or development levels would result in inadequate staffing levels, response times, and/or increased demand for services that would require the construction or expansion of new or altered facilities that might have an adverse physical effect on the environment. A significant impact would occur if additional calls anticipated to result from the proposed action could not be accommodated within SFFD's target Code 3 response time of 4.5 minutes. Code 1 and Code 2 is for non-emergency calls with response times of 8 minutes and 20 minutes, respectively, and are not emergency-response related.

The SFFD's response time could be affected by inadequate staffing levels caused by increases in demand. An increase in population or development may result in the need for additional fire protection personnel. The methodology for assessing impacts on fire protection and emergency medical services was determined through interviews with SFFD staff, who reviewed projected response times and development intensities at the project site against the SFFD's target Code 3 response time of 4.5 minutes to determine whether additional staffing and therefore new facilities would be needed to provide adequate future service (personal communication, PBS&J 2008a).

4.11.1.2.3 Factor 3: Schools

Impacts on schools are determined by analyzing the estimated increase in student population as a result of project build-out in 2032 and comparing the increase to the capacity of schools in 2030, the closest year to project build-out for which housing projections have been calculated, to determine whether new or altered facilities would be required, the construction of which could result in substantial adverse environmental effects.

The California Department of Education estimates that one dwelling unit would generate an average of 0.7 students, consisting of 0.5 elementary or middle school students and 0.2 high school students (SFUSD 2009). These rates are a result of statewide sampling that incorporates widely varying dwelling unit types, households, and other demographic characteristics and are routinely used by school districts that have not developed rates for their local jurisdictions (SFUSD 2008). However, those rates do not reflect demographic characteristics of San Francisco, which has fewer children per household than most communities. Therefore, for planning purposes, SFUSD uses a student generation rate of 0.203 students (including elementary, middle, and high school students) per new housing unit (SFUSD 2008). The number of students generated by the proposed action was determined by multiplying the number of housing units by the student generation factor of 0.203. The number of students was distributed evenly by grade. While 26 percent of the total school-age children in San Francisco attend private schools (U.S. Census Bureau 2009b), this analysis conservatively assumes that 100 percent of the school-age children associated with the proposed action would attend public schools.

4.11.1.2.4 Factor 4: Libraries

Impacts on library services are considered significant if an increase in population or development levels would result in an increased demand for library services that would require the need for new or physically altered library facilities in order to maintain acceptable service ratios, the construction of which could result in substantial adverse environmental effects.

4.11.2 Alternative 1: Stadium Plan Alternative

4.11.2.1 Construction Impacts

4.11.2.1.1 Factor 1: Police Protection

Construction activities could result in increased demand for police services if these activities resulted in traffic conflicts requiring SFPD response. Access to the project site during construction would be maintained by implementation of a construction transportation management plan (TMP) (refer to Section 4.1, Transportation, Traffic, and Circulation for additional details). The TMP would provide information to contractors and agencies on how to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. A cohesive program of operational and demand management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities in the BVHP area would be implemented.

Construction activities could also increase demand for SFPD services if the site is not adequately secured, providing increased opportunity for criminal activity. However, the future developer or owner of the property would provide fencing, screening, and security lighting during site preparation and prior to construction of buildings. During non-construction hours, the site would be secured and locked and adequate security lighting would be provided (Section 2.3.2.1.9, Environmental Controls). Therefore, with implementation of environmental controls, impacts on police protection during construction would be *not significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not impact police protection, and would be *not significant*.

4.11.2.1.2 Factor 2: Fire and Emergency Medical Services

During construction of Alternative 1, emergency access to the project site would be maintained through compliance with the TMP (refer to Section 4.1, Transportation, Traffic, and Circulation for additional details). Compliance with the TMP would ensure that access to the project site would not be obstructed during construction activities. As such, Alternative 1 construction activities would not impact SFFD response times, or require expansion of or replacement of SFFD stations. Impacts to the SFFD would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not impact fire and emergency medical services, and impacts would be *not significant*.

4.11.2.1.3 Factor 3: Schools

Alternative 1 construction activities would not generate additional students that would increase demands on the SFUSD system. Also, no SFUSD facilities are located on the project site. All school services would be available to the community throughout the duration of Alternative 1construction activities.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would have no impact on schools. Therefore, *no impact* to schools would occur during construction and no mitigation is proposed.

4.11.2.1.4 Factor 4: Libraries

Alternative 1 construction activities would not result in an increase in population requiring library services. Also, no library branches are located on the project site. All library services would be available to the community throughout the duration of Alternative 1 construction activities.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would have no impact on libraries. Therefore, *no impact* to libraries would occur during construction and no mitigation is proposed.

4.11.2.2 Operational Impacts

4.11.2.2.1 Factor 1: Police Protection

Under Alternative 1, the project site would no longer be owned by the federal government. Subsequent to transfer of the property to the city, HPS would not be a secured military facility, and access to the project site would be available to the general public. The project site would be under the jurisdiction of the city, which would be responsible for providing police protection services.

Alternative 1 would result in a new resident population of 6,175 (resulting from 2,650 housing units) and about 7,255 jobs (Section 2.5.2.1, Alternative 1). Existing patrol areas would need to be expanded to provide adequate police coverage to the project site, which would require redeployment of police services within the SFPD Bayview District. The project site is located in two of the five sectors within the Bayview District, both of which have been identified as high demand areas (i.e., areas with high volumes of Priority A calls). As stated in Section 3.11, Public Services, the overall average response time in the Bayview District has improved (decreased) and is better than citywide response time averages.

Demolition and abatement activities on the project site are expected to occur through 2017; the construction of a new stadium is expected to occur between 2014 and 2032. The first ten years of development would not see a substantial increase in police protection demands. As addressed in Section 4.11.2.1.1, ensuring adequate security for all construction areas would be the responsibility of the future developer or owner of the property (Section 2.3.2.1.9, Environmental Controls). Between 2019 and 2032, as new residential and non-residential uses are developed, there would be an increased need for police protection services. Buildout under Alternative 1 would increase the city population by up to 13,429 persons (6,175 residents and 7,255 employees), resulting in a demand of 20 additional police officers in the Bayview District (Table 4.11.2-1) (SFRA 2009).

Table 4.11.2-1. Citywide Number of Police Officers and Alternative 1 Demands

	Population	***Police Officers***
	Citywide (2005)	
Residents	799,302	
Employees	552,167	
Total	**1,351,469**	**2,033**
Ratio (officer to population)	1:665	
	Alternative 1 (2032)	
Residents	6,175	
Employees	7,254	
Total	**13,429**	**20**
Ratio (officer to population)	1:665	

Notes:
The population and households data reported for San Francisco are 2005 data (Personal communication, Rahaim, J. 2009).
Source: PSSG 2008.

Additional SFPD personnel of this magnitude (i.e., 20 officers) needed to serve Alternative 1 could require modifications to the existing Bayview Station or construction of a new station. According to SFPD, there is limited excess capacity at the existing Bayview Station, and the station would not be able to accommodate all 20 of the additional police officers without modification to the existing station or the construction of a new facility (personal communication, Loftus 2009). The exact amount of space that would be needed to support the additional police officers has not yet been determined. Construction of a new SFPD facility on the project site or modifications to the existing Bayview Station would be funded by the future developer or owner of the property and offset by property taxes.

In the event SFPD determines that reconfiguration of the Bayview Station would not be sufficient to accommodate the additional officers, a new station or facility could be constructed within the project site on land designated for community-serving uses. As part of Alternative 1, up to 50,000 gft^2 (4,645.1 gm^2) would be designated for community-serving uses, such as police. This analysis assumes that staffing associated with Alternative 1 could be accommodated within the project site. Construction activities associated with the proposed public facilities, which could include a police station, are considered part of Alternative 1. A discussion of Alternative 1 construction impacts, including those associated with new public facilities, is provided for each resource area in other sections of Chapter 4, Environmental Consequences. No new construction impacts beyond those identified in Chapter 4 would occur with construction of a new police station. As Alternative 1 includes community service uses that could be used for police protection services, and as police services are not tied to a specific station, the SFPD would be able to maintain acceptable levels of service during Alternative 1 operations. Therefore, impacts on police protection would be *not significant*. Since impacts on police protection would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not impact police protection, and impacts would be *not significant*.

4.11.2.2.2 Factor 2: Fire and Emergency Medical Services

Subsequent to transfer of HPS to the city, the project site would be under the jurisdiction of the city, which would be responsible for providing fire and emergency medical services. Alternative 1 would result in up to 2,650 residential units and neighborhood retail, R&D, and community services development. Proposed development would result in a permanent resident population of 6,175 persons and an onsite temporary daytime population of 7,255 employees. Additional development, including a stadium, marina, artists' studios/art center, and parks and open space would further increase the intensity of development on the project site.

Building Safety

Proposed buildings would be designed to meet *San Francisco Fire Code* requirements for emergency access, sprinklers, and water systems, which would minimize demands on fire protection services. In addition, all development, including high-rise residential buildings, would be reviewed by the SFFD to ensure structures are designed in compliance with the *San Francisco Fire Code*, minimizing the potential for fire-related emergencies and reducing the demand for fire protection services at the project site. In addition, Alternative 1 would extend the existing AWSS (high pressure water system for fire protection purposes) and construct a loop system within the project site. Refer to Section 4.10, Utilities, for additional details about proposed water infrastructure improvements, including the AWSS.

Response Time

SFFD Stations 44 and 17 provide primary response to the project site. Three additional stations located nearby could also respond to calls at the project site. SFFD has established a target Code 3 response time of 4.5 minutes for fires and medical emergencies. Conservative estimates of SFFD response times to the project site from surrounding fire stations are 8 to 14 minutes.

Given the density of proposed development and the distance from the nearest fire station, response times to the project site would not be acceptable (personal communication, PBS&J 2008a). SFFD staff concluded that a fire station would be needed at a site that would offer more rapid response to the project site. A new SFFD station could be accommodated on the project site on land designated for community-serving uses. As part of Alternative 1, up to 50,000 gft^2 (4,645 gm^2) would be designated for community-serving uses, such as fire.

Game Day Access

NFL games or other events would result in higher traffic, putting emergency vehicles in competition with civilian cars for traffic lanes. An access network capable of clearing lanes for emergency vehicles when needed would alleviate this potential problem. Prior to construction, review of access strategies for game day and non-game day scenarios would be reviewed by SFFD (SFFD 2009a). In addition, a transportation management system would be implemented during football game days and special events held at the stadium. A traffic control center would be located near the stadium which would 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 (refer to Section 2.5.2.1.3, Transportation Improvements).

Construction of a new SFFD facility on the project site would allow the SFFD to maintain acceptable response times for fire protection and emergency medical services. Construction activities associated with the proposed public facilities, which could include a new fire station, are considered part of Alternative 1. A discussion of Alternative 1 construction impacts, including those associated with new public facilities, is provided for each resource area in other sections of Chapter 4, Environmental Consequences. No new construction impacts beyond those identified in Chapter 4 would occur with construction of a new fire station. Construction of a new SFFD facility on the project site would reduce emergency response times such that impacts would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not impact fire and emergency medical services, and impacts would be *not significant*.

4.11.2.2.3 Factor 3: Schools

Alternative 1 would generate approximately 538 students (Table 4.11.2-2). There are currently no students at the project site. Comparing the 2008 SFUSD school capacity of 63,835 students to a projected 2030 population of 71,573 students, there is a projected shortfall of about 7,738 seats citywide, (i.e., a 12 percent shortfall).

As discussed in Section 3.11, Public Services, improvements are planned for many SFUSD schools, which would modernize existing facilities. In the event that schools located in the project site reach capacity by the year 2032, either due to a reduction in space or an increase in classroom size, the SFUSD may assign students to schools based on a lottery system, which would ensure that student enrollment is distributed to facilities that have sufficient capacity to adequately serve the educational needs of students.

Residential growth within the city over the next 30 years would be addressed by payment of SB 50 fees, and consequently school capacity may improve by the time students are generated by Alternative 1. Further, SFUSD could choose to address its potential future shortfalls in capacity through a wide range of options, including shifting students to other facilities, beginning year-round schools, and/or increasing the use of portable classrooms. While schools in the project vicinity had approximately 49 percent capacity remaining in 2008/2009, it is likely that a 12 percent overcapacity of SFUSD as a result of citywide population growth in 2030 would occur. Payment of school impact fees pursuant to SB 50 would go toward maintaining or improving school facilities to accommodate growth in school attendance. Therefore, SB 50 would ensure that future facilities are provided. Furthermore, increases in municipal expenses associated with additional demands for educational services resulting from Alternative 1 would be offset by a proportional growth in tax revenues associated with redevelopment of HPS. Impacts to schools would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not impact schools, and impacts would be *not significant*.

Table 4.11.2-2. Alternative 1 Buildout Public School Enrollment Compared to SFUSD Capacity

Analysis Area	*Elementary School (Grades K–5)*	*Middle School (Grades 6–8)*	*High School (Grades 9–12)*	*Total*
Project Site[a]	**248**	**124**	**166**	**538**
2030 Citywide Enrollment[b]	33,036	16,518	22,024	71,573
2008 SFUSD Capacity[c]	29,260	11,700	17,575	63,835
2030 Citywide Shortfall	3,776	4,818	4,449	7,738

Notes:

The number of new students in the project site was determined by multiplying the number of proposed housing units by the student generation factor of 0.203. The number of students was distributed evenly by grade.

a. For the project site, 2,650 residential units multiplied by 0.203 SFUSD student generation rate would result in 538 students. 538 students divided by 13 grade levels would result in 41 students per grade. 41 students per grade level multiplied by six grade levels for elementary school equals 248; multiplied by three grade levels for middle school equals 124; and by four grade levels for high school equals 166. Totals may not equal due to rounding.

b. 2030 enrollment was calculated as follows: the 2008/09 SFUSD enrollment was divided by the 2005 citywide school-age population (5–19 years old), which yields a ratio of 0.558. Similarly, the 2030 citywide school-age population (5–19 years old) was multiplied by the ratio of 0.558 to yield a projected 2030 SFUSD enrollment of 71,573. Enrollment was distributed evenly across the grade levels. Totals may not equal due to rounding.

c. The total includes capacity for 5,300 students in varying grade levels in alternative schools and public charter schools.

Sources: ABAG 2007; PBS&J 2009b.

4.11.2.2.4 Factor 4: Libraries

Alternative 1 would increase demands for local library services in the Bayview neighborhood. This alternative would result in a permanent resident population of 6,175 persons and an onsite temporary daytime population of 7,255 employees, resulting in additional demands on library services. Although this would be a substantial population increase, library branches serving the project site, including the new Portola branch (opened in 2009), the Visitacion Valley branch currently under construction (opening in 2011), and the Bayview branch to be expanded beginning in 2010 (opening in late 2011), would continue to meet the demands of the community. Each of the three new library branches serving the project is designed to accommodate 10 to 15 percent growth in its collection size (personal communication, Bannon 2009).

The new SFPL branches, which would all be completed prior to build-out of Alternative 1, would accommodate Alternative 1 demands on library services. No additional library facilities would be required. However, space within the project site could also be dedicated to the provision of library services to supplement the expanded Bayview branch library. Impacts to libraries would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1, would not impact libraries, and impacts would be *not significant*.

4.11.3 Alternative 1A: Stadium Plan/No-Bridge Alternative

4.11.3.1 Construction Impacts

4.11.3.1.1 Factors 1 and 2: Police Protection and Fire and Emergency Medical Services

Alternative 1A would be the same as Alternative 1 except that the Yosemite Slough bridge would not be constructed. Similar to Alternative 1, access to the project site during construction would be maintained by implementation of a TMP, ensuring adequate police and fire and emergency medical response times (refer to Section 4.1, Transportation, for additional details). As such, Alternative 1A construction activities would not impact SFPD or SFFD response times, or require expansion or replacement of police or fire stations. Alternative 1A construction activities would not result in increased demands on police protection services because the future developer or owner of the property would provide fencing, screening, and security lighting during site preparation and prior to construction of buildings. During non-construction hours, the site would be secured and locked and adequate security lighting would be provided (Section 2.3.2.1.9, Environmental Controls). Therefore, impacts on police protection and fire and emergency medical services during construction would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not impact police protection or fire and emergency medical services, and impacts would be *not significant*.

4.11.3.1.2 Factors 3 and 4: Schools and Libraries

Alternative 1A construction activities would not result in an increase in population that would increase demands on the SFUSD system or library services. Also, no SFUSD or library branches are located on the project site. All SFUSD facilities and library services would be available to the community throughout the duration of Alternative 1A construction activities. Therefore, *no impact* to schools or libraries would occur during construction and no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not impact schools and libraries, and impacts would be *not significant*.

4.11.3.2 Operational Impacts

4.11.3.2.1 Factor 1: Police Protection

Subsequent to transfer of the property to the city, the project site would be under the jurisdiction of the city, which would be responsible for providing police protection services. As Alternative 1A would generate the same population as Alternative 1, impacts on police protection would be the same as described for Alternative 1. Existing patrol areas would need to be expanded to provide adequate police coverage to the project site. As with Alternative 1, Alternative 1A would result in a permanent resident population of 6,175 persons and an onsite temporary daytime population of 7,255 employees, resulting in a demand of 20 additional police officers to provide a comparable level of service in the Bayview District. If the SFPD determines that reconfiguration of the Bayview Station would not be sufficient to accommodate the additional officers, a new station or facility could be constructed within the project site on land designated for community-serving uses. As Alternative 1A includes community service uses that could be used for police protection services, and as police services are not tied to a specific station, the SFPD would be able to maintain acceptable levels of service during Alternative 1A operations.

Therefore, impacts on police protection would be *not significant*. Since impacts on police protection would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not impact police protection, and impacts would be *not significant*.

4.11.3.2.2 Factor 2: Fire and Emergency Medical Services

Subsequent to transfer of HPS to the city, the project site would be under the jurisdiction of the city, which would be responsible for providing fire and emergency medical services. Alternative 1A would result in up to 2,650 residential units and neighborhood retail, R&D, and community services development; however, the Yosemite Slough bridge would not be constructed. Proposed development would result in a permanent resident population of 6,175 persons and an onsite temporary daytime population of 7,255 employees. Additional development, including a stadium, marina, artists' studios/art center, and parks and open space would further increase the intensity of development on the project site.

As Alternative 1A would generate the same population as Alternative 1, impacts on fire and emergency medical services would be the same as described for Alternative 1. Proposed buildings would be designed and reviewed by SFFD to ensure consistency with *San Francisco Fire Code* requirements for emergency access, sprinklers, and water systems, which would minimize demands on fire protection services. Alternative 1A would extend the existing AWSS and construct a loop system within the project site.

Similar to Alternative 1, SFFD response times (8 to 14 minutes) to the project site would not be acceptable and a new fire station would be needed at a site to ensure adequate levels of service. A new SFFD station could be accommodated on the project site on land designated for community-serving uses. Construction activities associated with the proposed public facilities, which could include a fire station, are considered part of Alternative 1A. A discussion of Alternative 1A construction impacts, including those associated with new public facilities, is provided for each resource area in other sections of Chapter 4, Environmental Consequences. No new construction impacts beyond those identified in Chapter 4 would occur with construction of a new fire station. Construction of a new SFFD facility on the project site would reduce emergency response times such that impacts would be *not significant* and no mitigation is proposed.

Under this alternative, stadium events would result in higher traffic volumes, putting emergency vehicles in competition with civilian cars for traffic lanes. An access network capable of clearing lanes for emergency vehicles when needed would alleviate this potential problem. Prior to construction, review of access strategies for game day and non-game day scenarios would be reviewed by SFFD (SFFD 2009a). In addition, a transportation management system would be implemented during football game days and special events held at the stadium. A traffic control center would be located near the stadium which would 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. Therefore, impacts would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not impact fire and emergency medical services, and impacts would be *not significant*.

4.11.3.2.3 Factor 3: Schools

As Alternative 1A would generate the same student population as Alternative 1, impacts on schools would be the same as described for Alternative 1. Alternative 1A would contribute to payment of SB 50 school impacts fees, ensuring that future facilities are provided to accommodate Alternative 1A's contribution to the projected overcapacity of SFUSD facilities. Furthermore, increases in municipal expenses associated with additional demands for educational services resulting from Alternative 1A would be offset by a proportional growth in tax revenues associated with redevelopment of HPS. Therefore, impacts to schools would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not impact schools, and impacts would be *not significant*.

4.11.3.2.4 Factor 4: Libraries

Alternative 1A would increase demands for local library services in the Bayview neighborhood. The new SFPL branches, which would all be completed prior to build-out of Alternative 1A, would accommodate associated increased demands. No additional library facilities would be required. However, space within the project site would also be dedicated to the provision of library services to supplement the expanded Bayview branch library. Impacts to libraries would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint, associated with operation of Tower Variant D for Alternative 1A, would not impact libraries, and impacts would be *not significant*.

4.11.4 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

4.11.4.1 Construction Impacts

4.11.4.1.1 Factors 1 and 2: Police Protection and Fire and Emergency Medical Services

Alternative 2 would be the same as Alternative 1 except the stadium proposed under Alternative 1 would be replaced with 2,500,000 ft^2 (232,258 m^2) of additional R&D areas emphasizing new technologies at HPS. Similar to Alternative 1, access to the project site during construction would be maintained by implementation of a TMP, ensuring adequate police and fire and emergency medical response times (refer to Section 4.1, Transportation, Traffic, and Circulation for additional details). As such, Alternative 2 construction activities would not impact SFPD or SFFD response times or require expansion or replacement of police or fire stations.

Alternative 2 construction activities would not result in increased demands on police protection services because the future developer or owner of the property would provide fencing, screening, and security lighting during site preparation and prior to construction of buildings. During non-construction hours, the site would be secured and locked and adequate security lighting would be provided (Section 2.3.2.1.9, Environmental Controls). Therefore, impacts on police protection and fire and emergency medical services during construction would be *not significant*.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option for Alternative 2 would not impact police protection or fire and emergency medical services, and impacts would be *not significant*.

4.11.4.1.2 Factors 3 and 4: Schools and Libraries

Alternative 2 construction activities would not result in an increase in population that would increase demands on the SFUSD system or library services. Also, no SFUSD or library facilities are located on the project site. All SFUSD and library services would be available to the community throughout the duration of construction. Therefore, *no impact* to school or library services would occur and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option for Alternative 2 would not impact school or libraries, and impacts would be *not significant*.

4.11.4.2 Operational Impacts

4.11.4.2.1 Factor 1: Police Protection

Subsequent to transfer of the property to the city, the project site would be under the jurisdiction of the city, which would be responsible for providing police protection services. Alternative 2 would be the same as Alternative 1 except the stadium proposed under Alternative 1 would be replaced with 2,500,000 ft^2 (232,258 m^2) of additional R&D areas emphasizing new technologies at HPS. Demands on police protection during Alternative 2 operations would be similar but slightly greater than Alternative 1 as the number of jobs associated with the additional R&D uses would increase compared to Alternative 1. Alternative 2 is anticipated to generate a total of 13,159 jobs (Table 3.11.3-1). Alternative 2 would not increase the permanent resident population compared to Alternative 1 (6,175 residents). The resident and worker population at full build-out would be 19,334. Existing patrol areas would need to be expanded to provide adequate police coverage to the project site, which would require redeployment of police services within the SFPD Bayview District. However, no additional police resources would be required to patrol the football stadium on game days or during other events.

Based on the total population at build-out, Alternative 2 would require an additional 29 police officers to provide acceptable levels of service (Table 4.11.4-1). Similar to Alternative 1, the project site is located in two of the five sectors within the Bayview District, both of which have been identified as high demand areas (i.e., areas with high volumes of Priority A calls). While it is unlikely that 29 new officers would be needed at the outset of project development, as development would occur over a 20-year time period, some redistribution of police officers in the southeastern portion of the city would be required to support proposed development.

Table 4.11.4-1. Citywide Number of Police Officers and Alternative 2 Demands

	Population	***Police Officers***
	Citywide (2005)	
Residents	799,302	
Employees	552,167	
Total	**1,351,469**	**2,033**
Ratio (officer to population)	1:665	
	Alternative 2 (2032)	
Residents	6,175	
Employees	13,159	
Total	**19,334**	**29**
Ratio (officer to population)	1:663	

Note:
The projected number of police officers is rounded up, and most closely reflects the 1:665 ratio of Alternative 1.
Sources:
The population and households data reported for San Francisco are 2005 data (Personal communication, Rahaim, J. 2009); PSSG 2008.

As with Alternative 1, additional SFPD personnel of this magnitude (i.e., 29 officers) needed to support Alternative 2 would require modifications to the existing Bayview Station or construction of a new station. According to SFPD, there is limited excess capacity at the existing Bayview Station, and the station would not be able to accommodate all 29 of the additional police officers without modification to the existing station or the construction of a new facility (personal communication, Loftus, 2009). The amount of space that would be needed to support the additional police officers has not yet been determined. Construction of a new SFPD facility on the project site or modifications to the existing Bayview Station would be funded by the future developer or owner of the property and offset by property taxes.

In the event SFPD determines that reconfiguration of the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility could be constructed within the project site on land designated for community-serving uses. As part of Alternative 2, up to 50,000 gft^2 (4 645.152 gm^2) would be designated for community-serving uses. This analysis assumes that staffing associated with Alternative 2 could be accommodated within the project site. Construction activities associated with the proposed public facilities, which could include a police station, are considered part of Alternative 2. A discussion of Alternative 2 construction impacts, including those associated with new public facilities, is provided for each resource area in other sections of Chapter 4. No new construction impacts beyond those identified in Chapter 4 would occur with construction of a new police station. Therefore, impacts on police protection would be *not significant*. Since impacts on police protection would not be significant, no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 2, would not impact police protection, and impacts would be *not significant*.

4.11.4.2.2 Factor 2: Fire and Emergency Medical Services

Subsequent to transfer of HPS to the city, the project site would be under the jurisdiction of the city, which would be responsible for providing fire and emergency medical services. Alternative 2 would generate additional jobs compared to Alternative 1. Also, elimination of the stadium would reduce impacts on fire and emergency medical services. The increase in onsite population, combined with an increase in the intensity of development at the project site, would result in new demands for fire protection and emergency medical services.

Building Safety

Similar to Alternative 1, proposed buildings would be designed and reviewed by SFFD to ensure consistency with *San Francisco Fire Code* requirements for emergency access, sprinklers, and water systems, reducing demands on fire protection services. In addition, development would include expansion of the AWSS to provide water infrastructure for firefighting activities. Therefore, impacts would be *not significant* and no mitigation is proposed.

Response Time

Portions of the project site would be distant from existing fire stations, including those nearest to the site (Stations 44 and 17), which could result in the SFFD response times of 8 minutes to 14 minutes to access the site in the event of an emergency. Similar to Alternative 1, a new SFFD station could be accommodated on the project site on land designated for community-serving uses. Construction activities associated with the proposed public facilities, which could include a fire station, are considered part of Alternative 2. A discussion of Alternative 2 construction impacts, including those associated with new public facilities, is provided for each resource area in other sections of Chapter 4, Environmental Consequences. No new construction impacts beyond those identified in Chapter 4 would occur with construction of a new fire station. Construction of a new SFFD facility on the project site would reduce emergency response times such that impacts would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 2 would not impact fire and emergency medical services, and impacts would be *not significant*.

4.11.4.2.3 Factor 3: Schools

As Alternative 2 would generate the same student population as Alternative 1, impacts on schools would be the same as described for Alternative 1. Alternative 2 would contribute to payment of SB 50 school impacts fees, ensuring that future facilities are provided to accommodate this alternative's contribution to the projected overcapacity of SFUSD facilities. Furthermore, increases in municipal expenses associated with additional demands for educational services resulting from Alternative 2 would be offset by a proportional growth in tax revenues associated with redevelopment of HPS. Therefore, impacts to schools would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 2, would not impact schools, and impacts would be *not significant*.

4.11.4.2.4 Factor 4: Libraries

As Alternative 2 would generate the same residential population as Alternative 1, impacts on libraries would be the same as described for Alternative 1. The new SFPL branches, which would all be completed prior to build-out of Alternative 2, would accommodate associated increased demands. Impacts to libraries would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 2, would not impact libraries, and impacts would be *not significant*.

4.11.5 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

4.11.5.1 Construction Impacts

4.11.5.1.1 Factors 1 and 2: Police Protection and Fire and Emergency Medical Services

Under this alternative, the stadium proposed under Alternative 1 would be replaced with additional housing and R&D areas emphasizing new technologies at HPS. Access to the project site during construction would be maintained by implementation of a TMP, ensuring adequate police and fire and emergency medical response times (refer to Section 4.1, Transportation, Traffic, and Circulation for additional details). Alternative 2A construction activities would not impact SFPD or SFFD response times, and/or require expansion or replacement of police or fire stations. In addition, Alternative 2A construction activities would not result in increased demands on police protection services because the future developer or owner of the property would provide fencing, screening, and security lighting during site preparation and prior to construction of buildings. During non-construction hours, the site would be secured and locked and adequate security lighting would be provided (Section 2.3.2.1.9, Environmental Controls). Therefore, impacts on police protection and fire and emergency medical services during construction would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option for Alternative 2A, would not impact police protection or fire and emergency medical services, and impacts would be *not significant*.

4.11.5.1.2 Factors 3 and 4: Schools and Libraries

Alternative 2A construction activities would not result in an increase in population that would increase demands on the SFUSD system or library services. No SFUSD or library facilities are located on the project site. All SFUSD facilities and library services would be available to the community throughout the duration of construction. Therefore, *no impact* to school or library services would occur and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option for Alternative 2A, would not impact schools or libraries, and impacts would be *not significant*.

4.11.5.2 Operational Impacts

4.11.5.2.1 Factor 1: Police Protection

Subsequent to transfer of the property to the city, the project site would be under the jurisdiction of the city, which would be responsible for providing police protection services. Demands on police protection during Alternative 2A operations would be similar but slightly greater than Alternative 1 as the number of residents and employees would increase compared to Alternative 1. Alternative 2A would generate a total population of 18,174 persons (residents and employees). However, no additional police resources would be required to patrol the football stadium on game days. At buildout, Alternative 2A would result in a demand of 27 additional police officers to provide a comparable level of service in the Bayview District. Existing patrol areas would need to be expanded to provide adequate police coverage to the project site. As with Alternative 1, if the SFPD determines that reconfiguration of the Bayview Station would not be sufficient to accommodate the additional officers, a new station or facility could be constructed within the project site on land designated for community-serving uses. As Alternative 2A includes community service uses that could be used for police protection services, and as police services are not tied to a specific station, the SFPD would be able to maintain acceptable levels of service during Alternative 2A operations. Therefore, impacts on police protection would be *not significant*. Since impacts on police protection would not be significant, no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 2A would not impact police protection, and impacts would be *not significant*.

4.11.5.2.2 Factor 2: Fire and Emergency Medical Services

Subsequent to transfer of HPS to the city, the project site would be under the jurisdiction of the city, which would be responsible for providing fire and emergency medical services. Demands on fire and emergency medical services during Alternative 2A operations would be similar but slightly greater than Alternative 1 as the number of jobs associated with the additional R&D uses and residents associated with additional housing units would increase compared to Alternative 1. Similar to Alternative 1, proposed buildings would be designed and reviewed by SFFD to ensure consistency with *San Francisco Fire Code* requirements for emergency access, sprinklers, and water systems, which would minimize demands on fire protection services. Alternative 2A would extend the existing AWSS and construct a loop system within the project site.

Similar to Alternative 1, SFFD response times (8 to 14 minutes) to the project site would not be acceptable and a fire station would be needed at a site to ensure adequate levels of service. A new SFFD station could be accommodated on the project site on land designated for community-serving uses. Construction activities associated with the proposed public facilities, which would include a fire station, are considered part of Alternative 2A. A discussion of Alternative 2A construction impacts, including those associated with new public facilities, is provided for each resource area in other sections of Chapter 4. No new construction impacts beyond those identified in Chapter 4 would occur with construction of a new fire station. Construction of a new SFFD facility on the project site would reduce emergency response times such that impacts would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 2A, would not impact fire and emergency medical services, and impacts would be *not significant*.

4.11.5.2.3 Factor 3: Schools

Alternative 2A would have similar but slightly greater impacts on schools than those described for Alternative 1 because it would generate a greater student population than Alternative 1. Alternative 2A would contribute to payment of SB 50 school impacts fees, ensuring that future facilities are provided to accommodate Alternative 2A's contribution to the projected overcapacity of SFUSD facilities. Furthermore, increases in municipal expenses associated with additional demands for educational services resulting from Alternative 2A would be offset by a proportional growth in tax revenues associated with redevelopment of HPS. Therefore, impacts to schools would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 2A, would not impact schools, and impacts would be *not significant*.

4.11.5.2.4 Factor 4: Libraries

Impacts on libraries would be similar but slightly greater than those described for Alternative 1. The new SFPL branches, which would all be completed prior to build-out of Alternative 2A, would accommodate associated increased demands. No additional library facilities would be required. However, space within the project site would also be dedicated to the provision of library services to supplement the expanded Bayview branch library. Impacts to libraries would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 2A, would not impact libraries, and impacts would be *not significant*.

4.11.6 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

4.11.6.1 Construction Impacts

4.11.6.1.1 Factors 1 and 2: Police Protection and Fire and Emergency Medical Services

Alternative 3 would be the same as Alternative 1 except the stadium proposed under Alternative 1 would be replaced with 1,350 additional residential units. Access to the project site during construction would be maintained by implementation of a TMP, ensuring adequate police and fire and emergency medical response times (refer to Section 4.1, Transportation, Traffic, and Circulation, for additional details). Alternative 3 construction activities would not impact SFPD or SFFD response times or require expansion or replacement of police or fire stations. In addition, Alternative 3 construction activities would not result in increased demands on police protection services because the future developer or owner of the property would provide fencing, screening, and security lighting during site preparation and prior to construction of buildings. During non-construction hours, the site would be secured and locked and adequate security lighting would be provided (Section 2.3.2.1.9, Environmental Controls). Therefore, impacts on police protection and fire and emergency medical services during construction would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option for Alternative 3, would not impact police protection or fire and emergency medical services, and impacts would be *not significant*.

4.11.6.1.2 Factors 3 and 4: Schools and Libraries

Construction of Alternative 3 would not result in an increase in population that would increase demands on the SFUSD system or library services. No SFUSD or library facilities are located on the project site. All SFUSD facilities and library services would be available to the community throughout the duration of construction activities. Therefore, *no impact* to school or library services during construction of Alternative 3 would occur and no mitigation is proposed.

Minor changes to the project footprint associated with construction of Tower Variant D or the Building Preservation option for Alternative 3, would not impact schools and libraries, and impacts would be *not significant*.

4.11.6.2 Operational Impacts

4.11.6.2.1 Factor 1: Police Protection

Subsequent to transfer of the property to the city, the project site would be under the jurisdiction of the city, which would be responsible for providing police protection services. Demands on police protection during Alternative 3 operations would be similar but slightly greater than Alternative 1 as the number of residents would increase compared to Alternative 1. Proposed development of 4,000 housing units (9,320 residents) in addition to the onsite temporary daytime population of 6,956 employees would result in a police demand of 25 additional officers (Table 4.11.6-1). Existing patrol areas would need to be expanded to provide adequate police coverage to the project site, which would require redeployment of police services within the SFPD Bayview District. However, no additional police resources would be required to patrol the football stadium on game days.

Table 4.11.6-1. Citywide Number of Police Officers and Alternative 3 Demands

	Population	***Police Officers***
Citywide (2005)		
Residents	799,302	
Employees	552,167	
Total	**1,351,469**	**2,033**
Ratio (officer to population)	1:665	
Alternative 3 (2023)		
Residents	9,320	
Employees	7,008	
Total	**16,328**	**25**
Ratio (officer to population)	1:665	

Note:
The projected number of police officers is rounded up, and most closely reflects the 1:665 ratio of Alternative 1.
Sources:
The population and households data reported for San Francisco are 2005 data (Personal communication, Rahaim, J. 2009); PSSG 2008.

As with Alternative 1, additional SFPD personnel of this magnitude (i.e., 25 officers) needed to support Alternative 3 would require modifications to the existing Bayview Station or construction of a new station. According to SFPD, there is limited excess capacity at the existing Bayview Station, and the station would not be able to accommodate all 25 of the additional police officers without modification to the existing station or the construction of a new facility (personal communication, Loftus 2009). The amount of space that would be needed to support the additional police officers has not yet been determined. Construction of a new SFPD facility on the project site or modifications to the existing Bayview Station would be funded by the future developer or owner of the property and offset by property taxes.

In the event SFPD determines that reconfiguration of the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility could be constructed within the project site on land designated for community-serving uses. As part of Alternative 3, up to 50,000 gft^2 (4,645 gm^2) would be designated for community-serving uses. With the construction of a new facility, or suitable modifications to the Bayview Station, the SFPD would have adequate space to accommodate the additional police officers needed to maintain the SFPD's existing level of service. This analysis assumes that staffing associated with Alternative 3 could be accommodated within the project site. Construction activities associated with the proposed public facilities, which could include a police station, are considered part of Alternative 3. A discussion of Alternative 3 construction impacts, including those associated with new public facilities, is provided for each resource area in other sections of Chapter 4. No new construction impacts beyond those identified in Chapter 4 would occur with construction of a new police station. Therefore, impacts on police protection would be *not significant*. Since impacts on police protection would not be significant, no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 3, would not impact police protection, and impacts would be *not significant*.

4.11.6.2.2 Factor 2: Fire and Emergency Medical Services

Subsequent to transfer of HPS to the city, the project site would be under the jurisdiction of the city, which would be responsible for providing fire and emergency medical services. Demands on fire and emergency medical services during Alternative 3 operations would be similar but slightly greater than Alternative 1 as the number of residents would increase compared to Alternative 1. Proposed buildings would be designed and reviewed by SFFD to ensure consistency with *San Francisco Fire Code* requirements, which would minimize demands on fire protection services. Similar to Alternative 1, Alternative 3 would extend the existing AWSS and construct a loop system within the project site.

SFFD response times (8 to 14 minutes) to the project site would not be acceptable and a fire station would be needed at a site to ensure adequate levels of service. A new SFFD station could be accommodated on the project site on land designated for community-serving uses. Construction activities associated with the proposed public facilities, which would include a fire station, are considered part of Alternative 3. A discussion of Alternative 3 construction impacts, including those associated with new public facilities, is provided for each resource area in other sections of Chapter 4, Environmental Consequences. No new construction impacts beyond those identified in Chapter 4 would occur with construction of a new fire station. Construction of a new SFFD facility on the project site would reduce emergency response times such that impacts would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 3, would not impact fire and emergency medical services, and impacts would be *not significant*.

4.11.6.2.3 Factor 3: Schools

As Alternative 3 would generate a larger student population compared to Alternative 1, impacts on schools would be similar but slightly greater than those described for Alternative 1. Alternative 3 would generate approximately 812 new students (Table 4.11.6-2).

Table 4.11.6-2 Alternative 3 Buildout Public School Enrollment Compared to SFUSD Capacity

Analysis Area	Elementary School (Grades K–5)	Middle School (Grades 6–8)	High School (Grades 9–12)	Total
Project Site[a]	**375**	**187**	**250**	**812**
2030 Citywide Enrollment[b]	33,036	16,518	22,024	71,573
2008 SFUSD Capacity[c]	29,260	11,700	17,575	63,835
2030 Citywide Shortfall	3,776	4,818	4,449	7,738

Notes:

The number of new students in the project site was determined by multiplying the number of proposed housing units by the student generation factor of 0.203. The number of students was distributed evenly by grade.

a. For the project site, 4,000 residential units multiplied by 0.203 SFUSD student generation rate would result in 812 students. 812 students divided by 13 grade levels would result in 62.5 students per grade. 62.5 students per grade level multiplied by six grade levels for elementary school equals 375; multiplied by three grade levels for middle school equals 187; and by four grade levels for high school equals 250. Totals may not equal due to rounding.

b. 2030 enrollment was calculated as follows: the 2008/09 SFUSD enrollment was divided by the 2005 citywide school-age population (5–19 years old), which yields a ratio of 0.558. Similarly, the 2030 citywide school-age population (5–19 years old) was multiplied by the ratio of 0.558 to yield a projected 2030 SFUSD enrollment of 71,573. Enrollment was distributed evenly across the grade levels. Totals may not equal due to rounding.

c. The total includes capacity for 5,300 students in varying grade levels in alternative schools and public charter schools.

Sources: ABAG 2007; PBS&J 2009b.

Alternative 3 would contribute to payment of SB 50 school impacts fees, ensuring that future facilities are provided to accommodate this alternative's contribution to the projected overcapacity of SFUSD facilities. Furthermore, increases in municipal expenses associated with additional demands for educational services resulting from Alternative 3 would be offset by a proportional growth in tax revenues associated with redevelopment of HPS. Therefore, impacts to schools would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 3, would not impact schools, and impacts would be *not significant*.

4.11.6.2.4 Factor 4: Libraries

As Alternative 3 would generate a larger residential population compared to Alternative 1, impacts on libraries would be similar but slightly greater than those described for Alternative 1. The new SFPL branches, which would be completed prior to build-out of Alternative 3, would accommodate associated increased demands. No additional library facilities would be required. However, space within the project site would also be dedicated to the provision of library services to supplement the expanded Bayview branch library. Impacts to libraries would be *not significant* and no mitigation is proposed.

Minor changes to the project footprint associated with operation of Tower Variant D or the Building Preservation option for Alternative 3, would not impact library services, and impacts would be *not significant*.

4.11.7 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

4.11.7.1 Construction Impacts

4.11.7.1.1 Factors 1 and 2: Police Protection and Fire and Emergency Medical Services

Under this alternative, the stadium, Yosemite Slough bridge, marina, and in-water/shoreline improvements associated with the marina would not be constructed. Residential and commercial development would be reduced compared to Alternative 1. Similar to Alternative 1, access to the project site during construction would be maintained by implementation of a TMP, ensuring adequate police and fire and emergency medical response times (refer to Section 4.1, Transportation, Traffic, and Circulation, for additional details). Therefore, Alternative 4 construction activities would not impact SFPD or SFFD response times, and/or require expansion or replacement of police or fire stations. In addition, Alternative 4 construction activities would not result in increased demands on police protection services because the future developer or owner of the property would provide fencing, screening, and security lighting during site preparation and prior to construction of buildings. During non-construction hours, the site would be secured and locked and adequate security lighting would be provided (Section 2.3.2.1.9, Environmental Controls). Therefore, impacts on police protection and fire and emergency medical services during construction would be *not significant* and no mitigation is proposed.

4.11.7.1.2 Factors 3 and 4: Schools and Libraries

Alternative 4 construction activities would not result in an increase in population that would increase demands on the SFUSD system or library services. No SFUSD or library facilities are located on the project site. All SFUSD facilities and library services would be available to the community throughout the duration of construction activities. Therefore, *no impact* to school or library services during construction of Alternative 4 would occur and no mitigation is proposed.

4.11.7.2 Operational Impacts

4.11.7.2.1 Factor 1: Police Protection

Under Alternative 4, the project site would be under the jurisdiction of the city, which would be responsible for providing police protection services. Implementation of Alternative 4 would result in a permanent resident population of 4,730 persons and an onsite temporary daytime population of 4,846 employees. Alternative 4 would result in a potential increase in the need for additional police officers to provide a comparable level of service in the Bayview District. Some redistribution of police officers in the southeastern portion of the city would be required to support Alternative 4 development. If the SFPD determines that modifications to the Bayview Station would not be sufficient to accommodate additional officers, a new station or facility could be constructed within the project site. Construction of a new SFPD facility on the project site or modifications to the existing Bayview Station would be funded by the future developer or owner of the property and offset by property taxes. Construction activities associated with the proposed public facilities, which could include a police station, are considered part of Alternative 4. A discussion of Alternative 4 construction impacts, including those associated with new public facilities, is provided for each resource area in other sections of Chapter 4. No new construction impacts beyond those identified in Chapter 4 would occur with construction of a new police station. Therefore, impacts on police protection would be *not significant*. Since impacts on police protection would not be significant, no mitigation is proposed.

4.11.7.2.2 Factor 2: Fire and Emergency Medical Services

Subsequent to transfer of HPS to the city, the project site would be under the jurisdiction of the city, which would be responsible for providing fire and emergency medical services. Under Alternative 4, demands on fire and emergency medical services during operations would be less than Alternative 1 as there would be fewer employees and residents due to reduced R&D, commercial, and residential development. Proposed buildings would be designed and reviewed by SFFD to ensure consistency with *San Francisco Fire Code* requirements, which would minimize demands on fire protection services. Alternative 4 would extend the existing AWSS and construct a loop system within the project site. As with Alternative 1, SFFD response times (8 to 14 minutes) to the project site would not be acceptable and a fire station would be needed at a site to ensure adequate levels of service. A new SFFD station could be accommodated on the project site on land designated for community-serving uses. Construction activities associated with the proposed public facilities, which could include a fire station, are considered part of Alternative 4. Construction of a new SFFD facility on the project site would reduce emergency response times such that impacts would be *not significant* and no mitigation is proposed.

4.11.7.2.3 Factor 3: Schools

As Alternative 4 would generate a reduced student population compared to Alternative 1, impacts on schools would be similar but slightly less than those described for Alternative 1. Alternative 4 would contribute to payment of SB 50 school impacts fees, ensuring that future facilities are provided to accommodate this alternative’s contribution to the projected overcapacity of SFUSD facilities. Furthermore, increases in municipal expenses associated with additional demands for educational services resulting from Alternative 4 would be offset by a proportional growth in tax revenues associated with redevelopment of HPS. Therefore, impacts to schools would be *not significant* and no mitigation is proposed.

4.11.7.2.4 Factor 4: Libraries

Proposed development associated with Alternative 4 would increase demands on local library services in the Bayview neighborhood. The new SFPL branches, which would be completed prior to build-out of Alternative 4, would accommodate associated increased demands. No additional library facilities would be required. However, space within the project site would also be dedicated to the provision of library services to supplement the expanded Bayview branch library. Impacts to libraries would be *not significant* and no mitigation is proposed.

4.11.8 No Action Alternative

Under the No Action Alternative, the project site would not be disposed of by DoN for subsequent reuse and would remain as a closed federal property under caretaker status. Existing conditions would remain as described in Section 3.11, Public Services, and public service demands would remain unchanged. Therefore, *no impacts* on public services would occur under the No Action Alternative.

4.11.9 Mitigation

The proposed action and alternatives would not result in significant impacts to public services. No mitigation is proposed.

4.12 Cultural Resources

4.12.1 Methodology

This section examines the potential impacts of the project alternatives on cultural and paleontological resources. It identifies project-level impacts, as well as feasible mitigation measures that could reduce or avoid the identified impacts.

4.12.1.1 Significance Factors

Factors considered in determining whether an alternative would have significant impacts on cultural and paleontological resources include the extent or degree to which the implementation of an alternative would:

Factor 1 Cause a substantial adverse change in the significance of a historic resource (Buildings and Structures);

Factor 2 Cause a substantial adverse change in the significance of an archaeological resource, or disturb any human remains, including those interred outside of formal cemeteries; and/or

Factor 3 Directly or indirectly destroy a unique paleontological resource or paleontological site.

Significant impacts to cultural resources could occur from, but are not limited to, physical destruction of or damage to all or part of the property; alteration of a property that is not consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR 68) and applicable guidelines; removal of the property from its historic location; change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance; introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features; neglect of a property which causes its deterioration; or transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance (36 CFR 800.5). If any of these criteria are met, the impact would be considered significant.

4.12.1.2 Analytic Method

The impact analysis for cultural resources is based primarily on the information contained in the following reports: *Historic Context and Inventory and Evaluation of Buildings and Structures, Hunters Point Shipyard, San Francisco, California* (JRP Historical Consulting Services 1997); and *Archaeological Inventory and Assessment of the Hunters Point Shipyard, San Francisco County, California* (Hamusek-McGann, *et al*. 1998).

The paleontological resource impact analysis is based on database searches at the University of California Museum of Paleontology; the American Museum of Natural History, Division of Paleontology; the North American Mammalian Paleofaunal Database, in July 2009; and a review of published studies by the U.S. Geological Survey and other agencies and organizations, to identify previously reported fossil finds in the vicinity of the project site or in the same geologic units that occur at the project site.

4.12.2 Navy Disposal

The disposal of the Hunters Point Commercial Drydock Historic District and Drydock 4 (historic properties eligible for listing on the National Register) would have no direct physical effect on these historic resources. The adverse effect to historic properties caused by the disposal of HPS has been addressed under an MOA that was executed on 11 January 2000 among the DoN, the Advisory Council on Historic Preservation, and the California SHPO, and concurred by the city and the SFRA (see Section 3.12.3, Regulatory Framework, for more details). The MOA identifies the actions to be taken by the DoN before property transfer and by the city and SFRA after transfer to ensure appropriate treatment of these cultural resources. Implementation of the MOA compensates for that loss of federal protection. The direct impacts of reuse, described below, would be the indirect impacts of disposal.

4.12.3 Alternative 1: Stadium Plan Alternative

4.12.3.1 Construction Impacts

4.12.3.1.1 Factor 1: Historic Resources (Buildings and Structures)

Historic resources at HPS include the National Register-eligible Hunters Point Commercial Drydock Historic District. Contributing elements to the historic district include Drydock 2, Drydock 3, and Buildings 140, 204, 205, and 207. The project site also includes Drydock 4, which is eligible for listing on the National Register as an individual building.

Alternative 1 proposes to retain Drydock 4 and the contributing elements of the National Register-eligible Hunters Point Commercial Drydock Historic District. Drydocks 2, 3, and 4 and Buildings 140, 204, 205, and 207 would be rehabilitated using the *Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*. Page & Turnbull (2009), architects and historic resource consultants, reviewed the proposed treatment and rehabilitation of Drydocks 2, 3, and 4. The treatments would include repair of concrete surfaces of the drydocks and addition of guardrails along their perimeter. Page & Turnbull found that the proposed treatments would provide a methodology for resolving severe deterioration issues, and ultimately provide for the longevity of the historic resources; the treatments would be consistent with the Secretary of the Interior's Standards for Rehabilitation (Page & Turnbull Memorandum 2009, provided in Appendix V1 of the CP-HPS DEIR [SFRA 2009]). Heritage Park is proposed at Drydocks 2 and 3 and would include interpretive display elements related to the history of HPS. Therefore, *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D, would not cause a substantial adverse change in the significance of a historic resource, and *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur.

4.12.3.1.2 Factor 2: Archaeological Resources

Research indicates that archaeological resources may be found on the project site and that these resources could have important research value. Expected archaeological resources could contribute significant data to various research themes, including: 1) the spatial organization and historic development of Chinese Shrimp Camps; 2) effects, adaptations, and resistance of the shrimp camps to anti-Chinese fishing legislation (1885-1930s); 3) spatial organization of shipyards and development of local traditions of boat building technology, including that of the scow schooner and Chinese junks; 4) the development, changing function, and inter-settlement relationships of prehistoric shellmounds; 5) comparative spatial organization of shellmound sites; 6) changes in prehistoric faunal and biotic exploitation practices; 7) prehistoric changes in social stratification; and 8) the relationship between Hunters Point-Bayview and South of Market area prehistoric settlements. Any archaeological resources (e.g., prehistoric shellmounds [CA-SFR-11, CA-SFR-12, CA-SFR-13, and CA-SFR-14], Chinese Shrimp Camps, or maritime sites) that are presently covered by existing development would remain buried and undisturbed unless and until the site is redeveloped. Although the likelihood of encountering intact deposits is relatively low due to historic and modern construction activities, any substantial adverse change in the significance of an archaeological resource by construction-related activities would be a significant impact. Based on a reasonable presumption that archaeological resources may be present within the project site, DoN has identified the following measure that can assist the new property owner(s) in mitigating the potential for significant impacts on archaeological resources.

Mitigation Measure

Mitigation 1. Archaeological Testing, Monitoring, and Mitigation Program. The future developer or owner of the property would be responsible for implementing and funding an Archaeological Testing, Monitoring, and Mitigation Program by a qualified archaeological consultant with expertise in California prehistoric and urban historic archaeology. The Archaeological Testing, Monitoring, and Mitigation Program would be implemented prior to the initiation of construction activities, as specified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]). The purpose of the archaeological testing program would be to determine to the extent possible the presence or absence of archaeological resources within the proposed construction area. If, based on the archaeological testing program, the archaeological consultant finds that significant archaeological resources are present, additional measures that may be undertaken include, but are not necessarily limited to, additional archaeological testing, archaeological monitoring, and/or an archaeological data recovery program. Appropriate mitigation would be determined in consultation with the San Francisco Historic Preservation Commission and the San Francisco Planning Department.

The archaeological consultant's work would be conducted in accordance with the requirements of the Archaeological Research Design and Treatment Plan for the Bayview Waterfront Project (Archeo-Tec 2009) at the direction of the city's Environmental Review Officer (ERO). All plans and reports prepared by the consultant would be submitted first and directly to the ERO for review and comment.

With implementation of **Mitigation 1**, *no significant residual impacts* on archaeological resources would occur from construction activities associated with Alternative 1.

Minor changes to the project footprint, associated with construction of Tower Variant D, would not cause a substantial adverse change in the significance of an archaeological resource with implementation of **Mitigation 1**, and *no significant residual impacts* on archaeological resources would occur.

4.12.3.1.3 Factor 3: Paleontological Resources

No impacts to paleontological resources would occur during construction in the Franciscan Complex serpentinite deposits (see Figure 3.8.3-1) because it is unlikely that those deposits would contain paleontological resources. However, sedimentary rocks of the Franciscan Complex, such as sandstone, shale, and chert, have produced significant fossils important for understanding the age, depositional environments, and tectonic history of the San Francisco Bay Area. Fossil remains discovered in sedimentary rocks of the Franciscan Complex during construction could be scientifically important and significant. Although no fossils have been reported from the project site, the presence of Franciscan sedimentary rocks on the flanks of Hunters Point (see Figure 3.8.3-1) indicates the possibility of fossils being discovered during construction-related excavation.

No paleontological impacts would occur during construction in the artificial fill (see Figure 3.8.3-1) because it is unlikely that those deposits would contain paleontological resources. However, the Bay Mud underlying portions of the fill at depth is expected to have a high sensitivity because it is possible, and even likely, that those materials would contain paleontological resources. Fossil fragments from the Bay Mud have been recovered near Islais Creek, located northwest of the project site. The presence of the Bay Mud under the fill around Hunters Point in the project site indicates the possibility of fossils being discovered during construction-related excavation and pile driving. Any impacts on a unique paleontological resource or paleontological site by construction-related activities would be a significant impact. Based on a reasonable presumption that paleontological resources may be present within the project site, DoN has identified the following measure that can assist the new property owner(s) in mitigating impacts.

Mitigation Measure

Mitigation 2. Paleontological Resources Monitoring and Mitigation Program. The future developer or owner of the property would be responsible for implementing and funding a Paleontological Resources Monitoring and Mitigation Program by a qualified paleontological consultant, having expertise in California paleontology. The monitoring program would be implemented concurrent with construction activities, as specified in the FEIR (No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]). Monitoring would be completed in the areas where construction activities have the potential to disturb previously undisturbed native sediment or sedimentary rocks. Monitoring need not be conducted in areas where the ground has been previously disturbed, in areas of artificial fill, in areas underlain by non-sedimentary rocks (e.g., serpentinite or greenstone), or in areas where exposed sediment would be buried but otherwise undisturbed. However, in the event that excavations or pile driving is completed into undisturbed sedimentary deposits underlying artificial fill or disturbed areas (most notably the Bay Mud deposits), monitoring would be completed.

The paleontological consultant's work would be conducted at the direction of the city's ERO. All plans and reports prepared by the consultant would be submitted first and directly to the ERO for review and comment.

With implementation of **Mitigation 2**, *no significant residual impacts* on paleontological resources would occur from construction activities associated with Alternative 1.

Minor changes to the project footprint, associated with construction of Tower Variant D, would not directly or indirectly destroy a unique paleontological resource or paleontological site with implementation of **Mitigation 2**, and *no significant residual impacts* on paleontological resources would occur.

4.12.3.2 Operational Impacts

As no ground disturbance or demolition would occur during operations, historic, archaeological, and paleontological resources would not be impacted. Because there would be *no impacts*, no mitigation is proposed. See section 4.12.3.1 for a discussion of reuse and rehabilitation of historic buildings.

Similarly, there would be no ground disturbance or demolition related to operations under Tower Variant D, and, therefore, there would be *no impacts* on historic, archaeological, and paleontological resources.

4.12.4 Alternative 1A: Stadium Plan/No-Bridge Alternative

Alternative 1A (Stadium Plan/No-Bridge Alternative) would be the same as Alternative 1 (Stadium Plan Alternative) except that the Yosemite Slough bridge would not be constructed. Construction and operational impacts related to cultural and paleontological resources would be similar to Alternative 1, as discussed below, because the type of development and associated construction activities are predominantly the same, although the exact area of ground disturbance would differ slightly. Additionally, operational activities would be the same as those under Alternative 1, with the exception of the absence of the Yosemite Slough bridge.

4.12.4.1 Construction Impacts

4.12.4.1.1 Factor 1: Historic Resources (Buildings and Structures)

As described for Alternative 1, historic resources at HPS include the National Register-eligible Hunters Point Commercial Drydock Historic District. Contributing elements to the historic district include Drydock 2, Drydock 3, and Buildings 140, 204, 205, and 207. The project site also includes Drydock 4, which is eligible for listing on the National Register as an individual building.

As with Alternative 1, Alternative 1A proposes to retain Drydock 4 and the contributing elements of the National Register-eligible Hunters Point Commercial Drydock Historic District. Drydocks 2, 3, and 4 and Buildings 140, 204, 205, and 207 would be rehabilitated using the *Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*. Therefore, *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D, would not cause a substantial adverse change in the significance of a historic resource, and *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur.

4.12.4.1.2 Factor 2: Archaeological Resources

Research indicates that archaeological resources may be found on the project site and that these resources could have important research value. As described for Alternative 1, archaeological resources, (e.g., prehistoric shellmounds [CA-SFR-11, CA-SFR-12, CA-SFR-13, and CA-SFR-14], Chinese Shrimp Camps, or maritime sites) may be present within the project site area covered by existing development, and these would remain buried and undisturbed unless and until the site is redeveloped. Although the likelihood of encountering intact deposits is relatively low due to historic and modern construction activities, any substantial adverse change in the significance of an archaeological resource by construction-related activities would be a significant impact. Based on a reasonable presumption that archaeological resources may be present within the project site, implementation of **Mitigation 1** (archaeological resources) discussed under Alternative 1 would be required to mitigate the potential for significant impacts on archaeological resources.

Mitigation Measure

With implementation of **Mitigation 1**, *no significant residual impacts* on archaeological resources would occur from construction-related impacts on buried archaeological resources.

Minor changes to the project footprint, associated with construction of Tower Variant D, would not cause a substantial adverse change in the significance of an archaeological resource with implementation of **Mitigation 1** (archaeological resources), and *no significant residual impacts* on archaeological resources would occur.

4.12.4.1.3 Factor 3: Paleontological Resources

As described for Alternative 1, fossil remains discovered in sedimentary rocks of the Franciscan Complex during construction could be scientifically important and significant. In addition, the Bay Mud underlying portions of the fill at depth is expected to have a high sensitivity because it is possible, and even likely, that those materials would contain paleontological resources. Any impacts on a unique paleontological resource or paleontological site by construction-related activities would be a significant impact. Based on a reasonable presumption that paleontological resources may be present within the project site, implementation of **Mitigation 2** (paleontological resources) discussed under Alternative 1 would be required to mitigate potential impacts.

Mitigation Measure

With implementation of **Mitigation 2**, *no significant residual impacts* on paleontological resources would occur in association with Alternative 1A construction.

Minor changes to the project footprint, associated with construction of Tower Variant D, would not directly or indirectly destroy a unique paleontological resource or paleontological site with implementation of **Mitigation 2** (paleontological resources), and *no significant residual impacts* on paleontological resources would occur.

4.12.4.2 Operational Impacts

As no ground disturbance or demolition would occur during operations, historic, archaeological, and paleontological resources would not be impacted. Because there would be *no impacts*, no mitigation is proposed. See section 4.12.4.1 for a discussion of reuse and rehabilitation of historic buildings.

Similarly, there would be no ground disturbance or demolition related to operations under Tower Variant D, and, therefore, there would be *no impacts* on historic, archaeological, and paleontological resources.

4.12.5 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

Alternative 2 would replace the football stadium, as proposed as part of Alternative 1, with an additional 2.5 million ft^2 (232,258 m^2) of R&D space. Construction and operational impacts related to cultural and paleontological resources would be similar to Alternative 1, as discussed below, because the type of development and associated construction activities are predominantly the same, although the exact area of ground disturbance would differ between the two alternatives. Additionally, operational activities are the same as those under Alternative 1, with the exception of the absence of the football stadium.

4.12.5.1 Construction Impacts

4.12.5.1.1 Factor 1: Historic Resources (Buildings and Structures)

As described for Alternative 1, historic resources at HPS include the National Register-eligible Hunters Point Commercial Drydock Historic District. Contributing elements to the historic district include Drydock 2, Drydock 3, and Buildings 140, 204, 205, and 207. The project site also includes Drydock 4, which is eligible for listing on the National Register as an individual building.

As with Alternative 1, Alternative 2 proposes to retain Drydock 4 and the contributing elements of the National Register-eligible Hunters Point Commercial Drydock Historic District. Drydocks 2, 3, and 4 and Buildings 140, 204, 205, and 207 would be rehabilitated using the *Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*. Therefore, *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause a substantial adverse change in the significance of a historic resource, and *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur.

4.12.5.1.2 Factor 2: Archaeological Resources

Research indicates that archaeological resources may be found on the project site and that these resources could have important research value. As described for Alternative 1, archaeological resources, (e.g., prehistoric shellmounds [CA-SFR-11, CA-SFR-12, CA-SFR-13, and CA-SFR-14], Chinese Shrimp Camps, or maritime sites) may be present within the project site area covered by existing development, and these would remain buried and undisturbed unless and until the site is redeveloped. Although the likelihood of encountering intact deposits is relatively low due to historic and modern construction activities, any substantial adverse change in the significance of an archaeological resource by construction-related activities would be a significant impact. Based on a reasonable presumption that archaeological resources may be present within the project site, implementation of **Mitigation 1** (archaeological resources) discussed under Alternative 1 would be required to mitigate the potential for significant impacts on archaeological resources.

Mitigation Measure

With implementation of **Mitigation 1**, *no significant residual impacts* on archaeological resources would occur from construction-related impacts on buried archaeological resources.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause a substantial adverse change in the significance of an archaeological resource with implementation of **Mitigation 1** (archaeological resources), and *no significant residual impacts* on archaeological resources would occur.

4.12.5.1.3 Factor 3: Paleontological Resources

As described for Alternative 1, fossil remains discovered in sedimentary rocks of the Franciscan Complex during construction could be scientifically important and significant. In addition, the Bay Mud underlying portions of the fill at depth is expected to have a high sensitivity because it is possible, and even likely, that those materials would contain paleontological resources. Any impacts on a unique paleontological resource or paleontological site by construction-related activities would be a significant impact. Based on a reasonable presumption that paleontological resources may be present within the project site, implementation of **Mitigation 2** (paleontological resources) discussed under Alternative 1 would be required to mitigate potential impacts to paleontological resources.

Mitigation Measure

With implementation of **Mitigation 2**, *no significant residual impacts* on paleontological resources would occur in association with Alternative 2 construction.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not directly or indirectly destroy a unique paleontological resource or paleontological site with implementation of **Mitigation 2** (paleontological resources), and *no significant residual impacts* on paleontological resources would occur.

4.12.5.2 Operational Impacts

As no ground disturbance or demolition would occur during operations, historic, archaeological, and paleontological resources would not be impacted. Because there would be *no impacts*, no mitigation is proposed. See section 4.12.5.1 for a discussion of reuse and rehabilitation of historic buildings.

Similarly, there would be no ground disturbance or demolition related to operations under Tower Variant D or the Building Preservation option, and, therefore, there would be *no impacts* on historic, archaeological, and paleontological resources.

4.12.6 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

Similar to Alternative 2, Alternative 2A (Non-Stadium Plan/Housing and R&D) would replace the football stadium, as proposed as part of Alternative 1. Unlike Alternative 2, this alternative would focus on a combination of housing and R&D space, instead of just R&D space. Construction and operational impacts related to cultural and paleontological resources would be similar to Alternative 1, as discussed below, because the type of development and associated construction activities are predominantly the same, although the exact area of ground disturbance would differ slightly. Additionally, operational activities are the same as those under Alternative 1, with the exception of the absence of the football stadium.

4.12.6.1 Construction Impacts

4.12.6.1.1 Factor 1: Historic Resources (Buildings and Structures)

As described for Alternative 1, historic resources at HPS include the National Register-eligible Hunters Point Commercial Drydock Historic District. Contributing elements to the historic district include Drydock 2, Drydock 3, and Buildings 140, 204, 205, and 207. The project site also includes Drydock 4, which is eligible for listing on the National Register as an individual building.

As with Alternative 1, Alternative 2A proposes to retain Drydock 4 and the contributing elements of the National Register-eligible Hunters Point Commercial Drydock Historic District. Drydocks 2, 3, and 4 and Buildings 140, 204, 205, and 207 would be rehabilitated using the *Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*. Therefore, *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause a substantial adverse change in the significance of a historic resource, and *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur.

4.12.6.1.2 Factor 2: Archaeological Resources

Research indicates that archaeological resources may be found on the project site and that these resources could have important research value. As described for Alternative 1, archaeological resources, (e.g., prehistoric shellmounds [CA-SFR-11, CA-SFR-12, CA-SFR-13, and CA-SFR-14], Chinese Shrimp Camps, or maritime sites) may be present within the project site area covered by existing development, and these would remain buried and undisturbed unless and until the site is redeveloped. Although the likelihood of encountering intact deposits is relatively low due to historic and modern construction activities, any substantial adverse change in the significance of an archaeological resource by construction-related activities would be a significant impact. Based on a reasonable presumption that archaeological resources may be present within the project site, implementation of **Mitigation 1** (archaeological resources) discussed under Alternative 1 would be required to mitigate the potential for significant impacts on archaeological resources.

Mitigation Measure

With implementation of **Mitigation 1**, *no significant residual impacts* on archaeological resources would occur from construction-related impacts on buried archaeological resources.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause a substantial adverse change in the significance of an archaeological resource with implementation of **Mitigation 1** (archaeological resources), and *no significant residual impacts* on archaeological resources would occur.

4.12.6.1.3 Factor 3: Paleontological Resources

As described for Alternative 1, fossil remains discovered in sedimentary rocks of the Franciscan Complex during construction could be scientifically important and significant. In addition, the Bay Mud underlying portions of the fill at depth is expected to have a high sensitivity because it is possible, and even likely, that those materials would contain paleontological resources. Any impacts on a unique paleontological resource or paleontological site by construction-related activities would be a significant impact. Based on a reasonable presumption that paleontological resources may be present within the project site, implementation of **Mitigation 2** (paleontological resources) discussed under Alternative 1 would be required to mitigate potential impacts to paleontological resources

Mitigation Measure

With implementation of **Mitigation 2**, *no significant residual impacts* on paleontological resources would occur in association with Alternative 2A construction.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not directly or indirectly destroy a unique paleontological resource or paleontological site with implementation of **Mitigation 2** (paleontological resources), and *no significant residual impacts* on paleontological resources would occur.

4.12.6.2 Operational Impacts

As no ground disturbance or demolition would occur during operations, historic, archaeological, and paleontological resources would not be impacted. Because there would be *no impacts*, no mitigation is proposed. See section 4.12.6.1 for a discussion of reuse and rehabilitation of historic buildings.

Similarly, there would be no ground disturbance or demolition related to operations under Tower Variant D or the Building Preservation option, and, therefore, there would be *no impacts* on historic, archaeological, and paleontological resources.

4.12.7 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

Alternative 3 would replace the football stadium, as proposed as part of Alternative 1, with increased housing (an additional 1,350 residential units at HPS compared to Alternative 1). All other uses at HPS would be constructed at the same locations and at the same intensities proposed for Alternative 1. Both construction and operational impacts to cultural and paleontological resources would be similar to Alternative 1, as discussed below, because the type of development and associated construction activities are predominantly the same, although the exact area of ground disturbance would differ between the two alternatives. Additionally, with the exception of the football stadium, operational activities would be similar to those proposed under Alternative 1.

4.12.7.1 Construction Impacts

4.12.7.1.1 Factor 1: Historic Resources (Buildings and Structures)

As described for Alternative 1, historic resources at HPS include the National Register-eligible Hunters Point Commercial Drydock Historic District. Contributing elements to the historic district include Drydock 2, Drydock 3, and Buildings 140, 204, 205, and 207. The project site also includes Drydock 4, which is eligible for listing on the National Register as an individual building.

As with Alternative 1, Alternative 3 proposes to retain Drydock 4 and the contributing elements of the National Register-eligible Hunters Point Commercial Drydock Historic District. Drydocks 2, 3, and 4 and Buildings 140, 204, 205, and 207 would be rehabilitated using the *Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*. Therefore, *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur. Since impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause a substantial adverse change in the significance of a historic resource, and *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur.

4.12.7.1.2 Factor 2: Archaeological Resources

Research indicates that archaeological resources may be found on the project site and that these resources could have important research value. As described for Alternative 1, archaeological resources, (e.g., prehistoric shellmounds [CA-SFR-11, CA-SFR-12, CA-SFR-13, and CA-SFR-14], Chinese Shrimp Camps, or maritime sites) may be present within the project site covered by existing development, and these would remain buried and undisturbed unless and until the site is redeveloped. Although the likelihood of encountering intact deposits is relatively low due to historic and modern construction activities, any substantial adverse change in the significance of an archaeological resource by construction-related activities would be a significant impact. Based on a reasonable presumption that archaeological resources may be present within the project site, implementation of **Mitigation 1** (archaeological resources) discussed under Alternative 1 would be required to mitigate the potential for significant impacts on archaeological resources.

Mitigation Measure

With implementation of **Mitigation 1**, *no significant residual impacts* on archaeological resources would occur from construction-related impacts on buried archaeological resources.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause a substantial adverse change in the significance of an archaeological resource with implementation of **Mitigation 1** (archaeological resources), and *no significant residual impacts* on archaeological resources would occur.

4.12.7.1.3 Factor 3: Paleontological Resources

As described for Alternative 1, fossil remains discovered in sedimentary rocks of the Franciscan Complex during construction could be scientifically important and significant. In addition, the Bay Mud underlying portions of the fill at depth is expected to have a high sensitivity because it is possible, and even likely, that those materials would contain paleontological resources. Any impacts on a unique paleontological resource or paleontological site by construction-related activities would be a significant impact. Based on a reasonable presumption that paleontological resources may be present within the project site, implementation of **Mitigation 2** (paleontological resources) discussed under Alternative 1 would be required to mitigate potential impacts to paleontological resources.

Mitigation Measure

With implementation of **Mitigation 2**, *no significant residual impacts* on paleontological resources would occur in association with Alternative 3 construction.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not directly or indirectly destroy a unique paleontological resource or paleontological site with implementation of **Mitigation 2** (paleontological resources), and *no significant residual impacts* on paleontological resources would occur.

4.12.7.2 Operational Impacts

As no ground disturbance or demolition would occur during operations, historic, archaeological, and paleontological resources would not be impacted. Because there would be *no impacts*, no mitigation is proposed. See Section 4.12.7.1 for a discussion of reuse and rehabilitation of historic buildings.

Similarly, there would be no ground disturbance or demolition related to operations under Tower Variant D or the Building Preservation option, and, therefore, there would be *no impacts* on historic, archaeological, and paleontological resources.

4.12.8 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

Alternative 4 was selected to provide a reduced development alternative to Alternative 1. This alternative would reduce the area subject to development and therefore reduce potentially significant impacts associated with construction. In addition, the offsite Yosemite Slough bridge would not be built; therefore, construction related impacts would be reduced.

4.12.8.1 Construction Impacts

4.12.8.1.1 Factor 1: Historic Resources (Buildings and Structures)

As described for Alternative 1, historic resources at HPS include the National Register-eligible Hunters Point Commercial Drydock Historic District. Contributing elements to the historic district include Drydock 2, Drydock 3, and Buildings 140, 204, 205, and 207. The project site also includes Drydock 4, which is eligible for listing on the National Register as an individual building.

As with Alternative 1, Alternative 4 proposes to retain Drydock 4 and the contributing elements of the National Register-eligible Hunters Point Commercial Drydock Historic District. Drydocks 2, 3, and 4 and Buildings 140, 204, 205, and 207 would be rehabilitated using the *Secretary of the Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*. Therefore, *no significant* impacts from rehabilitation and reuse of historic buildings and structures would occur. Since impacts would not be significant, no mitigation is proposed.

4.12.8.1.2 Factor 2: Archaeological Resources

Research indicates that archaeological resources may be found on the project site and that these resources could have important research value. As described for Alternative 1, archaeological resources, (e.g., prehistoric shellmounds [CA-SFR-11, CA-SFR-12, CA-SFR-13, and CA-SFR-14], Chinese Shrimp Camps, or maritime sites) may be present within the project site covered by existing development, and these would remain buried and undisturbed unless and until the site is redeveloped. Although the likelihood of encountering intact deposits is relatively low due to historic and modern construction activities, any substantial adverse change in the significance of an archaeological resource by construction-related activities would be a significant impact. Based on a reasonable presumption that archaeological resources may be present within the project site, implementation of **Mitigation 1** (archaeological resources) discussed under Alternative 1 would be required to mitigate the potential for significant impacts on archaeological resources.

Mitigation Measure

With implementation of **Mitigation 1**, *no significant residual impacts* on archaeological resources would occur from construction-related impacts on buried archaeological resources.

4.12.8.1.3 Factor 3: Paleontological Resources

As described for Alternative 1, fossil remains discovered in sedimentary rocks of the Franciscan Complex during construction could be scientifically important and significant. In addition, the Bay Mud underlying portions of the fill at depth is expected to have a high sensitivity because it is possible, and even likely, that those materials would contain paleontological resources. Any impacts on a unique paleontological resource or paleontological site by construction-related activities would be a significant impact. Based on a reasonable presumption that paleontological resources may be present within the project site, implementation of **Mitigation 2** (paleontological resources) discussed under Alternative 1 would be required to mitigate potential impacts to paleontological resources

Mitigation Measure

With implementation of **Mitigation 2**, *no significant residual impacts* on paleontological resources would occur in association with Alternative 4 construction.

4.12.8.2 Operational Impacts

As no ground disturbance or demolition would occur during operations, historic, archaeological, and paleontological resources would not be impacted. Because there would be *no impacts*, no mitigation is proposed. See Section 4.12.8.1 for a discussion of reuse and rehabilitation of historic buildings.

4.12.9 No Action Alternative

Under the No Action Alternative, the portion of HPS proposed for development under the other alternatives would not be disposed of and would remain a closed federal property under caretaker status. Thus, these parcels would not be reused or redeveloped. Additionally, the Hunters Point Commercial Drydock Historic District and Drydock 4 would remain under federal ownership and federal protection.

As no ground disturbance or demolition would occur, there would be *no impacts* to historic, archaeological, and paleontological resources.

4.12.10 Mitigation

Table 4.12.10-1 describes the mitigation measures proposed to reduce potentially significant impacts associated with the proposed action and alternatives and the significance of the impact after mitigation.

Table 4.12.10-1. Mitigations for Potential Significant Impacts the Proposed Action and Alternatives

Significance Factor	***Mitigation Measures***						
	Alternative 1 (Stadium Plan Alternative)	*Alternative 1A (Stadium Plan/No-Bridge Alternative)*	*Alternative 2 (Non-Stadium Plan/Additional R&D Alternative)*	*Alternative 2A (Non-Stadium Plan/Housing and R&D Alternative)*	*Alternative 3 (Non-Stadium Plan/Additional Housing Alternative)*	*Alternative 4 (Non-Stadium Plan/Reduced Development Alternative)*	*No Action Alternative*
Factor 2: Construction-Related Impact on Archaeological Resources	***Mitigation 1:*** The future developer or owner of the property would be responsible for implementing and funding an Archaeological Testing, Monitoring, and Mitigation Program. This program would be implemented prior to the initiation of construction activities. Additional measures would be implemented in consultation with the San Francisco Historic Preservation Commission and the San Francisco Planning Department and in coordination with the city's Environmental Review Officer. ***Residual Impact After Mitigation:*** Not significant.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts would be expected and no mitigation is proposed.
Factor 3: Construction-Related Impact on Paleontological Resources	***Mitigation 2:*** The future developer or owner of the property would be responsible for implementing and funding a Paleontological Resources Monitoring and Mitigation Program. This program would be implemented concurrent with construction activities and in coordination with the city's Environmental Review Officer. ***Residual Impact After Mitigation:*** Not significant.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts would be expected and no mitigation is proposed.

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4.13 Biological Resources

4.13.1 Methodology

This section considers the potential direct, indirect, and cumulative effects of construction and operations under each alternative described in Chapter 2, including onsite and offsite impacts. Potential impacts are analyzed using information identified in Chapter 2, the environmental setting for biological resources (Section 3.13, Biological Resources), results of literature and field surveys, the potential for the project site to support special-status species, and by comparing this information to the following significance factors.

4.13.1.1 Significance Factors

Factors considered in determining whether an alternative would have significant impacts on biological resources include the extent or degree to which the implementation of an alternative would:

Factor 1 Have a substantial adverse effect, either directly or through habitat modifications, on federally listed threatened or endangered species or a candidate for federal listing;

Factor 2 Have a substantial adverse effect on any sensitive natural community identified in federal plans, policies, and regulations;

Factor 3 Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marshes, vernal pools, or coastal areas) through direct removal, filling, hydrological interruption, or other means; and/or

Factor 4 Interfere substantially with the movement of native resident or migratory fish or wildlife species populations or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

In addition to factors listed above, impacts to special-status species would be significant (in the absence of mitigation) if the project adversely affected: 1) a major population or subpopulation of a special status species resulting in the regional decline of this species; 2) a relatively large number of individuals within a population considered rare or declining; 3) the meta-population of a species (i.e., if one of only a few known populations occurs in the impact zone, or if the species has extremely narrow habitat requirements); or 4) a habitat type or vegetation community in regional decline or that is regionally endemic.

Impacts to sensitive or rare species would not be significant, even without mitigation, if project activities are not expected to substantially affect species or populations because: 1) a relatively small number of non-listed individuals would be impacted; 2) the number of individuals of a non-listed species would represent a very small fraction of regional populations; 3) recovery and conservation efforts are documented to adequately conserve the species or habitat, and impacts would not affect the recovery or conservation of this species or habitat; or 4) the species or habitat is locally common, fairly abundant in the region, or non-native to the region.

4.13.1.2 Analytic Method

The evaluation of impacts to biological resources from the proposed action is complicated by the need to consider the phasing of in-process and future remediation activities that would modify existing site conditions before some project components are constructed. As a result, “baseline conditions” plus other data collected or research conducted within the project site area (since 2003) could be different from conditions that would be present when project components are constructed. To adequately and conservatively characterize the impacts of the project to biological resources, impacts to potentially affected resources (such as species and wetlands) are analyzed assuming construction of project improvements occurs prior to completion of DoN remediation activities.

4.13.2 Alternative 1: Stadium Plan Alternative

4.13.2.1 Construction Impacts

4.13.2.1.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED OR ENDANGERED PLANTS AND WILDLIFE

HPS is dominated by industrial and developed areas. The southern shoreline of HPS and the proposed Yosemite Slough bridge area include a mixture of salt marsh, seasonal brackish marsh, freshwater seasonal wetland, and non-native annual grassland. Federally listed threatened and endangered plants were not observed during any of the focused botanical or rare plant surveys conducted in 2007 or 2008. Factors limiting rare plant occurrences within this area include: a lack of natural fire regimes (largely since Euro-American settlement), early maritime development, and construction of a World War II-era Shipyard, as well as post-war development. Those actions have resulted in urbanization of almost all of the HPS project area. Because no federally listed threatened and endangered plants have been observed and the site generally does not support the preferred or required soils (e.g., serpentine) needed to support these species, sensitive plant species are considered absent from HPS and Yosemite Slough bridge areas. Therefore, *no impacts* to sensitive plants would occur. Because impacts would not be significant, no mitigation is proposed.

No threatened or endangered terrestrial wildlife species are known to occur or are expected to use the project area as important habitat; therefore *no significant impacts* would occur. All HPS project alternatives would include the restoration of native habitat, which would likely benefit many species.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause habitat modification, and impacts to biological resources would *not be significant*.

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

As addressed in Section 3.13, numerous common plant and wildlife species occupy the study area, including a number of species of invertebrates, reptiles and amphibians, birds, and mammals. Common plant communities consist primarily of non-native annual grassland with some landscaped areas/ornamental plants. Upon project implementation, 44.19 ac (17.88 ha) of non-native grasslands would be eliminated and eventually replaced by native vegetation, grass fields, and public parks. Common species and habitats would be affected through the removal of marginal habitat (non-native grasslands), removal of trees, and shoreline improvements for the proposed action. With ground disturbance, there is the possibility of harming nesting birds or their active nests, or of frightening them from their nests. The removal of buildings has the potential of harming or frightening raptors or bats that nest/roost in buildings. Species remaining in the area would be subjected to increases in noise, dust, and lighting associated with construction for numerous years as the project site is built up. As a result, some habitats would be reduced in extent during construction and some common species would temporarily decline in local abundance. However, potential impacts from the proposed action to common species and habitats would not be substantial due to the current low abundance of wildlife on the site. This is due to the extent of developed/urban land uses on the site, the long history of site disturbance, the intensive nature of such disturbance in some areas (e.g., where remediation activities on HPS are occurring or have recently occurred), and the site's isolation from more extensive areas of natural habitat by the bay and by urban development in the project vicinity. Further, these species/habitats are abundant throughout many areas of the San Francisco Bay region, and the project site supports extremely small percentages of the populations. Species that are present in higher numbers on the site consist primarily of those that are well adapted to urban or heavily disturbed areas. Consequently, any impacts of the project on common species and habitats would have a negligible effect on regional populations. Therefore, impacts would *not be significant*. However, implementation of **Mitigation 1** would further reduce the potential for impacts to ground-nesting birds and to bats and birds that nest in buildings.

Mitigation Measure

Mitigation 1. Pre-construction surveys to reduce impacts to birds and bats. Harming birds or their active nests would violate the Migratory Bird Treaty Act (MBTA; see Section 3.13, Biological Resources). If building removal would occur from February through August, pre-construction clearance surveys would be conducted by a qualified biologist experienced with local bird and bat species. All grassland areas, the Re-Gunning Crane, and any buildings to be removed would be checked prior to project activities for active nests and bats. If trees would be removed, they would also be checked for active nests. If active bird nests are found, vegetation/building removal within a buffer of 250 ft (76.20 m) for raptors and 100 ft (30.48 m) for non-raptors around active nests would be delayed until young have fledged, which would be determined by the qualified biologist. The size of the buffer area may be reduced if a qualified biologist familiar with the species' nesting biology, as approved by CDFG and City and County of San Francisco, determines it would be unlikely to have adverse effects on the particular species. Alternatively, certain activities may occur within the previously mentioned buffers, with CDFG concurrence, if a qualified biologist monitors the activity of nesting birds for signs of agitation while those activities are being performed. If the birds show signs of agitation suggesting that they could abandon the nest, activities would cease within the buffer area. If bat roosts are found, the necessary buffer would be determined by the qualified biologist. Implementation of this mitigation, as identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]), would be the responsibility of the future developer or owner of the property. The mitigation would not be implemented more than 15 days prior to construction activities that occur between February 1 and August 31. The CDFG would enforce the mitigation, and monitoring for compliance would be the responsibility of the City and County of San Francisco. Nesting bird survey findings would be submitted to the City and County of San Francisco with consultation with the CDFG, as appropriate.

For ground-nesting bird species and birds that may be nesting or bats that may be roosting in and on abandoned buildings at the project site, there is the potential for construction-related impacts. Bird species such as burrowing owls, killdeer, and horned larks that can tolerate some disturbance may continue to nest in the ruderal grasslands on the project site. If vegetation clearance/grading activities occur, especially in spring, active nests, eggs, or nestlings may be injured or killed. If buildings are torn down, barn owls or bats may also be harmed. As noted in Section 3.13, a pair of American peregrine falcons has been nesting on the Re-Gunning Crane in recent years. Project-related noise and other disturbance may cause these birds to abandon their nest. Implementation of **Mitigation 1** would further reduce the potential adverse effects of construction activities related to ground and building clearance to birds and bats, and residual impacts would *not be significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause additional habitat modification, and impacts to biological resources would *not be significant*.

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

Project activities would permanently impact 0.17 ac (0.07 ha) of isolated, seasonal freshwater wetlands located inland at HPS. Permanent impacts are those that would remove wetlands and not replace them in the same location. Temporary impacts would be short term because, after construction, any areas disturbed would be restored to the previous condition.

Direct removal of, placement of fill into, or hydrological interruption of federally protected wetlands that would result in a net loss of these areas would be considered an adverse effect. In addition, any removal of an established mitigation site would be considered an adverse effect. However, implementation of **Mitigation 2** would reduce the potential for impacts to seasonal freshwater wetlands.

Mitigation Measure

Mitigation 2. Wetlands mitigation. Permanent impacts to wetlands would be mitigated based on a minimum 1:1 ratio (at least 1 acre of mitigation for every 1 acre of wetlands permanently filled) with final agency determinations occurring at the permitting stage. The exact mitigation ratio would be established during the permitting process, and would depend on a number of factors, including the type and value of the wetlands permanently affected by the project. For wetland areas to be restored or created as mitigation for temporary or permanent impacts, the future developer or owner of the property would prepare and implement a Wetland and Jurisdictional Waters Mitigation Monitoring Plan (Mitigation Monitoring Plan). Mitigation would be achieved through a combination of onsite restoration or creation of wetlands or aquatic habitats (including removal of onsite fill or structures such as piers, resulting in a gain of wetland or aquatic habitats); offsite restoration/creation; and/or mitigation credits associated with mitigation banks within the Bay Area. The Mitigation Monitoring Plan would be submitted to the regulatory agencies along with permit application materials for approval. For example, the city is negotiating with State Parks to conduct restoration/habitat creation that might also cover mitigation for these types of impacts. At least five years of mitigation monitoring would be conducted, and quarterly reports of compliance activity would be submitted to the City and County of San Francisco and annual monitoring reports would be submitted to the City and County of San Francisco and the resource and regulatory agencies (CDFG, BCDC, USACE, SFRWQCB). Implementation of this mitigation, as identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]), would be the responsibility of the future developer or owner of the property. The City and County of San Francisco and regulatory agencies would enforce the mitigation, and monitoring for compliance would be the responsibility of the City and County of San Francisco in consultation with the other regulatory agencies, as necessary. The mitigation would be implemented prior to the initiation of construction activities. The future developer or owner would provide written evidence to the City and County of San Francisco for funding of offsite improvements or purchase of mitigation bank credits. With implementation of **Mitigation 2,** residual impacts to biological resources associated with wetlands would *not be significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause additional habitat modification, and impacts to biological resources would not be significant.

4.13.2.1.2 Marine and Aquatic Resources

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Noise levels generated by pile driving during construction activities have the potential to disturb, injure, or kill fish species, including sensitive species such as green sturgeon, steelhead, Pacific herring, and longfin smelt. Pressure waves from pile driving can affect fish in the water column through behavioral effects such as avoidance to physiological effects such as stress, temporary loss of hearing, rupture of swim bladders, formation of bubbles in the circulatory system, and corresponding rupturing of blood vessels, traumatic brain injuries, and death in extreme cases. Species with swim bladders are the most susceptible although ear structures of any species can be damaged. Sound levels of 180 dB generating 1 micropascal (μPa^2-s) have been documented to injure or kill fish (Woodbury and Stadler 2009; Popper, *et al*. 2006). Caltrans (2004) reported no hearing damage to steelhead and shiner surfperch when exposed to multiple pile driving strikes that ranged from 158 to 182 dB (re 1 μPa^2-s) at distances of 75 to 1,030 ft (23-314 m) from the pile. This study showed no statistically significant mortality (i.e., pile driving different from control groups) for sound exposure levels as high as 181 dB (re 1 μPa^2-s) for surfperch and 182 dB (re 1 μPa^2-s) for steelhead.

Marina construction would require pile driving of approximately 675 piles, which could result in noise impacts to some fishes in the area that may not be able to move away from this source, particularly small species that live on or in the bottom such as gobies. Other, more mobile fish species would likely avoid impacts by moving out of the area during pile driving activities. A number of best management practices (BMPs) would be implemented during construction, including use of a vibratory hammer (as feasible based on final construction plans), restricting pile driving of steel piles to a specific in-water work window recommended by NMFS, and use of an air (bubble) curtain to moderate sound wave propagation.

Besides the marina, approximately 20 columns supported by steel piles would be used to construct the Yosemite Slough bridge. Current bridge designs would require installation of coffer dams (temporary structures typically constructed with sheet piles that separate a worksite from the water and allow it to be dewatered). The bridge piles would be driven behind dewatered coffer dams which would result in the piles being out of water and, therefore, would avoid generation of in-water sound pressure waves that could injure fish species. Ground pressure waves produced by pile driving within a dewatered coffer dam are not expected to injure fish. Use of BMPs such as construction closure periods during seasonal migration of sensitive species and use of specific noise-reducing equipment, including piles that help minimize sound impacts, would avoid or minimize potential impacts to fishes and would further reduce the potential for impacts to other aquatic resources.

Construction activities during Alternative 1 would disturb designated critical habitat for green sturgeon and Central California Coast steelhead within the bay, and there is some possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, could be impacted as well. However, Chinook salmon are likely found in low abundance and their main migratory corridor is outside the project vicinity (SFRA 2010). Construction of the proposed marina (including breakwaters) would result in the loss of habitat for these special-status fish species. Construction of shoreline treatments and placement of fill in other locations around the perimeter of HPS would also affect a small amount of shallow, relatively low-quality foraging habitat for green sturgeon and steelhead.

Some sensitive fish species such as green sturgeon and Central California Coast steelhead may forage in the vicinity of the proposed Yosemite Slough bridge during high tides, although their occurrence in the project site is expected to be low. Construction of the bridge could result in temporary increases in turbidity and there would be some habitat modification associated with the permanent loss of 0.11 ac (0.04 ha) of mudflat and aquatic habitat within the bridge footprint. However, it is anticipated that the remaining habitat for these species would return to its native state in a short period of time (days to weeks) following construction activities. Even though the project site is located in designated critical habitat (San Francisco Bay) and could be visited infrequently by migrating salmon, steelhead, and green sturgeon, the project site is in an area considered to be highly urbanized and is unlikely to support appropriate critical habitat (e.g., substrate type) for any federally or state-listed threatened or endangered fish species. Furthermore, the proposed action location does not support spawning habitat for salmonids. The project would result in a net increase in open waters of the bay of approximately 8.5 ac (3.4 ha) (see Factor 2: Sensitive Communities below).

To protect aquatic habitat and listed fish species during construction and operation of Alternative 1's in-water components (i.e., marina, Yosemite Slough bridge, shoreline improvements), avoidance measures, mitigation, and monitoring, as identified in this SEIS, the 2010 Reuse Plan, 2000 FEIR, and City of San Francisco development regulations and policies would be implemented by the City and County of San Francisco and/or the future developer or owner of the property. For example, the Mitigation Monitoring and Reporting Program (MMRP), adopted and incorporated by the SFRA in Resolution No. 59-2010, *Adopting Environmental Findings Pursuant to the California Environmental Quality Act, including the Adoption of a Mitigation Monitoring and Reporting Program and a Statement of Overriding Considerations, for the Candlestick Point – Hunters Point Shipyard Phase II Development Plan Project; Bayview Hunters Point and Hunters Point Shipyard Redevelopment Project Areas*, 3 June 2010, identifies environmental issues for which monitoring is required, the required mitigation measures, the time frame for monitoring, and the responsible implementing and monitoring agencies. The following MMRP measures, as identified in Resolution No. 59-2010, would be implemented during reuse construction and operational activities (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]):

- All in-water construction will occur between June 1 and November 30.
- A Storm Water Pollution Prevention Plan (SWPPP) will be developed and will include an Erosion and Sediment Control Plan. Erosion control measures will be implemented, including the application of straw mulch, seeding with fast growing grasses, and construction of berms, silt fences, hay bale dikes, storm water detention basins, and other energy dissipaters. All exposed slopes and banks will be stabilized immediately following completion of construction activities.
- BMPs, including the use of berms, silt fences and detention basins, will be implemented to ensure contaminants are prevented from entering the San Francisco Bay.
- In tidal areas, work will occur only in dewatered sites and during periods of slack tide.
- A Seafloor Debris Minimization and Removal Plan will be prepared and implemented.
- The proposed bridge and marina structures will be designed and engineered such that the amount and size of piles, and the duration of installation are minimized.
- Piles will be driven with a vibratory device when feasible. If vibratory hammer use is not feasible, then steel piles driven with an impact hammer and will be used together with an air curtain, or the area around the piles being driven will be dewatered using a cofferdam.
- During use of an impact hammer for pile driving, in-water sound levels will be monitored to ensure that the air curtain is functioning properly and project-generated sound waves do not exceed the threshold of 180-decibels generating 1 micropascal.
- Clean Marinas California Program will be implemented and BMPs listed in the National Management Measures to Control Nonpoint Source Pollution from Marinas and Recreational Boating will be employed. The BMPs will address petroleum containment, topside boat maintenance and cleaning, underwater boat hull cleaning, marina operations, marina debris, boat sewage discharge, solid waste, liquid waste, fish waste, hazardous materials, and stormwater runoff.

Development of the in-water components (e.g., Yosemite Slough bridge, shoreline improvements, and construction of the marina), associated with Alternative 1, by the future developer or landowner would potentially impact designated critical habitat. However, based on the low probability of occurrence of sensitive fish species in the project site area, the small area of habitat loss compared to the entire bay, implementation of monitoring and avoidance measures (e.g., BMPs, seasonal restrictions, etc.), and the approximate 8.5 ac of increase in fish habitat, impacts would *not be significant*.

The DoN has determined that the effects of the proposed action may effect, but is not likely to adversely affect species or adversely modify critical habitat. The DoN coordinated with, obtained technical assistance, and consulted with the NMFS pursuant to Section 7(a)(2) of the ESA, as amended, on this determination. The DoN received concurrence from NMFS on the determination that the "effects of the DoN's proposed transfer of surplus property at HPS, together with the effects of the Redevelopment Agency's planned reuse, an activity interrelated and/or interdependent with the DoN's action, are not likely to adversely affect threatened CCC (Central California Coast) steelhead, threatened southern DPS (district population segment) and designated critical habitat" (NMFS 2012). Appendix D includes copies of the DoN and NMFS consultation letters.

As a result of the coordination between the NMFS and the DoN (see above), NMFS recommends that the future developer or owner of the property implement the following BMPs pertaining to: 1) construction activities associated with Yosemite Slough bridge, 2) shoreline improvements, and 3) construction of the marina (personal communication, Will 2011). The NMFS recommended BMPs are as follows:

- Avoid in-water construction between 1 June and 30 November to avoid migrating anadromous salmonids.
- Conduct in-water construction during low tide to minimize the number of fish in the work area.
- Implement measures to avoid and minimize sediment and contaminant input to the aquatic system.
- Keep construction and maintenance material out of the waterway.
- Use a silt curtain to minimize dispersion of re-suspended sediments.
- Dispose of all dredged materials to upland locations.
- If the marina project utilizes treated wood piles, use the 'NMFS SWR Treated Wood Guidelines' (http://swr.nmfs.noaa.gov/pdf/Treated%20Wood%20Guidelines-FINALClean_2010.pdf) for determining potential impacts and mitigations. The BMPs for treated wood pilings include, but are not limited to, coating both in-water and above-water portions of treated wood with an impact-resistant, biologically inert material (e.g., epoxy) to encapsulate wood and prevent leaching of contaminants and maintaining that coating in perpetuity.
- If steel/concrete piles are used:
  - Use a vibratory hammer.
  - For impact hammers, use a bubble curtain during pile driving activities to moderate sound wave propagation.
  - Monitor sound via hydrophones during pile driving, if sound levels exceed a specified threshold cease pile driving and contact NMFS.
  - Specify how steel pilings will be protected from corrosion. If a sacrificial anode system (typically using zinc or aluminum) is planned, then provide estimates of metal contamination to area sediments in the analysis for permitting.
- Over-water structures should be designed to incorporate the following build "as" or "with" elements:
  - Built with north-south orientation;
  - At a minimum of 5 ft over mean higher high water;
  - Individual surfaces not wider than 4 ft;
  - Turnarounds not exceeding 60ft^2;
  - No covered structures such as dry docks or boat houses;
  - Terminal ends not exceeding 100 ft^2;
  - Pilings spaced at a minimum of 10 ft on center; and
  - Gaps between deck boards a minimum of ½ in apart and/or incorporating light transmitting material (i.e., grated decking) into the marina design.
- As part of marina operations, boats should use nontoxic and legal hull paints to reduce the possibility of contamination when performing hull cleaning, as copper based bottom paints may be toxic to marine organisms.

It is anticipated that federal permit authorization from the USACE would be required for the Yosemite Slough bridge, shoreline improvements, and construction of the marina. Additional reuse and development actions may also be subject to USACE permitting under the Clean Water Act (e.g., Section 404) or Rivers and Harbors Act of 1899 (e.g., Section 10). At such time that applications for federal permits are submitted and specific project details become available, USACE and NMFS would conduct Section 7 consultations pursuant to the ESA, and the EFH provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as appropriate.

The future developer or owner of the property would prepare a Section 404(b)(1) analysis to demonstrate that the proposed project represents the least environmentally damaging practicable alternative (LEDPA). In addition, the future developer or owner of the property would be responsible for adhering to all applicable local, state, and federal environmental regulations and laws and for acquiring any applicable local, state, and federal permits and approvals required for development of the property, including all in-water development components (e.g., marina, shoreline improvements, etc.).

MARINE AND OTHER AQUATIC BIRDS

One federally listed avian species, the California least tern, and a recently delisted species, the California brown pelican, were determined to have a "low" or higher potential to occur at the project site and vicinity. A California least tern breeding colony is located at Alameda Point, approximately 4 mi (6.4 km) west of the project site (Euing 2009). This species has not been observed in the study area, and although California least terns could occasionally forage near the project site no suitable nesting habitat is present. Additionally, the recently (December 2009) delisted California brown pelican roosts in the greatest numbers in San Francisco Bay along the Alameda Breakwater, approximately 2.5 mi (4 km) from the project site (Golden Gate Audubon Society 2009). Pelicans have been observed roosting in the project site, but no known important roosting or nesting areas are present. Even though the project site has been used as an industrial site for many decades and is undergoing remediation activities, additional noise and human presence associated with ground clearance and construction activities may disturb pelicans from roosts that are typically used on site. However, this would be expected to be a temporary disturbance. Restoration features under Alternative 1 would not likely create breeding habitat for pelicans or terns because they do not currently nest in the area and have specific nesting habitat requirements. However, once access to three piers by humans and mammalian predators is prevented, some bird species may choose to use these platforms for nesting. Roosting habitat would continue to be present for California brown pelicans, and California least tern may utilize the coastal areas for foraging. Therefore, impacts would *not be significant.* Because impacts would not be significant, no mitigation is proposed.

MARINE MAMMALS

Similar to impacts described above for fish, construction activities could temporarily impact marine mammals by creating noise, primarily from pile driving. Installation of piles with an impact hammer has the potential to generate substantial sound pressure waves. Installation of pilings that resulted in generation of sound pressure waves could result in impacts to marine mammals, although most likely limited to temporary disruption of behavior patterns. However, based on pile driving data presented in Illingworth & Rodkin (2007) for five projects in the San Francisco Bay Area, the impulse pressures should be below the guideline of 190 dB in reference to (re) 1 μPa for pinnipeds (Caltrans 2007). Further, since few marine mammals occur in the project site area, and these individuals would be able to leave during construction periods and return when construction is concluded, impacts would *not be significant.* Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause habitat modification, and impacts to biological resources would *not be significant*.

Factor 2: Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS

Within HPS, a total of 1.99 ac (0.81 ha) of eelgrass occurs at two locations: a small patch on the north shore of the South Basin directly across from Candlestick Point and an eelgrass bed on the north shore east of the northern end of Earl St. These areas are mapped as being below mean sea level and, therefore, are spatially separated from the areas where shoreline treatments would occur. No mapped eelgrass beds are documented where the marina improvements would occur or where the Yosemite Slough bridge would be constructed. Therefore, impacts to eelgrass would *not be significant.* Because impacts to eelgrass would not be significant, no mitigation is proposed.

Alternative 1 includes the removal of some shoreline structures (i.e., piers and/or bulkheads) and fill material that are currently present in jurisdictional areas. For example, portions of the Re-Gunning Pier and edges of bulkheads along much of the eastern part of HPS would be removed to create new open-water habitat. These areas are considered permanently impacted for the purposes of this assessment because some fill would be placed along the new shoreline of these bulkheads for stabilization and restoration purposes. The most substantial loss of EFH would result from the placement of rock buttress fill necessary to protect the integrity of existing bulkheads. Although aquatic habitat would remain above the buttresses, this rock would occupy existing fish habitat. However, removal of structures and fill would restore approximately 8.5 ac (3.4 ha) of aquatic habitat, offsetting the loss of EFH that would result from placement of fill for buttresses.

Shoreline treatments represent additional elements of HPS construction that could affect EFH. Repairs to the seawall and other shoreline treatments would result in modifications to EFH, both due to modification of substrate and mobilization of sediments during construction. However, because these impacts primarily would be temporary and localized and often replace an existing failing structure with a similar structure, these repairs would not result in a substantial modification of the function of existing EFH. Also, shoreline improvements along the southern edges of HPS would reduce coastal erosion and associated turbidity, resulting in a long-term benefit to water quality and EFH. Collectively, these repairs and improvements for the project are not considered to represent a substantial reduction in designated EFH.

Although impacts to the populations of common aquatic species would be less than significant, the HPS development would be considered to have an adverse effect on EFH overall because the function of that habitat would be altered by the project, potentially having longer-term consequences on aquatic habitat for both common and special-status aquatic species. However, EFH species would be able to move away in response to temporary construction activities and subsequently return after these activities have concluded. Any loss of EFH that would result from construction activities at HPS would be mitigated via wetland mitigation (**Mitigation 2** above) and temporary impacts would be minimized with **Mitigation 3.** Mitigation measures would be verified as part of the permitting process. For San Francisco Bay, decisions regarding the type and location of compensatory mitigation would be addressed by the agencies on a case-by-case basis. A broad scientific approach to compensatory mitigation would involve the location and design of mitigation sites based on a bay-wide assessment to compensate for the adverse impacts of the proposed project while also contributing to the long-term ecological functioning of the entire bay system.

Mitigation Measure

Mitigation 3. Seasonal restrictions on in-water work. In-water work would be avoided when EFH species such as juvenile salmonids are moving through the estuary on the way to the ocean, coastal pelagic species may be in the vicinity, or when groundfish and prey species could be directly impacted. Since some EFH species may occur infrequently in the project area, the dredge window for this area of the San Francisco Bay is June 1 through November 30. All in-water construction would occur during this window. If completion of in-water work within this period is not feasible due to scheduling issues, new timing guidelines would be established and submitted to the proper agencies (i.e., NMFS and CDFG) for review and approval. Implementation of this mitigation, as identified in the FEIR (Resolution No. 59-2010, Mitigation Monitoring and Reporting Program [SFRA 2010]), would be the responsibility of the future developer or owner of the property. The CDFG and NMFS would enforce the mitigation, and monitoring for compliance would be the responsibility of the City and County of San Francisco in consultation with the regulatory agencies, as necessary. This mitigation would be implemented during any construction occurring between June 1 and November 30. The construction contractor would be required to submit a quarterly report of compliance activity to the City and County of San Francisco.

Mitigation 3 would reduce the effects of construction-related activities to EFH by establishing a construction window that would minimize impacts to fish by avoiding migration and breeding periods.

With implementation of **Mitigation 3** the overall function of EFH habitat would not be altered by Alternative 1 (including construction of Yosemite Slough bridge) and residual impacts to EFH species and habitats would *not be significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause additional habitat modification, and impacts to biological resources would *not be significant*.

INVERTEBRATES AND FISHES

Although no formal invertebrate and fish surveys have been performed in the project vicinity, many areas of open water in the bay support an array of common estuarine/marine species from encrusting tunicates, sponges, and algae to bottom-dwelling fish, such as halibut, flounder, and sole, to more open water fish like anchovies, herring, and sardines. Less than significant temporary and short-term impacts would occur during construction (see Factor 1 above). Under a worst-case scenario, Alternative 1 would permanently affect the habitats and number of acres noted above for Factor 3: Wetlands, Habitats. However, impacts would be short term because disturbed areas would be restored to their previous condition in a short amount of time (weeks to months) after construction is completed.

Alternative 1 would remove small sections of Piers 1, 2, and 3 to separate them from the shore and prevent public access. Those piers include pilings that are considered suitable substrate for various invertebrates, including mussels and oysters, to use for attachment. The removal of small sections of the piers would result in the loss of a very small amount of hard substrate. In addition, this alternative would repair portions of existing seawall structures, place buttress fill (below the water surface) for structural stability of seawall structures, and modify several piers and drydocks along the shoreline. These shoreline improvements would temporarily affect substrate used by oysters and mussels, but would not substantially reduce populations or available habitat due to the relatively small areas that would be involved. The creation of a new marina for this alternative would require installation of two breakwater sections (ranging between 300 and 650 ft in length (91-198 m) and 5,700 ft (1,737 m) of floating docks that would provide suitable settlement habitat for organisms such as mussels and oysters, resulting in a series of offsetting impacts (temporary impacts associated with the removal of hard substrate for settling, followed by the replacement of these areas with new hard substrate). Construction of the Yosemite Slough bridge may also result in the removal of or modifications to a small amount of riprap where the bridge abutments would be located and which may be used by native oysters. However, riprap would also be placed near the abutments once they are constructed, thus replacing any hard substrate used by sessile invertebrates that is temporarily impacted or removed. Further, the bridge piers would provide additional hard substrate that could potentially serve as substrate for oyster and mussel colonization. Therefore, although temporary impacts to hard substrate used by invertebrates would occur during construction, effects on these organisms would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause habitat modification, and impacts to biological resources would *not be significant*.

Factor 3: Wetlands

HABITATS

Construction activities for Alternative 1, including construction of the Yosemite Slough bridge, would permanently alter existing shoreline wetlands and other habitats, including 0.09 ac (0.04 ha) of tidal salt marsh, 0.15 ac (0.06 ha) of non-tidal salt marsh, and 20.44 ac (8.27 ha) of other Waters of the U.S., as defined by Section 404 of the CWA (specifically, bay habitat). Of that total, construction of Yosemite Slough bridge would impact 0.01 ac (0.004 ha) of vegetated wetlands and 0.13 ac (0.05 ha) of other waters of the U.S. Construction activities would also cause temporary and localized impacts to less than 0.01 ac (0.004 ha) of tidal salt marsh and to 1.37 ac (0.55 ha) of bay. Of that total, the temporary impacts to waters associated with bridge construction would total 0.99 ac (0.40 ha). Temporary impacts are short term because, after construction, any areas disturbed would be restored to the previous condition. Permanent impacts are those that would remove wetlands or jurisdictional waters (bay habitat) and not replace them in the same location, and are considered an adverse effect. However, implementation of **Mitigation 2** would replace lost wetlands so that wetland impacts would *not be significant*.

4.13.2.2 Operational Impacts

4.13.2.2.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

As stated above, federally listed threatened and endangered plants were not observed during any of the focused botanical or rare plant surveys conducted in the study area. Because the site does not currently contain the preferred or required soils (e.g., serpentine) needed to support the listed plant species known to occur in the vicinity, none are expected to occur in the study area. As part of the project design for Alternative 1, over 80 ac (32 ha) of eco-gardens, passive lawns, native grasslands, windbreak groves, and landforms offering views of the bay and shoreline habitats (Grasslands Ecology Park at Parcels E and E-2) would be created. While no federally listed species would necessarily be present following restoration, the conditions for native and sensitive species would become more favorable. Notwithstanding, due to limiting factors such as a lack of seedbanks and dispersal distances in an urbanized environment, no federally listed plant species is expected to become established in the proposed project site area following restoration.

Following establishment, these "natural" habitats could attract other federally listed threatened or endangered animal species, particularly birds known to inhabit the vicinity and which have the ability to more easily cross the urban or water surroundings than non-flying wildlife. The approximate 80 acres of eco-gardens, passive lawns, and native grasslands would be a benefit to these species, providing potential foraging and breeding habitat. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1, would not cause habitat modification, and impacts to these biological resources would *not be significant*.

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

With the creation of additional residential, commercial, and recreational areas, increased human activity expected at Hunters Point following completion of construction would likely affect wildlife, including invertebrates, reptiles, amphibians, birds, and mammals in the project vicinity. Potential adverse effects include disturbance of individuals (e.g., nesting birds) in terrestrial, shoreline, and aquatic habitats due to encroachment by humans, domestic animals, and vehicles. These effects may include predation of native species by domestic animals and injury or mortality of individuals due to vehicular traffic. Large-scale, relatively intense usage of the site during events at the stadium would include the same potential for adverse effects listed above, as well as from directional lighting associated with the stadium, increased traffic, and additional noise. However, such events would be intermittent and would be similar to events currently taking place at Candlestick Point, less than 2 mi (3.2 km) away (and equally close to sensitive resources such as those present in Yosemite Slough). Adverse effects from human disturbance and other operational factors would occur primarily to small numbers of regionally abundant species. Wildlife species that occur in these types of urban areas would likely habituate to human presence, and effects would not substantially affect populations of these species. A resident pair of American peregrine falcons has been observed successfully nesting on the Re-Gunning Crane on Parcel D of HPS. Operations from the proposed action should not result in substantial adverse effects to the falcons' nesting activities as the current nesting pair has persisted and nested successfully at this site for several years even while remediation activities have been ongoing in the vicinity of the nest site. All project alternatives include leaving the Re-Gunning Crane in place and intact. Other raptors would benefit due to the improvement of existing parkland as a result of the restoration and management of native-dominated grassland, which would provide higher-quality foraging habitat.

All project alternatives propose to enhance habitat conditions for native plant and animal species following project construction. Specifically, the project includes enhancing the ecological functions and values of the land currently supporting non-native habitats on the project site. Revegetation and the addition of new parklands, including the Grassland Ecology Park, would enhance breeding, wintering, and migratory stopover habitat for birds and provide foraging opportunities for raptor prey species (such as small mammals and reptiles) that could result in a higher prey base for raptors. Some water birds (e.g., gulls, terns, cormorants, and pelicans) would benefit from the enhanced roosting sites offered by the three piers that would be disconnected from land and consequently inaccessible to humans and mammalian predators. Neotropical and other long-distance migrants (the landbird group using the site that is of greatest conservation concern) would receive a considerable net benefit.

Some of the measures that would be implemented on the project site would include: control of non-native invasive species, restoration of grasslands, increase in tree/shrub cover, maintenance of habitat connectivity, maintenance of refuge for waterbirds, and provision of nest boxes in areas that are currently highly degraded or disturbed. Specifically, extensive planting of native vegetation would enhance the vegetation community and provide areas of enhanced habitat for butterflies, birds, small mammals, reptiles, and amphibians on the project site. For most species, the benefits of such enhancements would accrue to local rather than regional populations because there is no substantive dispersal of most wildlife species between the site and offsite areas. However, in the case of migratory birds, the project would result in a net benefit that may have regional or flyway-level implications because the project would enhance foraging habitat that is used by birds breeding and wintering in areas far from the study area. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1, would not cause changes to sensitive communities, and impacts would *not be significant*.

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

There would be no terrestrial freshwater wetlands at the HPS project site after construction. Therefore, *no impacts* would occur as a result of operations. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1, would not cause changes to wetlands, and impacts would *not be significant*.

Factor 4: Movement/Migration

BIRD STRIKES

Within HPS, the residential towers would range from 240 to 350 ft (73-107 m) in height, and the stadium would be up to 156 ft (48 m) in height with the top of the stadium light towers at 192 ft (59 m). Migrating birds such as songbirds are vulnerable to collisions with human-built structures, especially when migrating at night and at low flight altitudes, and because of their tendency to be disoriented by artificial light. Both tall structures and the mirror or invisible effect of large windows can represent collision hazards to migrating birds. A majority of bird strikes occur when birds do not recognize windows as solid structures to be avoided. Large-scale avian injury or mortality due to bird strikes has not been documented at buildings on the West Coast as it has in Eastern and Midwestern North America. Operation of the towers and stadium (such as lighting) could increase hazards to migratory birds by altering flight patterns and increasing bird strike collision potential with the structures. Recognizing these hazards, environmental controls were incorporated into the proposed action (Section 2.3.2.1.9 Environmental Controls) to make the potential impacts associated with bird strikes at tall buildings on HPS *not significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1, would not cause changes to movement/migration of birds, and impacts would *not be significant*.

4.13.2.2.2 Marine and Aquatic Resources

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Maintenance dredging operations could cause temporary and localized increases in suspended sediments and a subsequent reduction in water quality conditions, and could cause temporary impacts to existing benthic communities. However, it is likely that these same types of species would recolonize within a relatively short period of time (few months to a year) (Nichols *et al*. 1990) from adjacent undisturbed areas. Therefore, impacts to benthic invertebrates would be *less than significant* and no mitigation is required.

Similar to temporary impacts described above under construction impacts to marine and aquatic resources , marina dredging activities could temporarily disturb designated critical habitat for green sturgeon and Central California Coast steelhead within the bay, and there is some possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, may be affected as well. However, these species are also mobile and are expected to leave the immediate areas during dredging operations and return after dredging is completed. In addition, dredging frequency is expected to be low (about once every five years) and confined to in-water work windows specified by the resource agencies. Even though the project site is located in designated critical habitat (San Francisco Bay) and could be visited infrequently by migrating salmon, steelhead, and green sturgeon, the project site is in an area considered to be highly urbanized and is unlikely to support appropriate critical habitat (e.g., substrate type) for any federally or state-listed threatened or endangered fish species. Based on the low probability of occurrence of these species in the project vicinity and the small area of habitat disturbance compared to the available habitat (entire bay), operational impacts on salmon, green sturgeon, or Central California Coast steelhead from maintenance dredging would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

MARINE AND OTHER AQUATIC BIRDS

Though HPS project alternatives include creation of habitat that should benefit native species, specific breeding habitat for either the California brown pelican or California least tern would not be created. Roosting habitat would continue to be present for California brown pelicans, and California least tern may utilize the coastal areas around the project site for foraging. Alternative 1 operations are not expected to positively or adversely affect the behavior of California brown pelicans or California least terns. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

MARINE MAMMALS

Operation of the marina and marina-related activities (personal watercraft operations) would have the potential to disturb marine mammals, including locally foraging harbor seals. There are no known pupping sites or major haulout locations where animals would be subject to increased disturbance from vessel traffic in the project site. Out of a 300-slip marina, only a small percentage of the boats docked there are expected to be in use at any one time. Therefore, considering the large size of the bay, the number of boats currently on the bay, and the amount of disturbance currently generated by those boats, the few boats that might be transiting from the marina into the bay are not expected to generate substantial additional disturbance over current conditions. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1, would not cause habitat modifications and impacts would *not be significant*.

Factor 2: Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS

The overall function of EFH habitat would not be substantially altered by dredging operations. Maintenance dredging has the potential to result in temporary disturbance of EFH species and their prey. EFH species would be able to move out of the disturbed areas during dredging activities and subsequently return after these activities have concluded. Impacts to prey species would be temporary and short-term (see below). Since eelgrass beds do not occur near the marina or Yosemite Slough area, no impacts are expected on eelgrass beds. Therefore, impacts on EFH from maintenance dredging would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

INVERTEBRATES AND FISHES

Marina operations following implementation of Alternative 1 would require routine maintenance dredging which could cause temporary impacts to existing benthic communities. Maintenance dredging operations are expected to be infrequent (about every five years), but could cause temporary and localized increases in suspended sediments and subsequent reduction in water quality conditions, along with removal of sediments and organisms at the dredging sites. These same types of species are expected to recolonize within a relatively short period of time (few months to a year) (Nichols *et al*. 1990) from adjacent undisturbed areas. Thus, long-term impacts to the benthic community would *not be significant* and no mitigation is required.

Impacts to fish communities from implementation of Alternative 1 would primarily be associated with temporary disturbance of bottom sediments and habitat during maintenance dredging operations. Fish species occurring in the immediate area may be temporarily displaced either by equipment and noise associated with dredging activities or to avoid short-term changes in suspended sediments and turbidity. Both demersal (i.e., bottom-oriented) and pelagic (water column) species may leave the immediate area due to dredging activities. Fish species are expected to move back into the marina area following the completion of dredging. Fish present during dredging activities would be capable of avoiding project equipment and areas temporarily affected by increased turbidity. Most if not all of the fish species occurring in the area routinely experience turbid conditions due to natural processes and ship traffic within the bay. In addition, measures to protect water quality and biological resources during construction of the bridge also would be specified in the Section 404/10 permit and 401 Water Quality Certification. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1 would not cause changes to invertebrates and fishes and impacts would *not be significant*.

Factor 3: Wetlands

In addition to artificial structures placed within the bay, the BCDC considers structures suspended above the bay or floating on the water to be "fill" and subject to their regulation. The "shadow fill" produced by the Yosemite Slough bridge also may partly affect the biological functions and values of aquatic and mudflat habitat. Such an impact would include 1.48 ac (0.60 ha) based on the surface area immediately below the bridge footprint. Included in these 1.48 ac (0.599 ha) are 0.004 ac (0.002 ha) of vegetated wetlands and 1.476 ac (0.597 ha) of other waters. The small area of vegetated wetlands affected by shadow fill would represent an adverse impact. Implementation of **Mitigation 2** would ensure no loss of wetland functions; therefore, impacts to wetlands from shadow fill would *not be significant*. Shadow fill would not result in the complete loss of functions and values of the aquatic habitats below the bridge; partial sunlight at different sun angles would reduce the area subject to permanent shadow. Because fish and aquatic organisms would continue to use the waters under the bridge, impacts due to shading would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

4.13.3 Alternative 1A: Stadium Plan/No-Bridge Alternative

4.13.3.1 Construction Impacts

4.13.3.1.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Alternative 1A would include the creation of native habitat, which would likely benefit many species. No threatened or endangered terrestrial wildlife species are expected to occur in the project vicinity. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause habitat modifications, and impacts would *not be significant*.

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Implementation of Alternative 1A would cause changes to vegetation, habitats, and wildlife that would be very similar to those described for Alternative 1. The primary difference would be that Yosemite Slough bridge would not be constructed. Impacts to 0.11 ac (0.04 ha) of mudflats and aquatic habitat would not occur and the use of coffer dams and other bridge construction activities would not be necessary. Construction noise, human presence, and dust would occur on portions of HPS, but would likely be reduced in the vicinity of Yosemite Slough. Implementation of **Mitigation 1** would further reduce the potential for impacts to ground-nesting birds and to bats and birds that roost/nest in buildings. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause changes to sensitive communities, and impacts would *not be significant*.

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

As noted for Alternative 1, project activities would permanently impact 0.17 ac (0.07 ha) of seasonal freshwater wetlands located inland at HPS. Permanent impacts are those that would remove wetlands and not replace them in the same location. Temporary impacts would be short term because, after construction, any areas disturbed would be restored to the previous condition. Direct removal, placement of fill into, or hydrological interruption of federally-protected wetlands that would result in a net loss of these areas would be considered an adverse effect. In addition, any removal of an established mitigation site would be considered an adverse effect. However, implementation of **Mitigation 2** would reduce impacts to seasonal freshwater wetlands to be *not significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause additional habitat modification, and impacts to biological resources would not be significant.

4.13.3.1.2 Marine and Aquatic Resources

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Similar to Alternative 1, development of the in-water components (e.g., shoreline improvements and construction of the marina), associated with Alternative 1A, by the future developer or landowner would potentially impact designated critical habitat. However, based on the low probability of occurrence of sensitive fish species in the project site area, the small area of habitat loss compared to the entire bay, implementation of monitoring and avoidance measures (e.g., BMPs, seasonal restrictions, etc.), and the approximate 8.5 ac of increase in fish habitat, impacts would *not be significant*.

The DoN has determined that the effects of the proposed action may effect, but is not likely to adversely affect species or adversely modify critical habitat. The DoN coordinated with, obtained technical assistance, and consulted with the NMFS pursuant to Section 7(a)(2) of the ESA, as amended, on this determination. The DoN received concurrence from NMFS on the determination that the "effects of the DoN's proposed transfer of surplus property at HPS, together with the effects of the Redevelopment Agency's planned reuse, an activity interrelated and/or interdependent with the DoN's action, are not likely to adversely affect threatened CCC (Central California Coast) steelhead, threatened southern DPS (district population segment) and designated critical habitat" (NMFS 2012). Appendix D includes copies of the DoN and NMFS consultation letters.

The future developer or owner of the property would be responsible for adhering to all applicable local, state, and federal environmental regulations and laws and for acquiring any applicable local, state, and federal permits and approvals required for development of the property, including all in-water development components (e.g., marina, shoreline improvements, etc.). It is anticipated that development actions would be subject to USACE permitting under the Clean Water Act (e.g., Section 404) or Rivers and Harbors Act of 1899 (e.g., Section 10). At such time that applications for federal permits are submitted and specific project details become available, USACE and NMFS would conduct Section 7 consultations pursuant to the ESA, and the EFH provisions of the MSA, as appropriate. BMPs recommended by NMFS (described above under Alternative 1 Factor 1) for in-water work relevant to shoreline improvements and marina development also would apply to Alternative 1A.

MARINE AND OTHER AQUATIC BIRDS

Similar to Alternative 1, marine and other aquatic bird species would not be impacted by implementation of Alternative 1A. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

MARINE MAMMALS

Marina construction would be the same as noted for Alternative 1, so impacts to marine mammals would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1A, would not cause habitat modifications, and impacts would *not be significant*.

Factor 2: Sensitive Communities

INVERTEBRATES AND FISHES

Similar to Alternative 1, temporary impacts to hard substrate used by invertebrates would occur during marina construction. For both hard-bottom and soft-bottom habitats, disturbed areas would be restored to their previous condition in a short amount of time (weeks to months) after construction is completed. Under a worst-case scenario (as described for Alternative 1), permanent effects to fish habitats would be short-term and localized for Alternative 1A and would *not be significant*. Because impacts to these resources would not be significant, no mitigation is proposed.

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS

Construction of Alternative 1A would not affect eelgrass beds in the project site area. Implementation of **Mitigation 2 and Mitigation 3** would reduce temporary impacts and residual impacts to EFH would *not be significant*. In addition, removal of structures and fill would restore approximately 8.5 ac (3.4 ha) of aquatic habitat, offsetting the loss of EFH that would result from placement of fill for buttresses.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause additional habitat modification, and impacts to biological resources would not be significant.

Factor 3: Wetlands

HABITATS

Based on elimination of the Yosemite Slough bridge option, impacts to 0.11 ac (0.04 ha) of mudflats and aquatic habitat around Yosemite Slough would not occur under Alternative 1A. All other permanent and temporary impacts to tidal and nontidal marshes, and other Waters of the U.S., as defined by Section 404 of the CWA (specifically, bay habitat) would occur under this alternative, as discussed for Alternative 1, including mitigation of wetland losses under **Mitigation 2**. Temporary impacts would be short term because, after construction, disturbed areas would be restored to the previous condition. Therefore, with implementation of **Mitigation 2**, residual impacts to wetlands from construction of Alternative 1A would *not be significant.*

4.13.3.2 Operational Impacts

4.13.3.2.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Because no threatened or endangered terrestrial wildlife species currently occur in the project vicinity, *no impacts* are anticipated from Alternative 1A operations. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1A, would not cause habitat modifications and impacts would *not be significant*.

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Alternative 1A would enhance habitat conditions for native plant and animal species by open space restoration following project construction. For Alternative 1A, in the absence of the Yosemite Slough bridge, the species in the immediate area would experience slightly less disturbance by the reduction in noise, vibration, and excess light that would be generated by bridge traffic under Alternative 1. Resident and common wildlife species that might move into the restored habitats would likely habituate to the expected increase in human presence in the parks, and effects would not substantially affect populations of these species. Therefore, impacts would *not be significant.* Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1A, would not cause changes to sensitive communities and impacts would *not be significant*.

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

There would be no terrestrial freshwater wetlands at the HPS site after construction. Therefore, *no impacts* would occur as a result of operations and no mitigation is required. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1A, would not cause changes to seasonal freshwater wetlands and impacts would *not be significant*.

Factor 4: Movement/Migration

BIRD STRIKES

To reduce the potential for bird strikes at buildings associated with HPS, bird strike environmental controls were incorporated into Alternative 1A (Section 2.3.2.1.9, Environmental Controls) to ensure that impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

4.13.3.2.2 Marine and Aquatic Resources

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Impacts to existing benthic habitats and organisms would be temporary and pre-disturbance invertebrate communities would be expected to recolonize the area after construction. Fish species, including managed fishes such as green sturgeon or Central California Coast steelhead, are mobile and would be able to move away during maintenance dredging. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

MARINE AND OTHER AQUATIC BIRDS

Similar to Alternative 1 operations, impacts to marine and aquatic birds that occur in the area from operation of Alternative 1A would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

MARINE MAMMALS

Marina operations are not expected to generate substantial additional disturbance over current conditions. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1A, would not cause habitat modifications, and impacts would *not be significant*.

Factor 2: Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS

No eelgrass occurs near the marina where dredging would occur, so these resources would not be affected by operation of Alternative 1A. Dredging impacts to EFH and species would be temporary, as noted for Alternative 1. Therefore, impacts to EFH and eelgrass would *not be significant.* Because impacts would not be significant, no mitigation is proposed

INVERTEBRATES AND FISHES

Similar to Habitat Modification (Factor 1) above, effects to invertebrate and fish communities from operations such as dredging would be temporary and localized and recolonization would occur within weeks to months. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D for Alternative 1A would not cause changes to sensitive communities and impacts would *not be significant*.

Factor 3: Wetlands

HABITATS

Based on elimination of the Yosemite Slough bridge option, the approximately 1.48 ac (0.60 ha) of "shadow fill" that would have been associated with the bridge would not occur. Because impacts would *not be significant*, no mitigation is proposed.

4.13.4 Alternative 2: Non-Stadium Plan/Additional R&D Alternative

4.13.4.1 Construction Impacts

4.13.4.1.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Impacts to terrestrial federally listed threatened and endangered plants and wildlife associated with construction activities for Alternative 2 would be comparable to those presented above for Alternative 1 because the construction methods and construction footprints would be similar, and these activities would be subject to the same regulations and permit conditions that would apply to Alternative 1. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2, would not cause habitat modifications, and impacts would *not be significant*.

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Impacts to terrestrial vegetation communities, habitats, and common wildlife associated with construction activities for Alternative 2 would be comparable to those presented above for Alternative 1 because the methods and footprints, including a Yosemite Slough bridge, would be similar and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1. This alternative would include the Building Preservation option that would not involve demolition or removal of Buildings 211, 224, 231, and 253. Under this scenario, **Mitigation 1** would be modified to include pre-construction nesting bird and bat surveys for only those buildings to be removed. This would further reduce potential impacts so they would *not be significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 2, would not cause changes to sensitive communities, and impacts would *not be significant*.

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

Impacts to terrestrial Waters of the U.S. for Alternative 2 would be comparable to those presented above for Alternative 1 because the methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1.

Direct removal, placement of fill into, or hydrological interruption of federally-protected wetlands that would result in a net loss of these areas would be considered an adverse effect. In addition, any removal of an established mitigation site would be considered an adverse effect. However, implementation of **Mitigation 2** would reduce the potential for impacts to seasonal freshwater wetlands.

Minor changes to the project footprint, associated with construction of the Tower Variant D or the Building Preservation option for Alternative 2, would not alter freshwater wetlands, and impacts would *not be significant*.

4.13.4.1.2 Marine and Aquatic Resources

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Similar to Alternative 1, construction activities during Alternative 2 would disturb designated critical habitat for green sturgeon and Central California Coast steelhead within the bay, and there is a possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, could be impacted by these activities as well. Even though the project site is located in designated critical habitat (San Francisco Bay) and could be visited infrequently by migrating salmon, steelhead, and green sturgeon, the project site is in an area considered to be highly urbanized and is unlikely to support appropriate critical habitat (e.g., substrate type) for any federally or state-listed threatened or endangered fish species. In addition, these species are found in low abundance in the project vicinity, are mobile, and would be able to avoid affected areas until construction activities have concluded. Moreover, it is anticipated that habitat for these species would return to its native state in a short period of time (weeks to months) following construction.

Some areas of shoreline that are currently sheet-pile walls would be modified, and portions of several piers would be removed to provide new aquatic habitat that could be used by these fish. Fish species, including sensitive species such as green sturgeon and Central California Coast steelhead may experience temporary and localized decreases in water quality (increased turbidity) from construction activities such as dredging and from pile driving. Since decreases in water quality conditions and disturbance from pile driving would occur over a short amount of time, fish would be able to leave areas during construction and return after these activities have concluded. Also, in-water construction work would occur during work windows designated by the resource agencies to prevent or minimize potentials for impacts to sensitive fish species. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Similar to Alternative 1, development of the in-water components (e.g., Yosemite Slough bridge, shoreline improvements, and construction of the marina), associated with Alternative 2, by the future developer or landowner would potentially impact designated critical habitat. However, based on the low probability of occurrence of sensitive fish species in the project site area, the small area of habitat loss compared to the entire bay, implementation of monitoring and avoidance measures (e.g., BMPs, seasonal restrictions, etc.), and the approximate 8.5 ac of increase in fish habitat, impacts would *not be significant*.

The DoN has determined that the effects of the proposed action may effect, but is not likely to adversely affect species or adversely modify critical habitat. The DoN coordinated with, obtained technical assistance, and consulted with the NMFS pursuant to Section 7(a)(2) of the ESA, as amended, on this determination. The DoN received concurrence from NMFS on the determination that the "effects of the DoN's proposed transfer of surplus property at HPS, together with the effects of the Redevelopment Agency's planned reuse, an activity interrelated and/or interdependent with the DoN's action, are not likely to adversely affect threatened CCC (Central California Coast) steelhead, threatened southern DPS (district population segment) and designated critical habitat" (NMFS 2012). Appendix D includes copies of the DoN and NMFS consultation letters.

The future developer or owner of the property would be responsible for adhering to all applicable local, state, and federal environmental regulations and laws and for acquiring any applicable local, state, and federal permits and approvals required for development of the property, including all in-water development components (e.g., marina, shoreline improvements, etc.). It is anticipated that development actions would be subject to USACE permitting under the Clean Water Act (e.g., Section 404) or Rivers and Harbors Act of 1899 (e.g., Section 10). At such time that applications for federal permits are submitted and specific project details become available, USACE and NMFS would conduct Section 7 consultations pursuant to the ESA, and the EFH provisions of the MSA, as appropriate. BMPs recommended by NMFS (described above under Alternative 1 Factor 1) also would apply to Alternative 2.

MARINE AND OTHER AQUATIC BIRDS, MARINE MAMMALS

Similar to Alternative 1, impacts to marine and other aquatic bird species from construction of Alternative 2 would *not be significant*. Similar to impacts described above for fish, construction activities during Alternative 2 could temporarily impact marine mammals by creating noise, primarily from pile driving that could disrupt behavior patterns. However, since few marine mammals occur in the project site area, sound pressure waves are expected to be below the guidelines for pinnipeds, and these individuals would be able to leave during construction periods and return when construction is concluded. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2, would not cause additional habitat modification, and impacts to biological resources would *not be significant*.

Factor 2: Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS

Modifications to EFH that could result from HPS would be associated with the proposed marina, placement of rock fill to buttress existing bulkheads, and the shoreline treatments. Construction of Alternative 2 would not affect eelgrass beds in the project site area. The most substantial loss of EFH would result from the placement of rock buttress fill necessary to protect the integrity of existing bulkheads. Although aquatic habitat would remain above the buttresses, this rock would occupy existing fish habitat. Implementation of **Mitigation 2 and Mitigation 3** would reduce temporary impacts and the residual impacts to EFH would *not be significant*. In addition, removal of structures and fill would restore approximately 8.5 ac (3.4 ha) of aquatic habitat, offsetting the loss of EFH that would result from placement of fill for buttresses.

INVERTEBRATES AND FISHES

Alternative 2 would have a similar footprint as Alternative 1, affecting approximately 22 ac (9 ha) of aquatic habitat. However, impacts would be short term because, after construction, any disturbed areas would be restored to the previous condition. Shoreline improvements for Alternative 2 would temporarily affect substrate used by oysters and mussels, but would not substantially reduce populations or available habitat. The creation of a new marina for this alternative would require installation of two breakwater sections that would provide suitable habitat for settling organisms such as mussels and oysters.

Noise levels generated by pile driving during construction activities would be same as described above for Alternative 1 and have the potential to impact sensitive fish species. Marina and Yosemite Slough bridge construction would require piles be driven/installed and could result in noise impacts to fishes in the area. However, mobile fish species would be able to move out of the area during construction activities and subsequently return to the area after these activities have concluded. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2, would not cause changes to biological resources, and impacts would *not be significant.*

Factor 3: Wetlands

HABITATS

Similar to Alternative 1, construction activities for Alternative 2 would impact jurisdictional waters and a small amount of tidal and non-tidal marsh. Implementation of **Mitigation 2** would replace wetland losses; therefore, impacts to wetlands would *not be significant*.

4.13.4.2 Operational Impacts

4.13.4.2.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Impacts to terrestrial federally listed threatened and endangered plants and wildlife in the HPS project site associated with operations for Alternative 2 would be comparable to those described above for Alternative 1. Since the most significant difference in project scope between Alternative 1 and Alternative 2 would be replacement of the stadium with other man-made structures, the habitat effects for terrestrial federally listed threatened and endangered plants and wildlife would be similar. In addition, the Grassland Ecology Park would remain for this alternative, without a substantial change in acreage, thereby creating native habitat. Therefore, impacts would *not be significant* to terrestrial federally listed threatened and endangered plants and wildlife. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with the Tower Variant D or the Building Preservation option for Alternative 2, would not cause habitat modifications for biological resources, and impacts would *not be significant.*

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Impacts to terrestrial vegetation communities, habitats, and common wildlife in the HPS project site associated with operations for Alternative 2 would be comparable to those presented above for Alternative 1. Because the biggest difference in project scope would be the replacement of the stadium with other man-made structures, the area available for vegetation communities, habitats, and common wildlife species would be similar. In addition, the Grassland Ecology Park would remain in this alternative, without a substantial change in acreage, and thereby creating native habitat.

Alternative 2 does not incorporate the Draft Parks, Open Space, and Habitat Concept Plan, which is unique to Alternative 1 (Stadium Plan Alternative), although the acreages for the natural areas of the Grassland Ecology Park – under which this plan would be implemented – would not vary substantially between Alternatives 1 and 2. Alternative 2, like Alternative 1, would create habitat for native species to utilize, thereby increasing the potential for native species to occupy the HPS project site. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option for Alternative 2, would not cause changes to sensitive communities, and impacts would *not be significant.*

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

Impacts to terrestrial freshwater wetlands on the HPS project site associated with operations for Alternative 2 would be comparable to those presented above for Alternative 1. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option for Alternative 2, would not cause changes to seasonal freshwater wetlands, and impacts would *not be significant.*

Factor 4: Movement/Migration

BIRD STRIKES

Since Alternative 2 would construct research and development buildings instead of a new stadium, the frequency of bird strikes could be different from that expected for Alternative 1. While the stadium and associated light towers would not be the tallest structures on the proposed HPS project site under Alternative 1, the relatively greater lighting for the stadium could become more disorienting for migrating birds. Even though Alternative 2 includes buildings that would be lit at night and represent hazards to migrating birds, this effect would likely be less than lighting associated with a stadium. Implementation of the environmental controls (Section 2.3.2.1.9, Environmental Controls) would result in impacts to migrating birds that would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option for Alternative 2, would not cause changes to bird movement/migration, and impacts would *not be significant.*

4.13.4.2.2 Marine and Aquatic Resources

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Impacts to aquatic resources from operation of Alternative 2 would be similar to those discussed above for Alternative 1. Impacts from operation of the marina would include temporary and localized increases in suspended sediments from maintenance dredging operations. However, since dredging would be required infrequently (about every five years), aquatic resources would only experience temporary and localized decreases in water quality conditions in the marina area. Impacts to existing benthic habitats and organisms would be temporary and pre-disturbance invertebrate communities would be expected to recolonize the area after construction. Similar to the temporary impacts described above for common fishes, marina dredging activities also could temporarily disturb designated critical habitat for green sturgeon and Central California Coast steelhead within the bay, and there is some possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, could be impacted. However, these species are expected to occur in low abundance in the project vicinity, are mobile, and are expected to leave the immediate areas during dredging operations and return after dredging is completed. In addition, dredging frequency would be low (about every five years), and dredging would only occur during work windows designated by the resource agencies to prevent or minimize potential effects to sensitive fish species. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

MARINE AND OTHER AQUATIC BIRDS, MARINE MAMMALS

Similar to Alternative 1, operational impacts to marine and other aquatic bird species with implementation of Alternative 2 would *not be significant*. Operation of the marina and marina-related activities (personal watercraft operations) would have the potential to disturb marine mammals, including locally foraging harbor seals. However, as described above, there are no known pupping sites or major haulout locations where animals would be subject to increased disturbance from vessel traffic in the project site area. Therefore, impacts would *not be significant.* Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option for Alternative 2, would not cause changes to biological resources, and impacts would *not be significant.*

Factor 2: Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS

The overall function of EFH habitat would not be substantially altered by dredging operations and EFH species would be able to move out of the disturbed areas during dredging activities and subsequently return after these activities have concluded. Impacts to prey species would be temporary and short-term. Since eelgrass beds do not occur near the marina, no effects to eelgrass are expected. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Factor 3: Wetlands

HABITATS

Similar to Alternative 1, shadow fill from construction of the Yosemite Slough bridge would impact a small area of vegetated wetlands and waters. Implementation of Mitigation 2 would ensure no loss of wetlands, therefore, impacts to wetlands would *not be significant*. Shadow fill would not result in complete loss of the function and value of the aquatic habitats below the bridge. Because fish and aquatic organisms would continue to use the waters under the bridge, impacts due to shading would *not be significant*.

4.13.5 Alternative 2A: Non-Stadium Plan/Housing and R&D Alternative

4.13.5.1 Construction Impacts

4.13.5.1.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Impacts to federally listed threatened and endangered plants and wildlife for Alternative 2A would be comparable to those presented above for Alternative 2 because the construction methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 2. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of the Tower Variant D or the Building Preservation option for Alternative 2A, would not cause additional habitat modification, and impacts to biological resources would not be different for this factor.

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Impacts to terrestrial vegetation communities, habitats, and common wildlife associated with construction activities for Alternative 2A would be comparable to those described above for Alternative 2 because the methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 2. One difference is the addition of a road that bisects the park and open space, which may reduce habitat value slightly due to localized habitat fragmentation, especially for smaller wildlife species. As described for Alternative 2, this alternative also would include the Building Preservation option. Therefore, **Mitigation 1** would be modified to include pre-construction nesting bird and bat surveys for only those buildings to be removed and similarly ensuring that residual impacts would *not be significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 1, would not cause additional habitat modification, and impacts to biological resources would not be different for this factor.

Factor 3: Inland Wetlands

SEASONAL FRESHWATER WETLANDS

Impacts to terrestrial Waters of the U.S. for Alternative 2A would be comparable to those presented above for Alternative 2 because the construction methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1. With implementation of **Mitigation 2** residual impacts to freshwater wetlands would *not be significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option for Alternative 2A, would not cause additional habitat modification, and impacts to biological resources would not be different for this factor.

4.13.5.1.2 Marine and Aquatic Resources

Impacts associated with construction of this alternative would be the same as described above for Alternatives 1 and 2.

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Similar to Alternative 1, development of the in-water components (e.g., Yosemite Slough bridge, shoreline improvements, and construction of the marina), associated with Alternative 2A, by the future developer or landowner would potentially impact designated critical habitat. However, based on the low probability of occurrence of sensitive fish species in the project site area, the small area of habitat loss compared to the entire bay, implementation of monitoring and avoidance measures (e.g., BMPs, seasonal restrictions, etc.), and the approximate 8.5 ac of increase in fish habitat, impacts would *not be significant*.

The DoN has determined that the effects of the proposed action may effect, but is not likely to adversely affect species or adversely modify critical habitat. The DoN coordinated with, obtained technical assistance, and consulted with the NMFS pursuant to Section 7(a)(2) of the ESA, as amended, on this determination. The DoN received concurrence from NMFS on the determination that the "effects of the DoN's proposed transfer of surplus property at HPS, together with the effects of the Redevelopment Agency's planned reuse, an activity interrelated and/or interdependent with the DoN's action, are not likely to adversely affect threatened CCC (Central California Coast) steelhead, threatened southern DPS (district population segment) and designated critical habitat" (NMFS 2012). Appendix D includes copies of the DoN and NMFS consultation letters.

The future developer or owner of the property would be responsible for adhering to all applicable local, state, and federal environmental regulations and laws and for acquiring any applicable local, state, and federal permits and approvals required for development of the property, including all in-water development components (e.g., marina, shoreline improvements, etc.). It is anticipated that development actions would be subject to USACE permitting under the Clean Water Act (e.g., Section 404) or Rivers and Harbors Act of 1899 (e.g., Section 10). At such time that applications for federal permits are submitted and specific project details become available, USACE and NMFS would conduct Section 7 consultations pursuant to the ESA, and the EFH provisions of the MSA, as appropriate. BMPs recommended by NMFS (described above under Alternative 1 Factor 1) also would apply to Alternative 2A.

MARINE AND OTHER AQUATIC BIRDS, MARINE MAMMALS

Similar to Alternatives 1 and 2, impacts to marine and other aquatic bird species from construction of Alternative 2A would *not be significant*. Similar to impacts described above for fish, construction activities during Alternative 2A could temporarily impact marine mammals by creating noise, primarily from pile driving that could disrupt behavior patterns. However, since few marine mammals occur in the project site area, sound pressure waves are expected to be below the guidelines for pinnipeds, and these individuals would be able to leave during construction periods and return when construction is concluded. Therefore, impacts would *not be significant*.

Factor 2 Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS, INVERTEBRATES AND FISHES,

Construction of Alternative 2A would not affect eelgrass beds in the project site area. The most substantial loss of EFH would result from the placement of rock buttress fill necessary to protect the integrity of existing bulkheads. Although aquatic habitat would remain above the buttresses, this rock would occupy existing fish habitat. Implementation of **Mitigation 2 and Mitigation 3** would reduce temporary impacts and the residual impacts to EFH would *not be significant*. In addition, removal of structures and fill would restore approximately 8.5 ac (3.4 ha) of aquatic habitat, offsetting the loss of EFH that would result from placement of fill for buttresses.

Potential effects to EFH species and their prey would be temporary and localized and would return to pre-disturbance conditions in a short period (weeks to months) following construction. Also, the overall function of EFH habitat would not be altered by this alternative, and species that use EFH would be able to move away from construction activities and subsequently return after these activities were concluded. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

Factor 3: Wetlands

HABITATS

Similar to Alternatives 1 and 2, construction activities for Alternative 2A would impact jurisdictional waters and a small amount of tidal and non-tidal marsh. Implementation of **Mitigation 2** would replace wetland losses; therefore, impacts to wetlands would *not be significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

4.13.5.2 Operational Impacts

4.13.5.2.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Because no threatened or endangered terrestrial wildlife species currently occur in the project vicinity, *no impacts* are anticipated from Alternative 2A operations. Because no impacts would occur, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option would not cause habitat modifications, and impacts would *not be significant.*

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Operational impacts to terrestrial vegetation communities, habitats, and common wildlife expected on the HPS project site under Alternative 2A would be comparable to those presented above for Alternative 2. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

No terrestrial freshwater wetlands would remain on the HPS site after construction. Therefore, impacts from operations would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause changes to seasonal freshwater wetlands, and impacts would *not be significant.*

Factor 4: Movement/Migration

BIRD STRIKES

Implementation of bird strike environmental controls (Section 2.3.2.1.9, Environmental Controls) would ensure that potential impacts to migrating birds would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause changes to bird movement/migration, and impacts would *not be significant.*

4.13.5.2.2 Marine and Aquatic Resources

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES, MARINE AND OTHER AQUATIC BIRDS, MARINE MAMMALS

Impacts from operation of the marina, such as dredging, would cause temporary and localized decreases in water quality. However, most species would either be tolerant of the conditions, such as sessile invertebrates, or mobile species such as fishes, invertebrates, aquatic birds, and marine mammals could move away and return once conditions improve. Impacts to existing benthic habitats and organisms would be temporary and pre-disturbance invertebrate communities would be expected to recolonize the area after construction. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

Factor 2: Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS, INVERTEBRATES AND FISHES

Operations impacts to EFH and species would be the same as described above for Habitat Modification. Therefore, impacts to sensitive aquatic communities would *not be significant*. Since eelgrass beds do *not* occur near the marina, no impacts to eelgrass are expected. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause changes to sensitive communities, and impacts would *not be significant.*

Factor 3: Wetlands

HABITATS

Similar to Alternatives 1 and 2, shadow fill from construction of the Yosemite Slough bridge would impact a small area of vegetated wetlands and jurisdictional waters. Implementation of Mitigation 2 would ensure no loss of wetlands, therefore, impacts to wetlands would *not be significant*. Shadow fill would not result in complete loss of the function and value of the aquatic habitats below the bridge. Because fish and aquatic organisms would continue to use the waters under the bridge, impacts due to shading would *not be significant*.

4.13.6 Alternative 3: Non-Stadium Plan/Additional Housing Alternative

4.13.6.1 Construction Impacts

4.13.6.1.1 Terrestrial Resources

Factor 1: Habitat Modification

Impacts to terrestrial federally listed threatened and endangered plants and wildlife habitats associated with construction activities for Alternative 3 would be comparable to those presented above for Alternative 2 because the methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions. Therefore, impacts to these resources would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Impacts to terrestrial vegetation communities, habitats, and common wildlife associated with construction activities for Alternative 3 would be comparable to those described above for Alternative 2 because the methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would be apply to Alternative 2. As for Alternatives 2 and 2A, this alternative would include the Building Preservation option. Therefore, **Mitigation 1** would be modified to include pre-construction nesting bird and bat surveys for only those buildings to be removed and similarly ensuring that residual impacts would *not be significant*.

Minor changes to the project footprint, associated with construction of Tower Variant D for Alternative 3, would not cause changes to sensitive communities, and impacts would *not be significant.*

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

Impacts to terrestrial Waters of the U.S. for Alternative 3 would be comparable to those presented above for Alternative 2 because the construction methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 1. Direct removal, placement of fill into, or hydrological interruption of federally-protected wetlands that would result in a net loss of these areas would be considered an adverse effect. In addition, any removal of an established mitigation site would be considered an adverse effect. However, implementation of **Mitigation 2** would further reduce the potential for impacts to seasonal freshwater wetlands to *not be significant*.

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Impacts to federally-listed threatened and endangered plants and wildlife for Alternative 3 would be comparable to those presented above for Alternative 2 because the construction methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions that would apply to Alternative 2. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause changes to seasonal freshwater wetlands, and impacts would *not be significant.*

4.13.6.1.2 Marine and Aquatic Resources

Impacts to aquatic habitats associated with construction activities for Alternative 3 would be comparable to those presented above for Alternatives 1 and 2 because the methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions.

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Alternative 3 would have a similar footprint as Alternatives 1 and 2, affecting approximately 22 ac (9 ha) of aquatic habitat. Similarly, impacts would be short term because disturbed areas would be restored to the previous condition after construction. Shoreline improvements for Alternative 3 would be the same as described above for Alternative 1 and would temporarily affect substrate used by oysters and mussels, but would not substantially reduce populations or available habitat. The creation of a new marina would provide new suitable habitat for settling organisms such as mussels and oysters. Noise levels generated by pile driving during construction activities would be same as described above for Alternatives 1 and 2. These disturbances have the potential to impact fish species. However, mobile fish species would be able to move out of the area during construction activities and subsequently return to the area after these activities have concluded, effectively avoiding any noise impacts. Similar to the alternatives described above, construction activities during Alternative 3 would disturb designated critical habitat for green sturgeon and Central California Coast steelhead within the bay. However, even though the project site is located in designated critical habitat (San Francisco Bay) and could be visited infrequently by migrating salmon, steelhead, and green sturgeon, the project site is in an area considered to be highly urbanized and is unlikely to support appropriate critical habitat (e.g., substrate type) for any federally or state-listed threatened or endangered fish species. In addition, these species are mobile and would be able to utilize similar habitat throughout the bay until construction activities were concluded. It is anticipated that habitat for these species would return to its native state in a short period (weeks to months) following construction activities. Sensitive fish species, including green sturgeon and Central California Coast steelhead may experience temporary and localized decreases in water quality (increased turbidity) from construction activities such as dredging and pile driving. However, decreases in water quality conditions would occur over a short amount of time and fish would be able to leave areas during construction and return after these activities have concluded.

Similar to Alternative 1, development of the in-water components (e.g., Yosemite Slough bridge, shoreline improvements, and construction of the marina), associated with Alternative 3, by the future developer or landowner would potentially impact designated critical habitat. However, based on the low probability of occurrence of sensitive fish species in the project site area, the small area of habitat loss compared to the entire bay, implementation of monitoring and avoidance measures (e.g., BMPs, seasonal restrictions, etc.), and the approximate 8.5 ac of increase in fish habitat, impacts would *not be significant*.

The DoN has determined that the effects of the proposed action may effect, but is not likely to adversely affect species or adversely modify critical habitat. The DoN coordinated with, obtained technical assistance, and consulted with the NMFS pursuant to Section 7(a)(2) of the ESA, as amended, on this determination. The DoN received concurrence from NMFS on the determination that the "effects of the DoN's proposed transfer of surplus property at HPS, together with the effects of the Redevelopment Agency's planned reuse, an activity interrelated and/or interdependent with the DoN's action, are not likely to adversely affect threatened CCC (Central California Coast) steelhead, threatened southern DPS (district population segment) and designated critical habitat" (NMFS 2012). Appendix D includes copies of the DoN and NMFS consultation letters.

The future developer or owner of the property would be responsible for adhering to all applicable local, state, and federal environmental regulations and laws and for acquiring any applicable local, state, and federal permits and approvals required for development of the property, including all in-water development components (e.g., marina, shoreline improvements, etc.). It is anticipated that development actions would be subject to USACE permitting under the Clean Water Act (e.g., Section 404) or Rivers and Harbors Act of 1899 (e.g., Section 10). At such time that applications for federal permits are submitted and specific project details become available, USACE and NMFS would conduct Section 7 consultations pursuant to the ESA, and the EFH provisions of the MSA, as appropriate. BMPs recommended by NMFS (described above under Alternative 1 Factor 1) also would apply to Alternative 3.

MARINE AND OTHER AQUATIC BIRDS, MARINE MAMMALS

Similar to Alternatives 1 and 2, impacts to marine and other aquatic bird species from construction of Alternative 3 would *not be significant*. Similar to impacts described above for fish, construction activities during Alternative 3 could temporarily impact marine mammals by creating noise, primarily from pile driving that could disrupt behavior patterns. However, few marine mammals occur in the project site area, and these individuals would be able to leave during construction periods and return when construction is concluded. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant*.

Factor 2: Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS, INVERTEBRATES AND FISHES

Modifications to EFH would result from construction of the proposed marina, placement of rock fill to buttress existing bulkheads, and the shoreline treatments. The most substantial loss of EFH would result from the placement of rock buttress fill necessary to protect the integrity of existing bulkheads. Although aquatic habitat would remain above the buttresses, this rock would occupy existing fish habitat. With implementation of **Mitigation 2 and Mitigation 3**, as noted for Alternatives 1 and 2, temporary and residual impacts to EFH would *not be significant*. In addition, removal of structures and fill would restore approximately 8.5 ac (3.4 ha) of aquatic habitat, offsetting the loss of EFH that would result from placement of fill for buttresses. Potential effects to EFH species and their prey would be temporary and localized and would return to pre-disturbance conditions in a short period (weeks to months) following construction. Also, the overall function of EFH habitat would not be altered by this alternative, and species that use EFH would be able to move away from construction activities and subsequently return after these activities were concluded. Therefore, impacts to invertebrates and fishes would *not be significant*. Minor changes to the project footprint, associated with construction of Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant*.

Factor 3: Wetlands

HABITATS

Similar to Alternatives 1 and 2, construction activities for Alternative 3 would impact jurisdictional waters and a small amount of tidal and non-tidal marsh. Implementation of **Mitigation 2** would replace wetland losses; therefore, impacts to wetlands would *not be significant*.

4.13.6.2 Operational Impacts

4.13.6.2.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Impacts to terrestrial federally listed threatened and endangered plants and wildlife on the HPS project site associated with operations for Alternative 3 would be comparable to those presented above for Alternative 1. Because the biggest difference in project scope would be replacement of the stadium with other man-made structures, the habitat changes for terrestrial federally listed threatened and endangered plants and wildlife would be similar. In addition, the Grassland Ecology Park would remain part of this alternative without a substantial change in acreage, thereby creating native habitat. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Impacts to terrestrial vegetation communities, habitats, and common wildlife on the HPS project site associated with operations for Alternative 3 would be comparable to those presented above for Alternative 2. Because the biggest difference in project scope would be replacement of the stadium with other man-made structures the area for vegetation communities, habitats, and common wildlife species would be similar. In addition, the Grassland Ecology Park would remain in this alternative without a substantial change in acreage, thereby creating native habitat. This alternative does not incorporate the Draft Parks, Open Space, and Habitat Concept Plan, which is unique to the Stadium Plan alternative (Alternative 1), although the acreages for the natural areas of the Grassland Ecology Park would not vary substantially between Alternatives 1 and 3. Alternative 3, like Alternative 1, would create natural communities for native species to utilize, thereby increasing the potential for native species to occupy the HPS project site. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

Impacts to terrestrial freshwater wetlands on the HPS project site associated with operations for Alternative 3 would be comparable to those presented above for Alternative 1 and would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

Factor 4: Movement/Migration

BIRD STRIKES

Because this alternative would construct additional housing instead of a new stadium, the frequency of bird strikes could be different from that expected under Alternative 1. While the stadium and associated light towers would not be the tallest structures on the proposed HPS project site under Alternative 1, the relatively more extreme lighting for stadium activities could have a more disorienting effect for migrating birds. Alternative 3 also includes buildings that would represent hazards to migrating birds; however, this alternative would likely reduce potential impacts on birds since the additive effect of the stadium lights with those of other buildings would be absent. Implementation of the bird strike environmental controls (Section 2.3.2.1.9, Environmental Controls) would reduce potential impacts to migrating birds. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

4.13.6.2.2 Marine and Aquatic Resources

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Marina dredging activities could temporarily disturb designated critical habitat for green sturgeon and Central California Coast steelhead within the bay, and there is some possibility that individuals of these species, as well as other special-status fish such as Chinook salmon and longfin smelt, could be impacted by these activities. However, these species are also mobile and would be expected to leave the immediate area during dredging operations and return after dredging is completed. In addition, dredging frequency is expected to be low (about every five years) and dredging would only occur during in-water work windows specified by the resource agencies for preventing or minimizing potential impacts to sensitive fish species. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

MARINE AND OTHER AQUATIC BIRDS, MARINE MAMMALS

Similar to Alternatives 1 and 2, operational impacts to marine and other aquatic bird species with implementation of Alternative 3 would *not be significant*. Operation of the marina and marina-related activities (e.g., personal watercraft operation) would have the potential to disturb marine mammals, including locally foraging harbor seals. However, there are no known pupping sites or major haulout locations where animals would be subject to increased disturbance from vessel traffic in the project site area. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

Factor 2: Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS, INVERTEBRATES AND FISHES

Impacts to aquatic habitat and resources from operation of Alternative 3 would be similar to those discussed above for Alternatives 1 and 2. The overall function of EFH habitat would not be substantially altered by dredging operations. Maintenance dredging has the potential to result in temporary disturbance of EFH species and their prey. EFH species would be able to move out of the disturbed areas during dredging activities and subsequently return after these activities have concluded. Impacts to prey species would be temporary and short-term. Since eelgrass beds do not occur near the marina, no impacts on eelgrass beds are expected. Therefore, impacts on EFH from maintenance dredging would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Impacts from the operation of the marina would include temporary and localized increases in suspended sediments from maintenance dredging operations. However, since dredging would be required infrequently (about every five years), aquatic resources would only experience decreased water quality conditions on a temporary and localized basis. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Minor changes to the project footprint, associated with Tower Variant D or the Building Preservation option, would not cause habitat modifications, and impacts would *not be significant.*

Factor 3: Wetlands

HABITATS

Similar to Alternatives 1 and 2, shadow fill from construction of the Yosemite Slough bridge would impact a small area of vegetated wetlands and waters with. Implementation of Mitigation 2 would ensure no loss of wetlands, therefore, impacts to wetlands would *not be significant*. Shadow fill would not result in complete loss of the function and value of the aquatic habitats below the bridge. Because fish and aquatic organisms would continue to use the waters under the bridge, impacts due to shading would *not be significant.*

4.13.7 Alternative 4: Non-Stadium Plan/Reduced Development Alternative

4.13.7.1 Construction Impacts

4.13.7.1.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Impacts to terrestrial federally listed threatened and endangered plants and wildlife associated with construction activities for Alternative 4 would be comparable to those presented above for Alternative 1 because the methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Impacts to terrestrial vegetation communities, habitats, and common wildlife associated with construction activities for Alternative 4 would be comparable to those presented above for Alternative 1 because the construction methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions. Therefore, impacts would *not be significant*. However, **Mitigation 1** would be implemented to further reduce potential impacts.

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

Impacts to terrestrial Waters of the U.S. for Alternative 4 would be comparable to those presented above for Alternative 1 because the methods and footprints would be similar, and construction activities would be subject to the same regulations and permit conditions. Direct removal, placement of fill into, or hydrological interruption of federally protected wetlands that would result in a net loss of these areas would be considered an adverse effect. In addition, any removal of an established mitigation site would be considered an adverse effect. However, implementation of **Mitigation 2** would reduce the potential for impacts to seasonal freshwater wetlands to *not be significant*.

4.13.7.1.2 Marine and Aquatic Resources

While Alternative 4 would have temporary and localized construction impacts as described above for Alternative 1, disturbed areas would be smaller because the Yosemite Slough bridge and the marina would not be constructed. Shoreline improvements for Alternative 4 would be the same as described for Alternative 1 and temporary impacts to hard substrate used by invertebrates would occur during construction.

Noise levels generated during construction activities would be less than described above for Alternative 1 because pile driving associated with bridge and marina construction would not occur. Temporary noise increases associated with shoreline improvements have the potential to impact sensitive fish species; however, it is likely that mobile fish species would be able to move out of the area during construction and subsequently return to the area after these activities have concluded, effectively avoiding significant noise impacts. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Similar to Alternative 1, development of the in-water components (e.g., shoreline improvements), associated with Alternative 4, by the future developer or landowner would potentially impact designated critical habitat. However, based on the low probability of occurrence of sensitive fish species in the project site area, the small area of habitat loss compared to the entire bay, implementation of monitoring and avoidance measures (e.g., BMPs, seasonal restrictions, etc.), and the approximate 8.5 ac of increase in fish habitat, impacts would *not be significant*.

The DoN has determined that the effects of the proposed action may effect, but is not likely to adversely affect species or adversely modify critical habitat. The DoN coordinated with, obtained technical assistance, and consulted with the NMFS pursuant to Section 7(a)(2) of the ESA, as amended, on this determination. The DoN received concurrence from NMFS on the determination that the "effects of the DoN's proposed transfer of surplus property at HPS, together with the effects of the Redevelopment Agency's planned reuse, an activity interrelated and/or interdependent with the DoN's action, are not likely to adversely affect threatened CCC (Central California Coast) steelhead, threatened southern DPS (district population segment) and designated critical habitat" (NMFS 2012). Appendix D includes copies of the DoN and NMFS consultation letters.

The future developer or owner of the property would be responsible for adhering to all applicable local, state, and federal environmental regulations and laws and for acquiring any applicable local, state, and federal permits and approvals required for development of the property, including all in-water development components (e.g., marina, shoreline improvements, etc.). It is anticipated that development actions would be subject to USACE permitting under the Clean Water Act (e.g., Section 404) or Rivers and Harbors Act of 1899 (e.g., Section 10). At such time that applications for federal permits are submitted and specific project details become available, USACE and NMFS would conduct Section 7 consultations pursuant to the ESA, and the EFH provisions of the MSA, as appropriate. BMPs recommended by NMFS (described above under Alternative 1 Factor 1) also would apply to Alternative 4.

MARINE AND OTHER AQUATIC BIRDS, MARINE MAMMALS

Similar to impacts described above for fish, construction activities during Alternative 4 could temporarily disturb marine mammals by creating noise that could disrupt behavior patterns. However, because few marine mammals occur in the project site, and these individuals would be able to leave during construction periods and return when construction is concluded, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Factor 2: Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS, INVERTEBRATES AND FISH

Modifications to EFH could arise from placement of rock fill to buttress existing bulkheads and the shoreline treatments. The most substantial loss of EFH would result from the placement of rock buttress fill necessary to protect the integrity of existing bulkheads. Although aquatic habitat would remain above the buttresses, this rock would occupy existing fish habitat. These modifications would result in adverse impacts to EFH. With implementation of **Mitigation 2** and **Mitigation 3**, temporary impacts would be minimized and the residual impacts to EFH would *not be significant*. In addition, removal of structures and fill would restore approximately 8.5 ac (3.4 ha) of aquatic habitat, offsetting the loss of EFH that would result from placement of fill for buttresses. No mapped eelgrass beds are documented where the shoreline improvements would occur. Therefore, no impacts to eelgrass would occur.

Potential effects to EFH species and their prey would be temporary and localized and would return to pre-disturbance conditions in a short period (weeks to months) following construction. Also, the overall function of EFH habitat would not be altered by this alternative, and species that use EFH would be able to move away from construction activities and subsequently return after these activities were concluded. Therefore, impacts to invertebrates and fishes would *not be significant*.

Factor 3: Wetlands

HABITATS

Based on elimination of the Yosemite Slough bridge option, impacts to 0.11 ac (0.04 ha) of mudflats and aquatic habitat around Yosemite Slough would not occur under Alternative 4. All other permanent and temporary impacts to tidal and non-tidal marshes would be similar to Alternative 1, and disturbance of jurisdictional waters would be less without the bridge or marina options. Temporary impacts would be short term because, after construction, disturbed areas would recover to the previous condition. With implementation of **Mitigation 2**, residual impacts to wetlands from construction of Alternative 4 would *not be significant*.

4.13.7.2 Operational Impacts

4.13.7.2.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Impacts to terrestrial federally listed threatened and endangered plants and wildlife on the HPS project site associated with operations for Alternative 4 would be comparable to those describe above for Alternative 1. Because the biggest difference in project scope would be replacement of the stadium with other man-made structures for Alternative 4, the habitat changes for terrestrial federally listed threatened and endangered plants and wildlife would be similar. In addition, the Grassland Ecology Park would remain part of this alternative without a substantial change in acreage and thereby creating native habitat. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Impacts to terrestrial vegetation communities, habitats, and common wildlife on the HPS project site associated with operations for Alternative 4 would be comparable to those presented for Alternative 1. Because the biggest difference in project scope would be replacement of the stadium with other man-made structures for Alternative 4, the area for vegetation communities, habitats, and common wildlife species would be similar. In addition, the Grassland Ecology Park would remain in this alternative without a substantial change in acreage, thereby creating native habitat. This alternative does not incorporate the Draft Parks, Open Space, and Habitat Concept Plan, which is unique to Alternative 1 (Stadium Plan Alternative), although the acreages for the natural areas of the Grassland Ecology Park would not vary between Alternatives 1 and 4. Alternative 4, like Alternative 1, would create natural communities for native species to utilize, thereby increasing the viability of native species on the HPS project site. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

Impacts to terrestrial freshwater wetlands on the HPS project site associated with operations for Alternative 4 would be comparable to those presented above for Alternative 1. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

Factor 4: Movement/Migration

BIRD STRIKES

Because this alternative would result in reduced development, including no stadium, the frequency of bird strikes would be reduced in comparison to the other alternatives. Alternative 4 still includes buildings which would represent hazards to migrating birds, but would likely reduce potential impacts on birds compared with Alternative 1 because the additive effect of the disorienting lights of the stadium and the buildings would be absent. Implementation of the bird strike environmental controls (Section 2.3.2.1.9, Environmental Controls) would further reduce the likelihood of impacts to migrating birds. Therefore, impacts would *not be significant*. Because impacts would not be significant, no mitigation is proposed.

4.13.7.2.2 Marine and Aquatic Resources

Factor 1: Habitat Modification

COMMON AND SENSITIVE FISH SPECIES

Because this alternative would result in reduced development, including no marina, no operational impacts to marine resources from maintenance dredging would occur. Therefore, operational impacts would not occur. Because impacts would not occur, no mitigation is proposed.

MARINE AND OTHER AQUATIC BIRDS, MARINE MAMMALS

Operational impacts to marine and other aquatic birds and marine mammals from operation of Alternative 4 would be less than described above for Alternatives 1, 2, and 3 because no marina would be constructed and, consequently, would not be significant as concluded for those alternatives. Because impacts would not be significant, no mitigation is proposed.

Factor 2: Sensitive Communities

ESSENTIAL FISH HABITAT (EFH) AND EELGRASS, INVERTEBRATES AND FISHES

Because this alternative would result in reduced development, including no marina, operational impacts to EFH habitat and species from marina operations (maintenance dredging) would not occur. In addition, no impacts to eelgrass would occur. Because operational impacts *would not occur*, no mitigation is proposed.

Factor 3: Wetlands

HABITATS

Based on elimination of the Yosemite Slough bridge option, the approximately 1.48 ac (0.60 ha) of "shadow fill" that would have been associated with the bridge would not occur.

4.13.8 No Action Alternative

Under the No Action Alternative, HPS would not be disposed of and would remain a closed federal property under caretaker status. Thus, these parcels would not be reused or redeveloped. Environmental cleanup would continue until completion.

4.13.8.1.1 Terrestrial Resources

Factor 1: Habitat Modification

FEDERALLY LISTED THREATENED AND ENDANGERED PLANTS AND WILDLIFE

Because HPS would not be disposed of and would remain a closed federal property under caretaker status, *no impacts* would occur to federally-listed threatened and endangered plants and wildlife.

Factor 2: Sensitive Communities

VEGETATION COMMUNITIES, HABITATS, AND COMMON WILDLIFE

Under the No Action Alternative, HPS would remain a closed federal property under caretaker status and additional adverse effects from increased human disturbance and other operational factors following cleanup would not occur to regionally abundant species. However, habitat enhancements would also not occur that include: control of non-native invasive species, restoration of grasslands, planting of native vegetation to increase tree/shrub cover, maintenance of habitat connectivity, maintenance of refugia for water birds, and provision of nest boxes in areas that are currently highly degraded or disturbed. Under the No Action Alternative, *no adverse impacts* would occur to terrestrial vegetation communities, habitats, and common wildlife.

Factor 3: Wetlands

SEASONAL FRESHWATER WETLANDS

Under the No Action Alternative, HPS would remain a closed federal property under caretaker status and *no impacts* would occur to seasonal freshwater wetlands.

4.13.8.1.2 Marine and Aquatic Resources

No impacts to marine and aquatic resources such as invertebrates and fishes would occur as a result of the No Action Alternative.

4.13.9 Mitigation

Table 4.13.9-1 describes the mitigation measures proposed to reduce potentially significant impacts associated with the proposed action and alternatives and the significance of the impact after mitigation.

Table 4.13.9-1. Mitigations for Potential Significant Impacts for the Proposed Action and Alternatives

Significance Factor	*Mitigation Measures*						
	Alternative 1 (Stadium Plan Alternative)	*Alternative 1A (Stadium Plan/No-Bridge Alternative)*	*Alternative 2 (Non-Stadium Plan/Additional R&D Alternative)*	*Alternative 2A (Non-Stadium Plan/Housing and R&D Alternative)*	*Alternative 3 (Non-Stadium Plan/Additional Housing Alternative)*	*Alternative 4 (Non-Stadium Plan/Reduced Development Alternative)*	*No Action Alternative*
Terrestrial Resources							
Factor 2: Sensitive Communities	***Mitigation 1:*** Pre-construction surveys to reduce impacts to birds and bats. ***Residual Impact After Mitigation:*** Not significant.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts are expected and no mitigation proposed.
Factor 3: Wetlands (Seasonal Freshwater Wetlands)	***Mitigation 2:*** Permanent impacts to wetlands would be mitigated based on a minimum 1:1 ratio (at least 1 ac of mitigation for every 1 ac of wetlands permanently filled) with final agency determinations occurring at the permitting stage. ***Residual Impact After Mitigation:*** Not significant.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts are expected and no mitigation proposed.
Marine and Aquatic Resources							
Factor 2: Sensitive Communities	***Mitigation 2 (see above) and Mitigation 3:*** Seasonal restrictions on in-water work. In-water work would be avoided when EFH species such as juvenile salmonids are moving through the estuary on the way to the ocean or when groundfish and prey species could be directly impacted. ***Residual Impact After Mitigation:*** Not significant.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts are expected and no mitigation proposed.
Factor 3: Wetlands	***Mitigation 2:*** Would replace lost wetlands so that wetland impacts would not be significant. ***Residual Impact After Mitigation:*** Not significant.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1.	No significant impacts are expected and no mitigation proposed.