Yerba Buena Island Ramps Improvement Project

SAN FRANCISCO COUNTY, CALIFORNIA
DISTRICT 4 – SF – 80 (KP 12.3/13.2, PM 7.6/8.1)
EA-04-3A640K

VOLUME I

Draft Environmental Impact Report/Environmental Impact Statement and Draft Section 4(f) Evaluation to Appendix G

Prepared for the
State of California Department of Transportation
and San Francisco County Transportation Authority

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.

February 2011

General Information About This Document

What's in this document:

This Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) and Draft Section 4(f) Evaluation, which examines the potential environmental effects of the alternatives being considered for the proposed project located in San Francisco County, California, has been prepared for the California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), and the San Francisco County Transportation Authority (SFCTA). The document describes why the project is being proposed; alternatives for the project; the existing environment that could be affected by the project; the potential effects from each of the alternatives; and the proposed avoidance, minimization, and/or mitigation measures.

What you should do:

Please read this Draft EIR/EIS and Draft Section 4(f) Evaluation. Additional copies of this document as well as the technical studies are available for review at Caltrans District 4 Office, 111 Grand Avenue, Oakland, CA 94612.

Attend public hearing: March 16, 2011 at the Port of San Francisco office, in the Bayside Conference Room located at Pier 1, The Embarcadero, San Francisco, CA 94111 from 6:00 to 8:00 p.m.

We welcome your comments. If you have any comments regarding the proposed project, please attend the public hearing and/or send your written comments to Caltrans via regular mail to: **Melanie Brent, Caltrans District 4 Office of Environmental Analysis, 111 Grand Avenue, Oakland, CA 94623**; (510) 286-5231, via email: melanie_brent@dot.ca.gov with a copy sent to **Eric Cordoba, Project Manager, San Francisco County Transportation Authority; 100 Van Ness Avenue, 26th Floor, San Francisco, CA 94102;** (415) 955-2904, via email: eric@cordobaconsulting.com.

Submit comments by the deadline: April 11, 2011

What happens next:

After comments are received from the public and reviewing agencies, Caltrans, as assigned by FHWA, may (1) respond to comments and give environmental approval to the proposed project, (2) undertake additional environmental studies, or (3) abandon the project. If the project is given environmental approval and funding is appropriated, Caltrans could design and construct all or part of the project.

For individuals with sensory disabilities, this document can be made available in Braille, large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Department of Transportation, Attn: Charles Wahnon, ADA/Section 5041 Disability Program, 1120 N Street, Sacramento, CA 94273-0001; (916) 324-1353 Voice, or use the California Relay Service (800) 735-2929 (TTY), (800) 735-2929 (Voice) or 711.

SCH#2008092019
04-SF-80-KP 12.3/13.2 (PM 7.6/8.1)
EA: 3A640K

Yerba Buena Island Ramps Improvement Project

DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT and DRAFT SECTION 4(f) EVALUATION

Submitted Pursuant to:

California Environmental Quality Act, Division 13, California Public Resources Code and the National Environmental Policy Act 42 U.S.C. 4332(2)(C), and 49 U.S.C. 303

By the

SAN FRANCISCO COUNTY TRANSPORTATION AUTHORITY

and

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

and the Cooperating Agency

UNITED STATES COAST GUARD

2/11/11
Date of Approval

Jose Luis Moscovich
Executive Director
San Francisco County Transportation Authority

02/11/11
Date of Approval

Bijan Sartipi
District Director, District 4
California Department of Transportation

Capt. P. M. McMillin
U. S. Coast Guard
Chief, Product Line Division
By Direction of the Commander

The following persons may be contacted for additional information concerning this document:

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Abstract: The San Francisco County Transportation Authority and the California Department of Transportation propose to replace the existing westbound on- and off-ramps located on the east side of Yerba Buena Island with new westbound on- and off-ramps. The purpose of the project is to improve the traffic safety, geometric configuration, and operations of the ramps. Proposed alternatives include the No Build Alternative and two build alternatives that would replace the existing ramps. Potential project impacts include the removal of historic structures, existing vegetation, visual impacts, hazardous wastes, and temporary noise and traffic impacts associated with construction activities. However, with implementation of proper mitigation measures, most of these impacts would be reduced or eliminated.

Comments on this document are due by April 6, 2011, and should be sent to Melanie Brent with a copy sent to Eric Cordoba at the above addresses.

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SUMMARY

The San Francisco County Transportation Authority (SFCTA) and the California Department of Transportation (Caltrans) are proposing to improve the traffic safety of the westbound on- and off-ramps located on the east side of Yerba Buena Island (YBI). The SFCTA is the lead agency under the California Environmental Quality Act (CEQA) and Caltrans is the lead agency under the National Environmental Policy Act (NEPA). In cooperation with Caltrans, the SFCTA has prepared this Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) pursuant to the NEPA and CEQA for the proposed YBI Ramps Improvement Project.

Overview of Project Area

Yerba Buena Island (YBI) is located in the San Francisco Bay, approximately halfway between Oakland and San Francisco, and is accessible by vehicles only via the San Francisco-Oakland Bay Bridge (SFOBB), which is part of Interstate 80 (I-80). The SFOBB is a critical link in the interstate network, providing access between San Francisco and the East Bay. YBI and the SFOBB also provide access to Treasure Island (TI), which lies to the north of YBI. YBI and TI are accessed by on-and off-ramps located on the upper and lower decks of the SFOBB. The SFOBB and the associated on- and off-ramps provide the only land access to the active USCG facilities located on the southern side of YBI.

The proposed project would replace the existing westbound on-ramp and the westbound off-ramp located on the eastern side of YBI with a new westbound on-ramp and a new westbound off-ramp that would improve the functional roles of the current ramps.

Build alternatives have been proposed to address the geometric and operational deficiencies of the existing on- and off-ramps and their effects on the SFOBB (I-80) mainline without degrading the mainline operation as compared to no action. This YBI Ramps Improvement Project is separate and independent of the SFOBB East Span Seismic Safety Project (ESSSP), which is currently under construction. Of the six ramps on YBI, the ESSSP will replace the eastbound on- and off ramps on the east side of YBI. The proposed new westbound ramps would improve operations and provide connections between YBI and the transition structure of the new SFOBB. The proposed project is located between Kilometer Post (KP) 12.3 and 13.2, Post Mile (PM) 7.6 and PM 8.1 starting at the east portal of the YBI tunnel and ending before the SFOBB Transition Structure.

Purpose and Need

The purpose of the proposed project is to improve:

- Traffic safety for drivers using the westbound on- and off-ramps
- Geometric design of the westbound on- and off-ramps on the east side of YBI to and from I-80
- Traffic operation levels of service (LOS) on the westbound on- and off-ramps.

The proposed project is needed for the reasons listed below and explained in subsequent paragraphs:

- **Safety:** The accident rate for the on- and off-ramps is higher than the statewide rate for similar facilities.
- **Geometric Design:** The westbound on-ramp merge lengths and off-ramp deceleration lengths on the east side of YBI do not meet current Caltrans standards.
- **Operations:** Projections of 2035 traffic volumes indicate ramp operations at a failing LOS F on both the on- and off-ramps in both the morning and evening peak hours.

Safety: The accident rate for the existing on- and off-ramps is higher than the statewide rate for similar facilities. The accident rate based on data collected over a 3-year period between April 1, 2003 and March 31, 2006 on YBI exceeded the statewide average rate (per million vehicle miles) for total collisions (sum of fatalities, injuries, and property damage) (TASAS Selective Accident Retrieval, Table B).[1] This 3-year period is the latest data available for the existing on- and off-ramps because these ramps have been closed for the construction of the SFOBB ESSSP project. The Actual Accident Rate for the existing westbound on-ramp is 0.75 per million vehicle miles compared to a rate of 0.60 for similar facilities statewide. For the existing westbound off-ramp, the accident rate is 1.4 rate per million vehicle miles compared to a 1.15 for similar facilities statewide. The distance available for westbound on-ramp traffic to merge with mainline traffic is very short and results in abrupt maneuvers of westbound on-ramp and mainline traffic. These factors affect the traffic operations of the facilities and motorists traveling on the freeway mainline and on-ramp. The proposed ramps have been designed to accommodate future traffic operations for the 20-year design horizon as required by Caltrans standards HDM Section 103.2. This would improve the LOS and is anticipated to decrease the accident rate potential. In particular, the potential for rear end collisions on the westbound on-ramp are expected to decrease under the proposed project, which has been the predominant type of accident that has occurred in the past.

Geometric Design: The existing westbound on-ramp merge lengths and off-ramp deceleration lengths on the east side of YBI do not meet current Caltrans standards. The existing westbound on-ramp on the east side of YBI has a very short merge distance of approximately 43 meters (141 feet) which calculates to a 1:11 transition rate. It has a steep entrance grade of approximately 10 percent leading to a 122-meter (400 feet) long crest vertical curve, resulting in a 30 km/h (18.6 mph) design speed. Therefore, traffic cannot accelerate to a proper mainline speed of 80 km/h (50 mph) to merge with through traffic. The existing westbound off-ramp diverges from the left-side freeway lane. The left-side exit lane is nonstandard (Highway Design Manual Section 504.2) and is signed for 48 km/h (20 mph). Its geometry includes a short deceleration length and sharp curve upon exiting the mainline, and presents challenges for motorists and large vehicles to maneuver. The proposed ramps would meet Caltrans standards by providing standard

[1] TASAS Table B reports for accident data calculations are available for any highway or section of highway, any or all ramps, any or all intersections for any time period specified. The report shows both actual and average rates. The report also shows total accidents, fatalities, injuries, multi-vehicles, wet, dark, persons killed and injured and the significance. Table B was generated for all six ramps on YBI and included in the Draft Project Report (DPR) prepared for this project.

lane and shoulder widths and other geometric features such as the divergence angle, acceleration length, and turning radius that would improve the LOS and safety of the ramp. LOS is a qualitative description of a ramp segment or intersection performance based on the criteria outlined in the Highway Capacity Manual (HCM). LOS ranges from A, which indicates free flow or excellent conditions with short delays, to F, which indicates congested or overloaded conditions with extremely long delays. Caltrans criteria are used to establish a goal of LOS C, when possible.

Operations: The existing westbound off-ramp diverges from the left lane of I-80. This left-lane exit requires exiting vehicles to travel in and across the “fast” lanes to exit the freeway. These maneuvers negatively affect the flow of mainline traffic. The distance available for westbound on-ramp traffic to merge with mainline traffic is very short and results in abrupt maneuvers of westbound on-ramp and mainline traffic. Projections of 2035 traffic volumes indicate ramp operations at a failing LOS F on both the on- and off-ramps in both the morning and evening peak hours. Currently, the westbound left-lane off-ramp operates at LOS D in the morning peak hour and at LOS C in the evening peak hour. The existing westbound, on-ramp operates at LOS D in both the morning and the evening peak hours. In the future (2035) no build condition, both the westbound off-ramp and on-ramp would operate at LOS F in both the morning and the evening peak hours. Under the 2035 build condition without ramp meters for, the westbound off-ramp would operate at LOS F in both peak hours, and the westbound on-ramp would operate at LOS F in the morning peak hour and LOS E in the evening peak hour. In the 2035 build condition with ramp meters, the proposed westbound on-ramp would operate at LOS C in both peak hours. The proposed westbound off-ramp without meters would operate at LOS E in both peak hours.

Related Plans and Projects

In addition to the proposed YBI Ramps Improvement Project, other plans and projects on the islands are also underway. These include the TI/YBI Redevelopment Project, the San Francisco Bicycle Plan, the West Span Bay Bridge Bicycle and Pedestrian Pathway, and the SFOBB ESSSP.

The Treasure Island Development Authority and the San Francisco Board of Supervisors endorsed the Development Plan and Term Sheet for the Redevelopment of Former Naval Station Treasure Island in December 2006. The proposed TI/YBI Redevelopment Project is currently undergoing its own environmental review process under CEQA and redevelopment plan adoption process under the California Community Redevelopment Law.

The San Francisco Bicycle Plan was adopted in June 2009. The plan includes updated goals and objectives to encourage bicycle use in the city, describes the existing bicycle route network, and identifies improvements to achieve the plan’s goals and objectives. The future bikeway path planned for the perimeter of Treasure Island would fall under the same footprint as the TI/YBI Redevelopment Project.

California Senate Bill 1061 (Hancock), “San Francisco-Oakland Bay Bridge: capital projects” was passed by the state Assembly Committee on Transportation on June 22, 2010. This bill would allow a portion of Bay Bridge toll funds to be spent on the West Span Bay Bridge Bicycle and Pedestrian Pathway, connecting YBI to San Francisco.

The Final EIS for the SFOBB ESSSP was approved in April 2001 and the Federal Highway Administration (FHWA) and Caltrans selected the preferred alternative in July of that year. Construction of the project began in January 2002 and is ongoing.

USCG Sector San Francisco is an active military installation and as such various facility and operational projects are underway at any given time. These activities are ongoing 24 hours a day, 7 days a week, 365 days a year (365/24/7).

Proposed Action

Typically the environmental process includes a range of reasonable build alternatives. A No Build Alternative represents the existing condition. All other alternatives are compared to the No Build. For this document, alternatives advanced for further study included the No Build Alternative and two build alternatives. Alternatives were selected based on the purpose and need for this project—to increase traffic safety and to improve geometric and operations of the westbound on- and off-ramps. The No Build Alternative, Alternative 2b, and Alternative 4 are described below.

No Build (No Action) Alternative

With the exception of the eastbound on- and off-ramps, which are part of the SFOBB East Span Seismic Safety Project, the No Build Alternative assumes that the existing westbound on- and off-ramps would remain in place and no further action or improvements would occur.

Alternative 2b

Alternative 2b includes removal of the existing westbound on- and off-ramps on the east side of YBI, construction of a westbound hook on-ramp from Macalla Road on the east side of YBI, and construction of a westbound off-ramp to Macalla Road on the east side of YBI.

This alternative proposes to reconstruct two of the existing six on- and off-ramps at the I-80/YBI interchange. The proposed on- and off-ramps would provide standard lane and shoulder widths, and would include the following features:

- Westbound on-ramp on the east side of YBI. This ramp would begin at a “T” intersection at Macalla Road, loop right with a tight radius, and merge on to the north side of the Bay Bridge. The length of this ramp would be approximately 267 meters (867 feet). This ramp would have two traffic lanes, merging into one as it connects to the SFOBB. One lane would be a high occupancy vehicle (HOV) lane[2] and the other a mixed-flow[3] lane.

- Westbound off-ramp on the east side of YBI. This ramp would diverge from the new SFOBB Transition Structure between bents W3 and W4 and terminate at a “T” intersection at Macalla Road. The length of this ramp would be approximately 340 meters (1,115 feet). A stop sign is proposed at the ramp terminus.

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[2] Under the Treasure Island Transportation Management Act (Assembly Bill 981, signed into law in September 2008), high occupancy vehicles would be able to exit or enter Treasure Island free of charge.

[2] A mixed-flow lane is a general purpose travel lane with no traffic restrictions.

- Macalla Road would be widened for approximately 202 meters (662 feet) adjacent to the terminus of the westbound on- and off-ramps. The existing roadway is about 6 meters (20 feet) wide near the ramp terminus. The roadway widening is required to accommodate a future 3.7-meter (12 feet) wide multi-use pedestrian/bike path and two 3.7-meter (12 feet) wide lanes within the Caltrans right-of-way. A retaining wall would be constructed adjacent to Macalla Road to provide the required width. The height of the retaining wall would vary from 1.2 to 4.9 meters (4 to 16 feet) and would retain the hillside above Macalla Road. The stairway adjacent to the Caltrans substation would be relocated to the west side of the building to make room for the new retaining wall. The roadway width would vary around the curve at South Gate Road to provide proper width for truck turning movements.

- The westbound on- and off-ramps would terminate at Macalla Road where Quarters 10/Building 267 are currently located, requiring their removal.

Alternative 4

Alternative 4 includes the removal of the existing westbound on- and off-ramps on the east side of YBI, construction of the westbound on-ramp from South Gate Road, and construction of the westbound off-ramp to Macalla Road on the east side of YBI.

This alternative proposes to reconstruct two of the existing six on- and off-ramps at the I-80/YBI interchange. The proposed on- and off-ramps would provide a standard lane with standard shoulder widths and would include the following features:

- Westbound on-ramp on the east side of YBI. This ramp would begin at South Gate Road, proceed east paralleling the eastbound on-ramp, loop under the new SFOBB Transition Structure near its eastern end to provide adequate merging distances, and cross over the westbound off-ramp along the north side of the Bay Bridge. The length of this ramp would be approximately 879 meters (2,883.8 feet). An HOV lane would not be provided.

- Westbound off-ramp on the east side of YBI. This ramp would diverge from the new SFOBB Transition Structure between bents W2 and W3, parallel the Transition Structure, cross under the westbound on-ramp, and terminate at a “T” intersection at North Gate Road. The length of this ramp would be approximately 356 meters (1,168 feet). A stop sign is proposed at the ramp terminus. An HOV lane would not be provided.

- Pavement reconstruction on Macalla Road and South Gate Road at the ramp intersections is proposed to ensure a proper pavement conform and truck turning movements.

- Quarters 10/Building 267 and associated landscaping would remain in place.

Identification of the Preferred Alternative

After the Draft EIR/EIS public circulation and review period, all comments will be considered, and the SFCTA and Caltrans will identify a preferred alternative. The preferred alternative will be identified in the final environmental document. In accordance with CEQA, the SFCTA would certify that the project complies with CEQA, prepare findings for all significant impacts identified, prepare a Statement of Overriding Considerations for impacts that would not be mitigated below a level of significance, and certify that the findings and Statement of Overriding Considerations have been considered prior to project approval. If the SFCTA approves the project, it would then file a Notice of Determination (NOD) with the State Clearinghouse that would identify whether the project would have significant impacts, whether mitigation measures were included as conditions of project approval, whether findings were made, and whether a Statement of Overriding Considerations was adopted. With respect to NEPA, Caltrans, as assigned by FHWA, would document and explain its decision regarding the selected alternative, project impacts, and mitigation measures in a Record of Decision (ROD) in accordance with NEPA. If the selected alternative is a build alternative, the selected alternative would advance to the design and permitting stage. Based on available funding, permitting and construction could begin as early as 2012.

Joint CEQA/NEPA Document

The proposed project is subject to Federal and state environmental review requirements since the SFCTA proposes the use of Federal funds from the FHWA and/or the project requires a FHWA approval action. Project documentation, therefore, has been prepared in compliance with both CEQA and NEPA. The SFCTA is the project sponsor and lead agency under CEQA. FHWA's responsibility for environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to Section 6005 of SAFETEA-LU codified at 23 United States Code (U.S.C) 327(a)(2)(A). Effective July 1, 2007, FHWA has assigned, and Caltrans has assumed, all the USDOT Secretary's responsibilities under NEPA. The assignment applies to all projects on the State Highway System (SHS) and all Local Assistance Projects off the SHS within the State of California, with the exception of the responsibilities concerning certain categorical exclusions, which were assigned to Caltrans under the June 7, 2007 MOU, projects excluded by definition and specific project exclusions. Refer to Chapter 38 of the SER for more information.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or some lower level of documentation such as an EA, will be required. NEPA requires that an EIS be prepared when the proposed Federal action (project) as a whole has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require the lead agency to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA.

Following receipt of public comments on the Draft EIR/EIS and circulation of the Final EIR/EIS, the lead agencies will be required to take actions regarding the environmental document. The SFCTA will determine whether to certify the EIR and issue Findings and a Statement of Overriding Considerations. If the decision is made to approve the project, an NOD will be published for compliance with CEQA. Caltrans will issue a ROD for compliance with NEPA following circulation of the Final EIR/EIS.

Project Partners

A number of agencies are participating in the YBI Ramps Improvement Project environmental process. These agencies and their roles are discussed below.

Federal Lead Agency

A NEPA document is required for most Federal actions. A Federal action can include funding a project, building a project on Federal land, or issuing a Federal permit. The Federal agency that takes this action is typically the lead NEPA agency. A lead agency is the agency with the main responsibility for complying with Federal environmental regulations. For the YBI Ramps Improvement Project, Caltrans, under its assumption of responsibility pursuant to 23 U.S.C. 327, is the lead Federal agency for the purposes of NEPA.

State Lead Agency

Similar to NEPA regulations, CEQA requires that a state, regional, or local agency take responsibility for complying with state environmental regulations if a governmental (state, regional, or local) action is being taken. The lead CEQA agency for the YBI Ramps Improvement Project is the SFCTA.

Project Impacts

Major project impacts that would require avoidance, minimization, and/or mitigation measures as a result of the proposed YBI Ramps Improvement would occur for Traffic and Transportation/Pedestrian and Bicycle Facilities, Visual/Aesthetics, Cultural Resources, Geology/Soils/Seismic/Topography, Paleontological Resources, Hazardous Waste/Materials, Air Quality, Noise, and Biological Environment. A summary of the measures is included in Table S-1 below.

Table S-1: Project Impacts

Resource Area	Avoidance, Minimization, and/or Mitigation Measures
Traffic and Transportation/Pedestrian and Bicycle Facilities	Construction activities would result in temporary detours and single-lane closures. These impacts would be minimized through coordination with the USCG and emergency service providers. Efforts would be made to concentrate the majority of road closures and construction activity during off-peak hours to reduce traffic impacts. Traffic would be diverted to one side of the road and traffic would be controlled by flaggers stationed at both ends of the closure. Similar traffic handling is currently being used on Macalla Road with the ongoing SFOBB construction by Caltrans. Macalla Road primarily serves the USCG facility. After construction, ramp metering will be in effect, which may cause long delays and queues are expected on the approaches to the on-ramp. With ramp metering, the metering rates can be coordinated such that the number of vehicles entering the mainline would be based on the number of vehicles exiting the mainline. Additionally, the mainline metering lights for westbound traffic (just west of the toll booths) could be coordinated with the on-ramp, such that the traffic entering the SFOBB could be reduced while the metering rate for the on-ramp is increased, and vice versa.
Visual/Aesthetics	Construction of the build alternatives would in some cases have significant impacts on the visual quality of some areas when these areas are observed from certain viewpoints. This would be noticeable in cases where views toward or from the Senior Officers' Quarters Historic District would be dominated and/or obstructed by the ramp structures. A landscaping plan for the project area would be developed in cooperation with the District Landscape Architect. The landscaping plan would incorporate the use of native plants, and would be implemented in a manner that is consistent with the Treasure Island/Yerba Buena Island Redevelopment Plan. The landscaping plan would be in compliance with the invasive species provisions outlined in the Biological Resources section of this EIR/EIS.
Cultural Resources	An archaeology monitoring plan would be developed and implemented to outline the avoidance and protection measures that would be taken to protect the known archaeological site (CA-SFR-04/H) (Alt 4 only) and to address the potential for discovery of unknown archaeological resources. Other mitigation measures proposed under the MOA, which may apply to either alternative as appropriate, includes vibration studies, preparation of Historic Structure Reports (HSRs), stabilization/monitoring/security during construction, interpretation of historic properties, relocation of Quarters 10/Building 267 (Alt 2b only), cultural landscape monitoring and protection measures, rehabilitation of Quarters 10/Building 267, rehabilitation and/or restoration of cultural landscape features, and post-construction conditions assessment and reevaluation.
Geology/Soils/Seismicity/Topography	Caltrans would retain California-licensed geologists and geotechnical engineers to assist in final design and review of the final construction plans and specifications to confirm inclusion of recommendations from the Foundation Report. Caltrans would document compliance with this measure prior to the final project design. The geotechnical engineer would conduct inspections and testing during the stages of construction.

Resource Area	Avoidance, Minimization, and/or Mitigation Measures
Paleontology	Caltrans would retain a qualified principal paleontologist (MS or PhD in paleontology or geology familiar with paleontological procedures and techniques). The paleontologist would review the selected alternative alignment and design, once a preferred project alternative is identified; develop a Paleontological Mitigation Plan (PMP); determine the potential for discovery of significant fossils; and identify specific avoidance, minimization, and/or mitigation measures as needed. In addition, onsite training and monitoring of project-related, ground-disturbing activities within the Franciscan Complex and Colma formation should occur.
Hazardous Waste/Materials	Determination of specific construction activities planned on or near a potential contaminant source would occur once a preferred project alternative is identified. Additional site-specific delineation of any remaining areas of unabated contamination would be performed to finalize details of construction, to detail procedures for handling of contaminated media, and to ensure worker safety during construction.
Air Quality	The contractor would be required to implement these “Basic Control Measures” during all construction activities. The abatement measures listed in the Yerba Buena Island Ramps Improvement Project Air Quality Analysis (Appendix L) are also required to be implemented during construction activities. In addition, the project site is approximately 1.62 hectares (4 acres); therefore, according to the BAAQMD CEQA Guidelines, the contractor is required to implement the BAAQMD’s “Enhanced Control Measures.”
Noise	Construction noise abatement would be implemented as required by the Caltrans’ Standard Specification 14-8.02, “Noise Control”
Biological Environment	Prior to the onset of construction activities, a qualified biologist would conduct focused surveys for animal species, threatened and endangered species identified in Chapter 3.17 – Biological Environment. In addition, all avoidance, minimization, and compensatory measures outlined in Chapter 3.17 and/or included in permits and regulatory concurrence letters would be implemented.

Coordination with Public and Other Agencies

In accordance with 23 Code of Federal Regulations (C.F.R.) 771.105(a) and 771.133 and with CEQA and the implementing regulations, Caltrans and the SFCTA will comply with all applicable Federal and state environmental laws, regulations, and Federal executive orders applicable to the proposed project during the environmental review process. These requirements may include, but are not limited to, the regulations of the Council on Environmental Quality and Caltrans implementing NEPA (40 C.F.R. parts 1500–1508, and 23 C.F.R. Part 771); Caltrans, under its assumption of responsibility pursuant to Section 6005 of SAFETEA-LU codified at 23 U.S.C. 327(a)(2)(A), is the lead Federal agency for the purposes of NEPA; the project-level air quality conformity regulation of the U.S. Environmental Protection Agency (USEPA) (40 C.F.R. part 93); the Section 404(b)(1) guidelines of USEPA (40 C.F.R. part 230); the regulation implementing Section 106 of the National Historic Preservation Act (36 C.F.R. Part 800); the regulation implementing Section 7 of the Endangered Species Act (50 C.F.R. part 402); Section 4(f) of the 1966 Department of Transportation Act (23 C.F.R. 771.135; 49 U.S.C. 303); Section 401 and 404 of the Clean Water Act; Section 10 U.S. Army Corps of Engineers; USCG Section 9 permit requirements, determination of consistency with the Federal Coastal Zone Management Act by the San Francisco Bay Conservation and Development Commission; Federal Executive Orders 12898 on environmental justice, 11988 on floodplain management, and 11990 on wetlands; and the CEQA laws and regulations. The SFCTA Board would certify the EIR. Caltrans would select a Preferred Alternative and issue a ROD following circulation of the Final EIR/EIS, approve the project and project design, and would be responsible for project construction.

In September 2008, Caltrans prepared a SAFETEA-LU Coordination Plan for the project and invited agencies to become participating or cooperating agencies during the NEPA environmental review process. This plan is required by Section 6002 of SAFETEA-LU, which is codified in 23 U.S.C. Sec. 139. Letters inviting agencies to become participating or cooperating agencies were sent out on September 5, 2008. The U.S. Coast Guard (USCG), U.S. Environmental Protection Agency (USEPA), U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), San Francisco Regional Water Quality Control Board (SFRWQCB), Treasure Island Development Authority (TIDA), and San Francisco Municipal Transportation Agency (SFMTA) accepted the invitation to participate. Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, state, participating agencies (including federally recognized tribal governments, if any), and local agencies, and to private organizations and citizens who have previously expressed or are known to have interest in this proposal.

In November 2010, Caltrans contacted and sent out an invitation to agencies and local interest groups for an opportunity to hear an update on the project alternatives and potential environmental impacts, which was held on December 7, 2010.

To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties.

(1) List of Permits and Approvals Needed

Collaborative efforts have taken place throughout the planning process with key agency representatives from as early as 2002 when the initial conceptual alternatives were presented until recently when the alternatives were further refined. Coordination on potential key environmental issues has occurred, including Section 4(f) historic properties with SHPO, and waters of the U.S. with USACE. On-going coordination has occurred with the CCSF, TIDA and the USCG to ensure construction and operation of the project would not conflict with existing use and future plans.

Permit and consistency determinations that are anticipated to be required for project implementation are listed below in Table S-2.

Table S-2: Permits and Approvals Needed

Approval Agency	Permit/Approval/Determination	Status
BCDC	Consistency Determination	Anticipate After ROD
SHPO	Section 106 concurrence and MOA	Anticipate between Draft and Final
Regional Water Quality Control Board	NPDES Statewide Permit (Order No. 99-06-DWQ) Dewatering permit (R2-2007-0033) 401 Water Quality Certification Permit	After ROD After ROD After ROD
Air Pollution Control District	Permit to Construct	After ROD
USACE	404 Nationwide Permit (NWP 14)	Pre-construction notification
USCG	Section 9 Permit Requirements MOU to ensure existing MOA and license criteria currently in effect with the SFOBB ESSSP will apply to the YBI Ramps Improvement Project Encroachment Permit	After ROD Anticipate between Draft and Final EIR/EIS After ROD
MTC	Air Quality $PM_{2.5}$	Anticipate between Draft and Final

(2) Unresolved Issues

No unresolved issues have been identified for this project.

(3) Areas of Controversy

The NEPA Notice of Intent (NOI) and CEQA Notice of Preparation (NOP) were published on September 5, 2008, announcing the intent to prepare and distribute an EIR/EIS. Based on public comments on the NOI/NOP, the following areas were carefully analyzed to address potential controversy related to the project:

- Air Quality;
- Historic and cultural resources;
- Water quality;
- Biological resources;
- Traffic and transportation; and
- Bicycle and pedestrian access.

Environmental Process

This Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) evaluates the environmental effects of the proposed project and when warranted, identifies mitigation measures to reduce project effects.

After publishing and circulating this Draft EIR/EIS for public review and comment, the lead agencies will follow typical CEQA/NEPA procedures and :

- conduct a public hearing on this Draft EIR/EIS (date);
- provide a public comment period where interested parties can submit written comments on this Draft EIR/EIS (date);
- identify a Preferred Alternative;
- prepare and distribute a Final EIR/EIS. The Final EIR/EIS will include responses to comments received on the Draft EIR/EIS; and
- approve a project, select a Preferred Alternative, and issue a CEQA NOD and a NEPA ROD. The ROD will allow the lead agencies to move forward with final design and permitting.

Alternatives Considered

Alternatives under consideration for the EIR/EIS include:

(1) No Build Alternative, which assumes that the existing on- and off-ramps would remain in place and no further action or improvements would occur;

(2) Alternative 2b, which would include removal of the existing westbound on- and off-ramps on the east side of YBI, construction of a westbound loop on-ramp from Macalla Road on the east side of YBI, and construction of a westbound off-ramp to Macalla Road on the east side of YBI.

(3) Alternative 4, which would include the removal of the existing westbound on- and off-ramps on the east side of YBI, construction of the westbound on-ramp from South Gate Road, and construction of the westbound off-ramp to Macalla Road on the east side of YBI.

Throughout the planning process several avoidance configurations were explored in order to attempt to avoid Section 4(f) resources, consisting of listed historic properties in close proximity to the ramp project locations. Alternative 6 was developed in an attempt to avoid the three known resources, the Senior Officers' Historic District, the Quarters 1/Nimitz House and Quarters 10 (including building 267).

Please refer to Chapter 2.0, Alternatives, for a description of nonviable build alternatives, including Alternative 6 which was an alternative to avoid 4(f) properties, and Appendix B, Section 4(f), for further information.

Project Costs

The estimated total costs for each of the alternatives have been developed. The No Build Alternative would have no cost. Alternative 2b would cost approximately $79 million, of which approximately $256,000 is for right-of-way acquisition, approximately $58 million is for construction, and $21 million is for engineering costs. Alternative 4 would cost approximately $159 million, of which $3.6 million is for right-of-way acquisition, $125 million is for construction, and $33.7 million is for engineering costs. The right-of-way capital costs include temporary and permanent easements from the USCG for both alternatives.

CHAPTER 1 – PROPOSED PROJECT

1.1 Introduction

The San Francisco County Transportation Authority (SFCTA) and the California Department of Transportation (Caltrans) are proposing to improve traffic safety of the westbound on- and off- ramps located on the east side of Yerba Buena Island (YBI).

The YBI Ramps, built in the early 1960s, provide access to YBI and Treasure Island (TI) for motorists traveling to and from the San Francisco-Oakland Bay Bridge (SFOBB) portion of Interstate 80 (I-80). The ramps need to be upgraded to meet current safety standards. The nonstandard features of the ramps, current accident safety records, and the projected build-out growth have increased the need to reconstruct the ramps.

The project is located along I-80 and extends 0.5 mile from the east end of the YBI Tunnel to the beginning of the self-anchored suspension (SAS) structure of the new SFOBB East Span. Figures 1-1 and 1-2 show the project location and vicinity maps.

The project is included in the Metropolitan Transportation Commission's (MTC's) 2009 Regional Transportation Plan as project reference number 230555, *Transportation 2035 Plan for the San Francisco Bay Area* available at http://www.mtc.ca.gov/planning/2035_plan/FINAL/T2035_Plan-Final.pdf (MTC 2009). The project is also included in the MTC's *2009 Transportation Improvement Program* (TIP), with a TIP identification number SF-070027 available at http://www.mtc.ca.gov/funding/tip/2009/final/Project_Listings_Final.pdf (MTC 2008).

1.2 Project Background and History

The SFOBB is a critical link in the interstate network, providing access between San Francisco and the East Bay. The SFOBB currently serves approximately 350,000 people in the 272,000 vehicles that use the bridge each day. The SFOBB and the YBI Tunnel opened to traffic in 1936 and were the world's longest vehicular bridge and the largest bore tunnel of their time.

The original SFOBB carried two-way traffic on its upper deck and provided an on-ramp and an off-ramp to YBI. These ramps are the existing westbound on- and off-ramps east of the YBI tunnel. Timber structures were built on the west side of the island in the late 1930s to add on- and off-ramps to the upper and lower decks and to provide additional access to the SFOBB from the island. In 1960, the passenger rail line on the lower deck of the SFOBB was removed and converted to eastbound traffic only and the upper deck was dedicated to westbound traffic only. In 1962, the timber ramps were removed and four additional ramps were constructed: the westbound on-ramp and eastbound off-ramp west of the YBI tunnel; and the eastbound on- and off-ramps east of the YBI tunnel.

In April 1941, during World War II, all of TI and portions of YBI, including the SFOBB on- and off-ramps, were allocated to the U.S. Navy for use as a military facility called Naval Station Treasure Island (NSTI). The USCG has also maintained a presence on YBI since 1872 though its property is separate from that of the larger NSTI. After serving as a center for receiving, training, and dispatching service personnel during World War II, NSTI was subsequently used for more than 50 years as a location for naval training and as an administrative center. In 1993, NSTI was selected for closure. In 1997, the U.S.

Not To Scale

Figure 1-1
Regional Map

Source: Google, EDAW/AECOM 2009

Figure 1-2
Vicinity Map

Navy closed its military operations on the base and transferred interim control of most of its property to the Treasure Island Development Authority (TIDA) via a cooperative agreement, with the intention of transferring all property to TIDA. In 2000 and 2004, the U.S. Government, acting through the Federal Highway Administration (FHWA), transferred to Caltrans all permanent property rights and temporary construction easements, respectively, required for both the existing SFOBB and the new East Span, including all ramps east of the YBI tunnel, including all rights required for construction of the East Span Seismic Safety Project (ESSSP). The U.S. Navy is in the process of transferring all remaining NSTI property to TIDA, including the areas required for the YBI Ramps Improvement Project. Upon completion of the YBI Ramps Improvement Project, TIDA would transfer ownership of the new YBI Ramps and associated rights-of-way and necessary easements to Caltrans, subject to approval by the California Transportation Commission.

Currently, the YBI interchange consists of six single-lane ramps: two ramps (an eastbound off-ramp and a westbound on-ramp) west of the YBI tunnel and four ramps east of the tunnel (eastbound on- and off-ramps and westbound on- and off-ramps). Figure 1-3 shows the configuration of the existing ramps.

1.3 Related Plans and Projects

1.3.1 Past and Present Projects

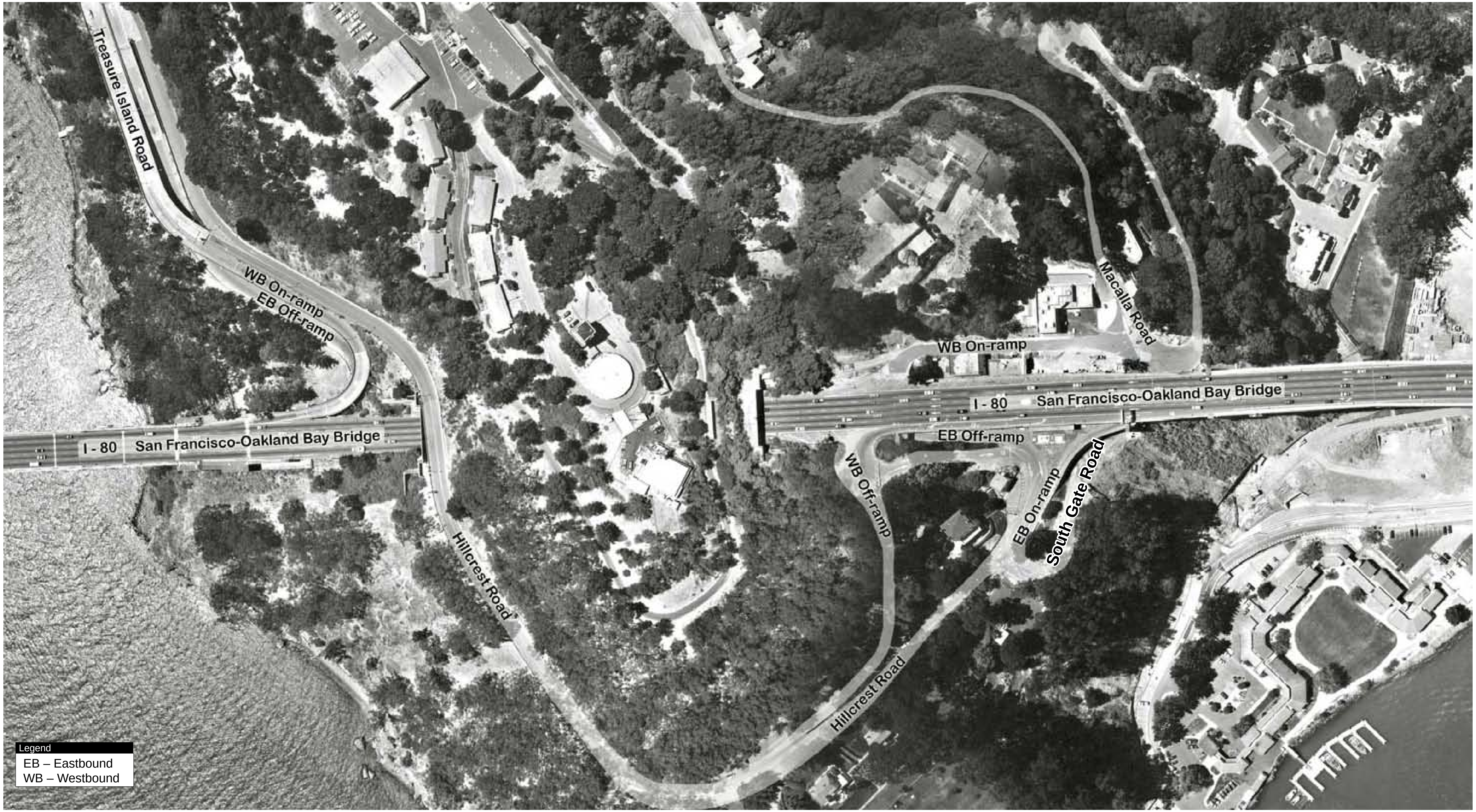
The existing East Span of the SFOBB is in the process of being replaced as part of a legislatively mandated seismic retrofit program adopted January 1, 1991, in response to the damage caused by the October 17, 1989, Loma Prieta Earthquake. The existing East Span must be replaced because it is not expected to meet the required lifeline criteria for providing emergency relief access following a magnitude 8 earthquake (Richter Scale) on the San Andreas Fault, or a magnitude 7.25 earthquake on the Hayward Fault.

The SFOBB ESSSP is composed of several segments and will be constructed via several construction contracts. The first segment is the construction of the concrete viaduct known as the Skyway. This segment began in 2002 and was completed in 2007. This structure extends across the San Francisco Bay and connects the bridge with the Oakland Touchdown structure, which ties into existing I-80.

The second segment constructed the Replacement Viaduct Structure, which was completed in 2007. The structure begins approximately 60.96 meters (200 feet) east of the entrance to the YBI tunnel. The Replacement Viaduct Structure provides a link between the YBI tunnel and a temporary traffic bypass structure. At project completion, this structure will provide the connection between the YBI tunnel and the YBI Transition Structures (YBITS).

The third segment constructed the temporary structure known as the Temporary Bypass Structure and was completed 2009. This structure provides traffic bypass during the construction of the YBITS.

The fourth segment will construct the SAS bridge, which will be erected over the navigational channel immediately east of YBI. This SAS bridge connects the YBITS to the Skyway structure.



Source: AECOM Transportation 2007

Figure 1-3
Existing Ramp Layout

The fifth segment will construct the YBITS. The construction of the YBITS is divided into two phases. YBITS 1 will construct the mainline structure, which will transition traffic from the existing double deck configuration of the YBI tunnel to the new side-by-side, single deck configuration of the proposed East Span of the SFOBB. The construction of YBITS 1 is scheduled to start in early 2010. YBITS 2 will construct the eastbound on- and off-ramps and is scheduled to start in late 2012.

1.3.2 Reasonably Forseeable Projects

In addition to the SFOBB ESSSP that is currently under construction, an additional planning effort for future development on TI and YBI is in progress. This includes proposed plans for the Treasure Island and Yerba Buena Island (TI/YBI) Redevelopment Project, which is currently undergoing its own environmental review process under the California Environmental Quality Act (CEQA) and redevelopment plan adoption process under California Community Redevelopment Law. The YBI Ramps Improvement Project is separate and independent of both the SFOBB ESSSP and TI/YBI Redevelopment Project. The reasonably forseeable projects were included in the land use analysis and cumulative impact assessment for the project.

On the USCG property, a new command center will be completed in 2011. The Vessel Traffic Service (VTS) personnel currently at the top of YBI would move downhill to occupy space in the new building. The USCG would reuse the existing spaces vacated by VTS at the top of YBI. In the long term, an approved problem statement (PS) is in place to relocate 70 personnel from Sector San Francisco’s Prevention Department from the USCG Island to new facilities on YBI.

The San Francisco Bicycle Plan was adopted in June 2009. The plan includes updated goals and objectives to encourage bicycle use in the City, describes the existing bicycle route network, and identifies improvements to achieve the plan’s goals and objectives. The bikeway path planned for the perimeter of Treasure Island would fall under the same footprint as the TI/YBI Redevelopment Project.

California Senate Bill 1061 (Hancock), “San Francisco-Oakland Bay Bridge: capital projects” was passed by the state Assembly Committee on Transportation on June 22, 2010. This bill would allow a portion of Bay Bridge toll funds to be spent on the West Span Bay Bridge Bicycle and Pedestrian Pathway, connecting YBI to San Francisco.

Figure 1-4 illustrates the location and potential influence of these related plans and projects on the YBI Ramps Improvement Project.

1.4 Environmental and Engineering Analysis

This environmental document has been initiated as the next step in the progression of approvals necessary for the proposed YBI Ramps Improvement Project. Under the National Environmental Policy Act (NEPA), an environmental analysis must be performed if the proposed action is being implemented by a Federal agency, requires a Federal permit, has Federal funding, or requires a Federal approval action. At the state level, any agency that proposes a major action is required to comply with CEQA.

Effective July 1, 2007, FHWA assigned, and Caltrans assumed, NEPA environmental responsibilities for highway projects pursuant to 23 United States Code (U.S.C.) 327. Given Caltrans’ NEPA environmental responsibilities and initiation of the YBI Ramps

Improvement Project by the SFCTA (county agency), it must follow Federal and state environmental laws (NEPA and CEQA). In cooperation with Caltrans, the SFCTA prepared this joint Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed YBI Ramps Improvement Project. Pursuant to these environmental regulations, this Draft EIR/EIS contains a discussion of proposed project alternatives, existing environmental resources, potential permanent and temporary impacts, and proposed mitigation.

SFOBB Eastern Span Seismic Safety Project

Treasure Island and Yerba Buena Island Redevelopment Plan

Transition Structure

West Span Bay Bridge Bicycle and Pedestrian Pathway

Source: Google, EDAW/AECOM 2009

0 0.1 0.2 0.3 Miles

Figure 1-4
Influence Footprints of the SFOBB ESSSP, YBITS, and Redevelopment Projects

1.5 Purpose and Need

1.5.1 Project Purpose

The purpose of the proposed project is to improve:

- Traffic safety for drivers using the westbound on- and off-ramps
- Geometric design of the westbound on- and off-ramps on the east side of YBI to and from I-80
- Traffic operation levels of service (LOS) on the westbound on- and off-ramps.

1.5.2 Project Need

The proposed project is needed for the reasons listed below and explained in subsequent paragraphs:

- **Safety:** The accident rate for the on- and off-ramps is higher than the statewide rate for similar facilities.
- **Geometric Design:** The westbound on-ramp merge lengths and off-ramp deceleration lengths on the east side of YBI do not meet current Caltrans standards.
- **Operations:** Projections of 2035 traffic volumes indicate ramp operations at a failing LOS F on both the on- and off-ramps in both the morning and evening peak hours.

Safety: The accident rate for the existing on- and off-ramps is higher than the statewide rate for similar facilities. The accident rate based on data collected over a 3-year period between April 1, 2003 and March 31, 2006 on YBI exceeded the statewide average rate (per million vehicle miles) for total collisions (sum of fatalities, injuries, and property damage) (TASAS Selective Accident Retrieval, Table B).[4] This 3-year period is the latest data available for the existing on- and off-ramps because these ramps have been closed for the construction of the SFOBB ESSSP project. The Actual Accident Rate for the existing westbound on-ramp is 0.75 per million vehicle miles compared to a rate of 0.60 for similar facilities statewide. For the existing westbound off-ramp, the accident rate is 1.4 rate per million vehicle miles compared to a 1.15 for similar facilities statewide. The distance available for westbound on-ramp traffic to merge with mainline traffic is very short and results in abrupt maneuvers of westbound on-ramp and mainline traffic. These factors affect the traffic operations of the facilities and motorists traveling on the freeway mainline and on-ramp. The proposed ramps have been designed to accommodate future traffic operations for the 20-year design horizon as required by Caltrans standards HDM Section 103.2. This would improve the LOS and is anticipated to decrease the accident

[4] TASAS Table B reports for accident data calculations are available for any highway or section of highway, any or all ramps, any or all intersections for any time period specified. The report shows both actual and average rates. The report also shows total accidents, fatalities, injuries, multi-vehicles, wet, dark, persons killed and injured and the significance. Table B was generated for all six ramps on YBI and included in the Draft Project Report (DPR) prepared for this project.

rate potential. In particular, the potential for rear end collisions on the westbound on-ramp are expected to decrease under the proposed project, which has been the predominant type of accident that has occurred in the past.

Geometric Design: The existing westbound on-ramp merge lengths and off-ramp deceleration lengths on the east side of YBI do not meet current Caltrans standards. The existing westbound on-ramp on the east side of YBI has a very short merge distance of approximately 43 meters (141 feet) which calculates to a 1:11 transition rate. It has a steep entrance grade of approximately 10 percent leading to a 122-meter (400 feet) long crest vertical curve, resulting in a 30 km/h (18.6 mph) design speed. Therefore, traffic cannot accelerate to a proper mainline speed of 80 km/h (50 mph) to merge with through traffic. The existing westbound off-ramp diverges from the left-side freeway lane. The left-side exit lane is nonstandard (Highway Design Manual Section 504.2) and is signed for 48 km/h (20 mph). Its geometry includes a short deceleration length and sharp curve upon exiting the mainline, and presents challenges for motorists and large vehicles to maneuver. The proposed ramps would meet Caltrans standards by providing standard lane and shoulder widths and other geometric features such as the divergence angle, acceleration length, and turning radius that would improve the LOS and safety of the ramp. LOS is a qualitative description of a ramp segment or intersection performance based on the criteria outlined in the Highway Capacity Manual (HCM). LOS ranges from A, which indicates free flow or excellent conditions with short delays, to F, which indicates congested or overloaded conditions with extremely long delays. Caltrans criteria are used to establish a goal of LOS C, when possible.

Operations: The existing westbound off-ramp diverges from the left lane of I-80. This left-lane exit requires exiting vehicles to travel in and across the “fast” lanes to exit the freeway. These maneuvers negatively affect the flow of mainline traffic. The distance available for westbound on-ramp traffic to merge with mainline traffic is very short and results in abrupt maneuvers of westbound on-ramp and mainline traffic. Projections of 2035 traffic volumes indicate ramp operations at a failing LOS F on both the on- and off-ramps in both the morning and evening peak hours. Currently, the westbound left-lane off-ramp operates at LOS D in the morning peak hour and at LOS C in the evening peak hour. The existing westbound, on-ramp operates at LOS D in both the morning and the evening peak hours. In the future (2035) no build condition, both the westbound off-ramp and on-ramp would operate at LOS F in both the morning and the evening peak hours. Under the 2035 build condition without ramp meters for, the westbound off-ramp would operate at LOS F in both peak hours, and the westbound on-ramp would operate at LOS F in the morning peak hour and LOS E in the evening peak hour. In the 2035 build condition with ramp meters, the proposed westbound on-ramp would operate at LOS C in both peak hours. The proposed westbound off-ramp without meters would operate at LOS E in both peak hours.

1.6 Logical Termini and Independent Utility

FHWA regulations (23 Code of Federal Regulations [C.F.R.] 771.111 [f]) require that the proposed action:

a. Connect logical termini and be of sufficient length to address environmental matters on a broad scope,

b. Have independent utility or independent significance (be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made), and

c. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The termini of the project are logical because the project intends only to construct the westbound on- and off-ramps in the same area as the existing ramps, i.e., between the northeastern end of YBI and east of the YBI tunnel. The build alternatives carried forward limit the impacts to the Senior Officers' Quarters Historic District to the extent feasible. Evaluation of these alternatives was performed during the PSR and PR stages, and considered both traffic functionality and geometric impacts.

Transportation projects must also have independent utility and the project must be a reasonable expenditure even if no additional transportation improvements are made in the area. The two build alternatives considered in this environmental document represent transportation improvements that would meet the project's purpose and need and would not require additional improvements that would have additional environmental impacts, nor would it restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

1.7 Funding

Funding for the proposed project is anticipated to come from local, state, and Federal sources. The majority of the project would be funded through the state's Highway and Bridge Program with 11.47% of the project costs to be provided by matching funds from the Local Bridge Seismic Retrofit Account for Proposition 1B. The RTP estimate for this project is $183 million with a TIP allocation of $215,450 (MTC 2009).

Table 1-1 below shows the projected capital cost estimate for both alternatives.

Table 1-1: YBI Ramps Improvement Project Alternatives Capital Cost Estimate

Capital Cost	Alt 2b	Alt 4
Construction Cost		
Roadway	$7,370,000	$6,400,000
Structures	$50,600,000	$114,830,000
Subtotal	$57,970,000	$121,230,000
Right-of-Way Cost		
Right-of-Way Capital[1]	$56,000	$3,407,000
Right-of-Way Support	$0	$0
Relocate Utilities	$200,000	$200,000
Subtotal	$256,000	$3,607,000
Total Capital Outlay	**$58,226,000**	**$124,837,000**
Engineering Costs		
Engineering (PAED, PS&E)	$12,000,000	$15,500,000
Construction Administration @ 15%	$8,695,500	$18,184,500
Subtotal	$20,695,500	$33,684,500
Total	**$78,921,500**	**$158,521,500**

[1] The right-of-way capital cost includes temporary and permanent easements from the USCG for both alternatives.

Source: AECOM Transportation, 2010

CHAPTER 2 – PROJECT ALTERNATIVES

2.1 Project Description

This section describes the proposed action and the design alternatives that were developed by a multidisciplinary team to achieve the project purpose and need while avoiding or minimizing environmental impacts. The alternatives carried forward in the draft EIR/EIS are the No Build Alternative, Alternative 2b, and Alternative 4.

The project is located in the City and County of San Francisco on I-80 on the east side of YBI. The SFCTA and Caltrans propose to replace the existing westbound on- and off-ramps located on the east side of YBI with new westbound on- and off-ramps. The other four ramps on YBI would not be closed or result in diminished capacity as a result of the project. Therefore no further analysis of potential impacts to these ramps is needed.

The YBI ramps, built in the early 1960s, provide access to YBI and TI for motorists traveling to and from the SFOBB portion of I-80. The existing ramps need to be upgraded to improve safety, the geometric configurations and traffic operations between YBI and westbound I-80. The total length of the project area is 0.805 kilometer (0.5 mile), and the project's limits are on I-80 from the end of the SFOBB West Span to the beginning of the SAS Structure of the new SFOBB East Span.

2.2 Alternatives

Typically the environmental process includes a range of reasonable build alternatives. A No Build Alternative represents the existing condition. All other alternatives are compared to the No Build. For this document, alternatives advanced for further study included the No Build Alternative and two build alternatives. Alternatives were selected based on the purpose and need for this project—to improve the geometric configuration, operations, and safety of the westbound on- and off-ramps. The No Build Alternative, Alternative 2b, and Alternative 4 are described below.

2.2.1 No Build Alternative

The No Build Alternative assumes that the existing westbound on- and off-ramps on the east side of YBI would remain in place and no further action or improvements would occur. The westbound on- and off-ramps would continue to operate as they are under the No Build Alternative. The eastbound on- and off- ramps on the east side of YBI are part of the SFOBB ESSSP and were evaluated and approved as part of the SFOBB project.

2.2.2 Alternative 2b

Alternative 2b includes removal of the existing westbound on- and off-ramps on the east side of YBI, construction of a westbound loop on-ramp from Macalla Road on the east side of YBI, and construction of a westbound off-ramp to Macalla Road on the east side of YBI.

This alternative proposes to reconstruct two of the existing six on- and off-ramps at the I-80/YBI interchange. The proposed on- and off-ramps would provide standard lane and shoulder widths, and would include the following features:

- Westbound on-ramp on the east side of YBI. This ramp would begin at a "T" intersection at Macalla Road, loop right with a tight radius, and merge onto the north side of the Bay Bridge. The length of this ramp would be approximately 267 meters (876 feet). This ramp would have two traffic lanes, merging into one as it connects to the SFOBB. One lane would be a high occupancy vehicle (HOV) lane[5] and the other a mixed-flow[6] lane.

- Westbound off-ramp on the east side of YBI. This ramp would diverge from the new SFOBB Transition Structure between bents W3 and W4 and terminate at a "T" intersection at Macalla Road. The length of this ramp would be approximately 340 meters (1,115.5 feet). A stop sign is proposed at the ramp terminus and meets the 20-year design needs.

- Macalla Road would be widened for approximately 202 meters (662.7 feet) adjacent to the terminus of the westbound on- and off-ramps. The existing roadway is about 6 meters (19.7 feet) wide near the ramp terminus. The roadway widening is required to accommodate a future 3.7-meter-wide (12.1 feet) multiuse pedestrian/bike path and two 3.7-meter-wide (12.1 feet) lanes within the Caltrans right-of-way. A retaining wall would be constructed adjacent to Macalla Road to provide the required width. The height of the retaining wall would vary from 1.2 to 4.9 meters (3.9 to 16.1 feet) and would retain the hillside above Macalla Road. The stairway adjacent to the Caltrans substation would be relocated to the west side of the building to make room for the new retaining wall. The roadway width would vary around the curve at South Gate Road to provide proper width for truck turning movements.

- The westbound on- and off-ramps would terminate at Macalla Road where Quarters 10/Building 267 are currently located, requiring their removal.

Figure 2-1 illustrates the proposed YBI ramp features associated with Alternative 2b.

2.2.3 Alternative 4

Alternative 4 includes the removal of the existing westbound on- and off-ramps on the east side of YBI, construction of a new westbound on-ramp from South Gate Road, and construction of a new westbound off-ramp to Macalla Road on the east side of YBI.

This alternative proposes to reconstruct two of the existing six on- and off-ramps at the I-80/YBI interchange. The proposed on- and off-ramps would provide a standard lane and shoulder widths, and would include the following features:

---

[5] Under the Treasure Island Transportation Management Act (Assembly Bill 981, signed into law in September 2008), high occupancy vehicles (defined as THREE passengers or more) would be able to exit or enter Treasure Island free of charge.

[4] A mixed-flow lane is a general purpose travel lane with no traffic restrictions.

Source: Nima/USGS 2004; DMJM Harris, EDAW 5/09

Figure 2-1
Alternative 2b

Not To Scale

- Westbound on-ramp on the east side of YBI. This ramp would begin at South Gate Road, proceed east paralleling the eastbound on-ramp, loop under the new SFOBB Transition Structure near its eastern end to provide adequate merging distances, and cross over the westbound off-ramp along the north side of the Bay Bridge. The length of this ramp would be approximately 879 meters (2,883.9 feet). An HOV lane would not be provided.

- Westbound off-ramp on the east side of YBI. This ramp would diverge from the new SFOBB Transition Structure between bents W2 and W3, parallel the Transition Structure, cross under the westbound on-ramp, and terminate at a “T” intersection at North Gate Road. The length of this ramp would be approximately 356 meters (1,168 feet). A stop sign is proposed at the ramp terminus and meets the 20-year design needs. An HOV lane would not be provided.

- Pavement reconstruction on Macalla Road and South Gate Road at the ramp intersections is proposed to ensure a proper pavement conform and truck turning movements.

- Quarters 10/Building 267 and associated landscaping would remain in place.

- A use permit and/or a permanent aerial easement would be required from the USCG to construct the westbound on-ramp over USCG property.

Figure 2-2 illustrates the proposed YBI ramp features associated with Alternative 4.

2.2.4 Tree and Sensitive Plant Replacement

As part of Alternative 2b and Alternative 4, the SFCTA will plant replacement trees and vegetation to benefit aesthetics. The Treasure Island/Yerba Buena Island Development Plan’s Habitat Management Plan will be considered in the development of a woodland habitat revegetation plan. In addition, replanting efforts would benefit native plant and wildlife habitat values on YBI post-construction.

Temporarily disturbed woodland and forested areas would be restored after completion of construction activities. Trees removed in temporary disturbance areas would be replaced utilizing native species appropriate to the island. Native trees that are removed, such as 2 Coast live oak trees, would be replaced at a 3:1 ratio. Other permanently affected woodland and forest habitat will be replanted at a location identified in coordination with stakeholder agencies and utilizing native species appropriate to the location, Stakeholder agencies may include Caltrans, the SFCTA (CEQA lead agency), and/or CDFG. A sensitive, native plant species, stinging phacelia (Phacelia malvifolia), has been documented within the mixed broadleaf conifer and eucalyptus woodland forest habitat in the biological study area (BSA). A portion of the population will be affected by construction activities. This plant is considered a Rare, Unusual, or Significant plant of local concern (A2) by the East Bay Chapter of the CNPS. Stinging phacelia plants temporarily and/or permanently removed during project construction will be replanted as part of the woodland habitat revegetation effort. This species is not listed as a sensitive statewide species, by CDFG, or CNPS, and does not qualify for protection and the activities would not receive Federal funding.

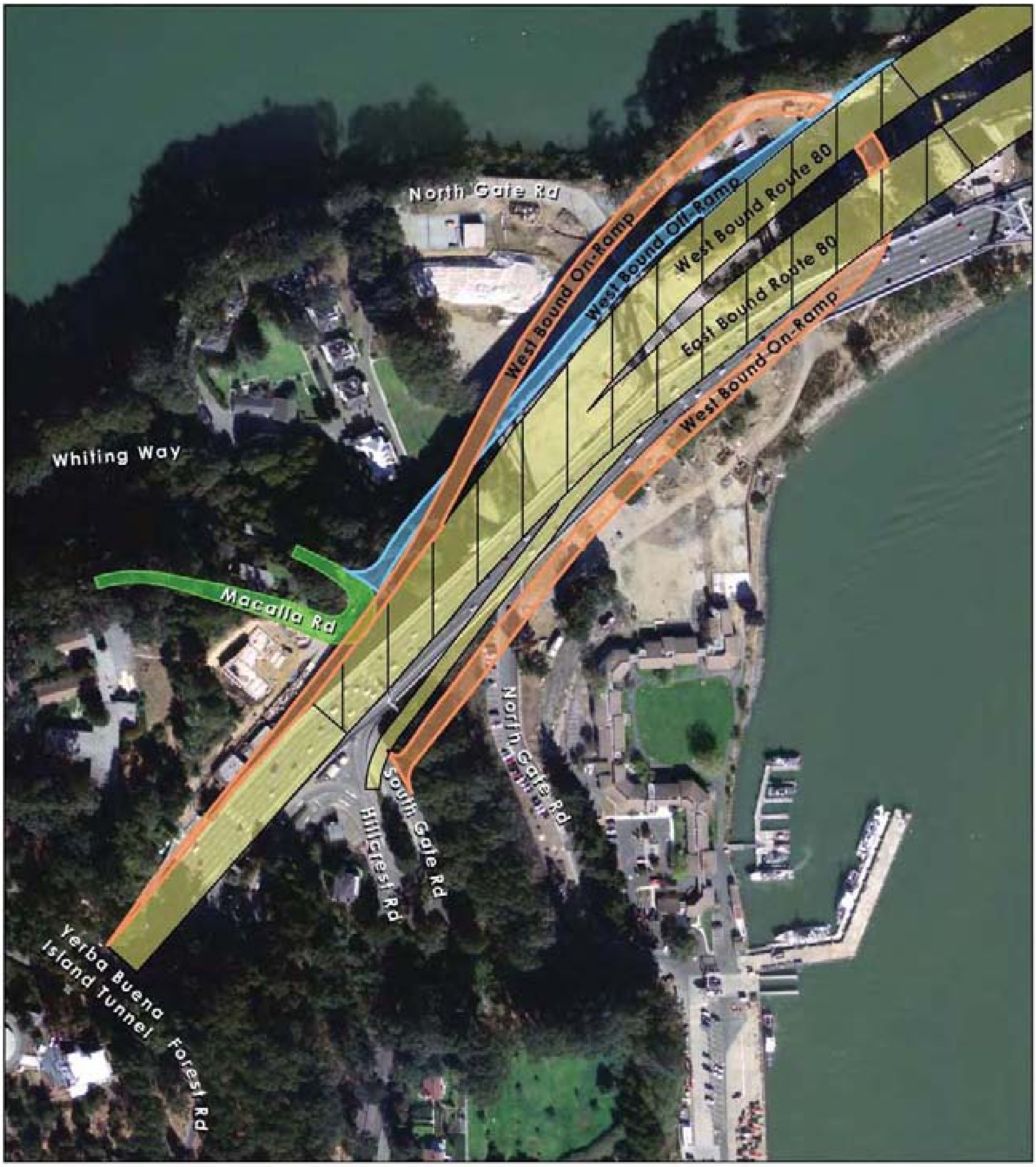
SFCTA will develop a woodland habitat revegetation plan 30 days prior to construction that outlines an implementation strategy, monitoring plan, performance standards, and long-term management to facilitate and document success of the revegetation effort. The revegetation plan will be implemented under the oversight of a qualified biologist.

2.2.5 Comparison of Alternatives

Alternatives 2b and 4 both include the construction of a westbound on-ramp and westbound off-ramp. The alternatives would have the following unique features as shown in Table 2-1 below:

Table 2-1: Comparison of Alternatives

	Alternative 2b	Alternative 4
Westbound On-Ramp	• 267 meters (876 feet) • Beings at "T" intersection at Macalla Road. • Right loop merge onto north side of Bay Bridge • Two traffic lanes, merging into one as it connects to SFOBB. One lane would be HOV lane, and one lane would be mixed-flow.	• 879 meters (2,883.9 feet) • Begins at South Gate Road. • Ramp proceeds east, loops under new SFOBB, and crosses over westbound off-ramp along north side of SFOBB. • HOV lane would not be provided.
Westbound Off-Ramp	• 340 meters (1,115.5 feet) • Diverges from SFOBB Transition Structure between bents W3 and W4. • Terminates at "T" intersection at Macalla Road.	• 356 meters (1,168 feet) • Diverges from SFOBB Transition Structure between bents W2 and W3. • Terminates at "T" intersection at North Gate Road.
Macalla Road	• Widening of Macalla Road approximately 202 meters (662.7 feet) adjacent to the terminus of the westbound on- and off-ramps.	• Pavement reconstruction on Macalla Road and South Gate Road at the ramp intersections is proposed to ensure a proper pavement conform and truck turning movements.
Quarters 10/Building 267	• Quarters 10/Building 267 would be removed.	• Quarters 10/Building 267 would remain in place.
Tree and Sensitive Plant Replacements	• Replacement trees and vegetation will be planted post-construction	• Replacement trees and vegetation will be planted post-construction



Alternative 4 Proposed Ramps

- Proposed Westbound Off-Ramp
- Proposed Westbound On-Ramp
- Proposed Macalla Road Improvements

Separate Project Currently Under Construction

- San Francisco-Oakland Bay Bridge East Span Seismic Safety Project
- Transition Structure Portion of SFOBB

Source: Nima/USGS 2004; DMJM Harris, EDAW 5/09

Not To Scale

Figure 2-2
Alternative 4

2.3 Construction Costs and Staging

The estimated total construction costs for Alternative 2b is approximately $58 million and for Alternative 4 is approximately $125 million.

2.4 Construction Activities and Schedule

The following discussion provides an overview of the construction activities.

2.4.1 Construction Staging

The staging areas for both Alternative 2b and Alternative 4 would be the same. Both alternatives would utilize the staging areas used for the SFOBB ESSSP. The primary staging area is located east of the Officer’s Quarters Historic District and north of the SFOBB. Each alternative would use a secondary staging area south of the SFOBB and north of the U.S. Coast Guard (USCG) facilities. Storage of equipment and materials on-site would be limited to the staging and construction areas to minimize ground disturbance. Access for construction vehicles and equipment would be via Macalla Road, South Gate Road, and North Gate Road. Figures 2-3a and 2-3b illustrate the staging and storage areas and construction access route for Alternative 2b and 4, respectively.

2.4.2 Construction Methods

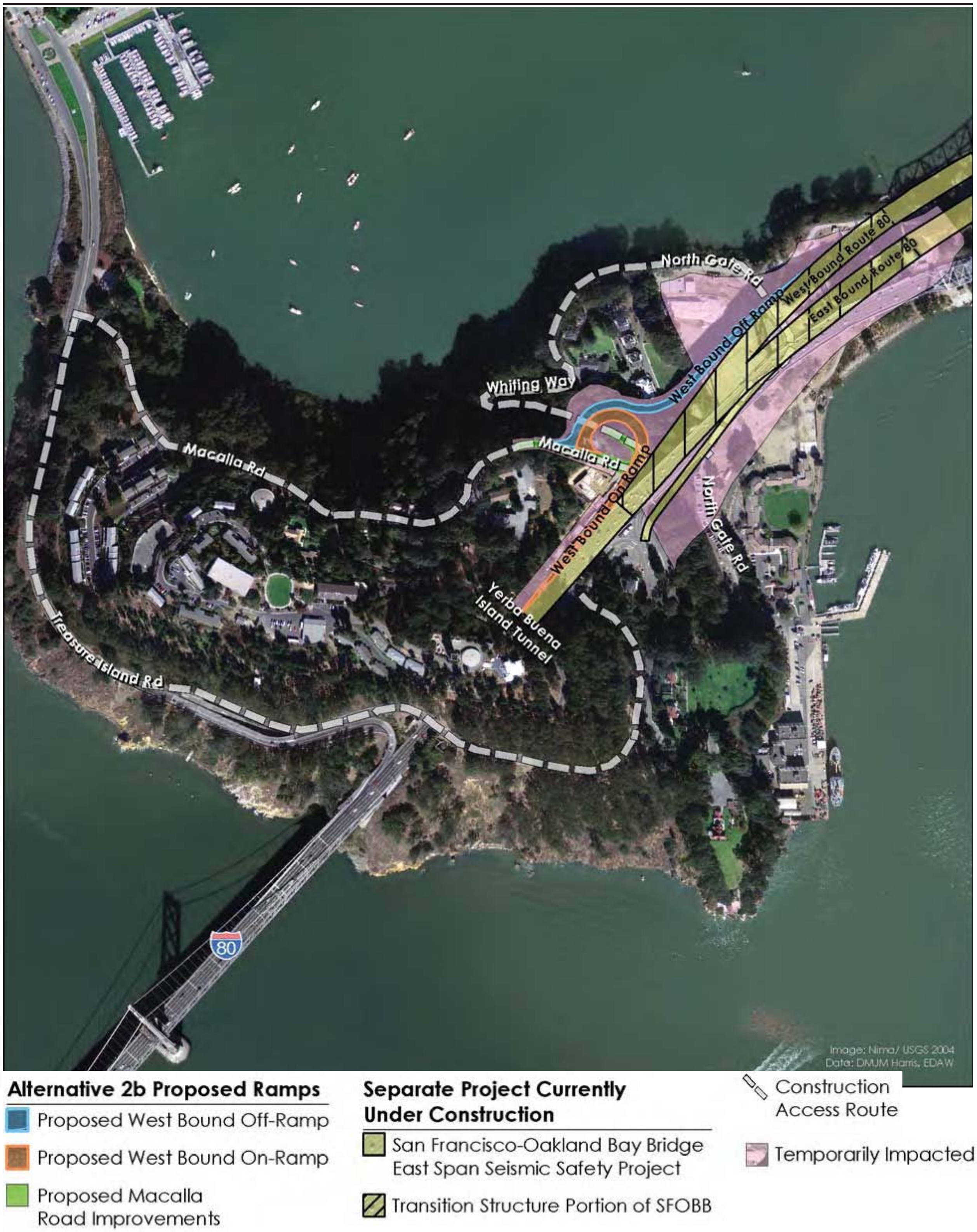
Both build alternatives would involve standard construction techniques and require large-scale construction equipment and labor-intensive activities. General activities would include demolition, excavation, grading, vegetation removal, utility relocation, temporary falsework erection, roadway/structure construction, landscaping, and demobilization.

The contractor will determine the means and methods of construction but typical construction equipment would include drill rigs, backhoes, cranes, concrete trucks, forklifts, paving vehicles, and delivery trucks. The construction period is estimated to be 2 years for both build alternatives.

2.4.3 Construction Timing

The Transportation Management Plan (TMP) guides construction staging and provides traffic handling information. Construction staging for the build alternatives assumes that a typical construction schedule would be used for the YBI Ramps Improvement Project. Efforts would be made to concentrate construction activities during off-peak hours. In addition, construction hours are subject to USCG restrictions. Scheduling construction activities during off-peak hours would ensure that roadways in the construction area are open during the peak traffic times to minimize disruption. The two primary types of construction activities that may occur during low traffic periods are:

- Erection of falsework for construction of ramp structures; and,
- Construction of Macalla Road and adjacent retaining wall.



Source: Nima/USGS 2004; DMJM Harris, EDAW 6/09

0 250 500 1000 Feet

Figure 2-3a
Alternative 2b Construction Staging Areas and Access Route

Source: Nima/USGS 2004; DMJM Harris, EDAW 6/09

Figure 2-3b
Alternative 4 Construction Staging Areas and Access Route

2.4.4 Construction Schedule

A breakdown of Alternative 2b and 4 primary stages anticipated for construction by activity and month is reflected in Table 2-2a and Table 2-2b below. Figure 2-4 and 2-5 illustrates the construction stages graphically for Alternatives 2b and 4, respectively.

Table 2-2a: Alternative 2b

Stage	Construction Activities	Estimated Timeframe	Duration
1	Construct falsework over Macalla Road, foundations, and superstructure	January 2012 - October 2013	10 Months
2	Construct retaining wall, paving at retaining wall, and superstructure	May 2013 - March 2013	11 Months
3	Construct abutment, superstructure, and Macalla Road improvements	April 2013 - March 2014	12 Months
4	Construct sidewalk and off-ramp transition structure widening	November 2013 - August 2014	10 Months
5	Construct viaduct structure widening	May 2014 - January 2015	9 Months

The total construction duration for Alternative 2b would be approximately 3 years (January 2012 to January 2015).

Table 2-2b: Alternative 4

Stage	Construction Activities	Estimated Timeframe	Duration
1	Construct WB on-ramp foundation and superstructure	January 2012 - June 2013	18 months
2	Construct Macalla Road Improvements	July 2013 - August 2013	2 months
3	Construct WB off-ramp	September 2013 - August 2014	12 months
4	Construct WB on-ramp tie in	September 2014 - June 2015	10 months

The total construction duration for Alternative 4 would be approximately 3.5 years (January 2012 to June 2015).

2.4.5 Temporary Roadway Closures

2.4.5.1 Stage 1 – Macalla Road Closure

Stage 1 would involve the construction of westbound on-ramp falsework over Macalla Road from Bent W10AL to E8, which will be constructed as a contract change order (CCO) during Caltrans YBITS Contract 1, prior to the YBI Westbound Ramps Project. During falsework construction, the existing westbound on-ramp and the portion of Macalla Road would result in temporary detours and single-lane closures. These impacts would be minimized through coordination with the USCG and emergency service providers. Access to the islands would be maintained throughout project construction. Temporary traffic control would be implemented. The westbound on-ramp traffic will be detoured to the other on-ramp on the west side of the YBI tunnel via

Treasure Island Road. Once falsework is completed, the westbound on-ramp structure from Bent W9L to W7 and westbound off-ramp structure from Bent W5L to W8 would be constructed. These construction activities would not involve any traffic impacts. The existing westbound on-ramp and Macalla Road would remain open during this phase.

2.4.5.2 Stage 2

Stage 2 would involve construction of a retaining wall on the west side of Macalla Road and new pavement in front of the retaining wall. During construction, one lane of Macalla Road would be closed while the other lane (east side of the roadway) would provide “controlled” two-way traffic. Temporary traffic control would be installed and flaggers would be stationed within the construction limits to guide motorists through the construction zone. The existing substation concrete stairway on the west side of the roadway would be relocated to the west side of the substation prior to the retaining wall construction. The existing westbound on-ramp would remain open to traffic during this phase.

2.4.5.3 Stage 3

Stage 3 would involve construction of the westbound off-ramp structure from Bent W8 to Abutment W11, westbound on-ramp structure from Bent W7 to abutment W11, and the remainder of Macalla Road adjacent to the terminus of the on- and off-ramps. During the construction, one lane would accommodate two-way traffic on Macalla Road (outside the hairpin curve), which would be diverted to the west side of the roadway. Temporary traffic control would be installed and flaggers would be stationed within the construction limits to guide motorists through the construction zone. The existing westbound on-ramp would remain open to traffic during this phase.

2.4.5.4 Stage 4

Stage 4 would involve construction of a sidewalk on Macalla Road in front of the new retaining wall. One lane would accommodate two-way traffic on Macalla Road (inside the hairpin curve), which would be diverted to the east side of the roadway. Temporary traffic control would be installed and flaggers would be stationed within the construction limits to guide motorists through construction area with precaution and safety. The existing westbound on-ramp would remain open to traffic during this phase.

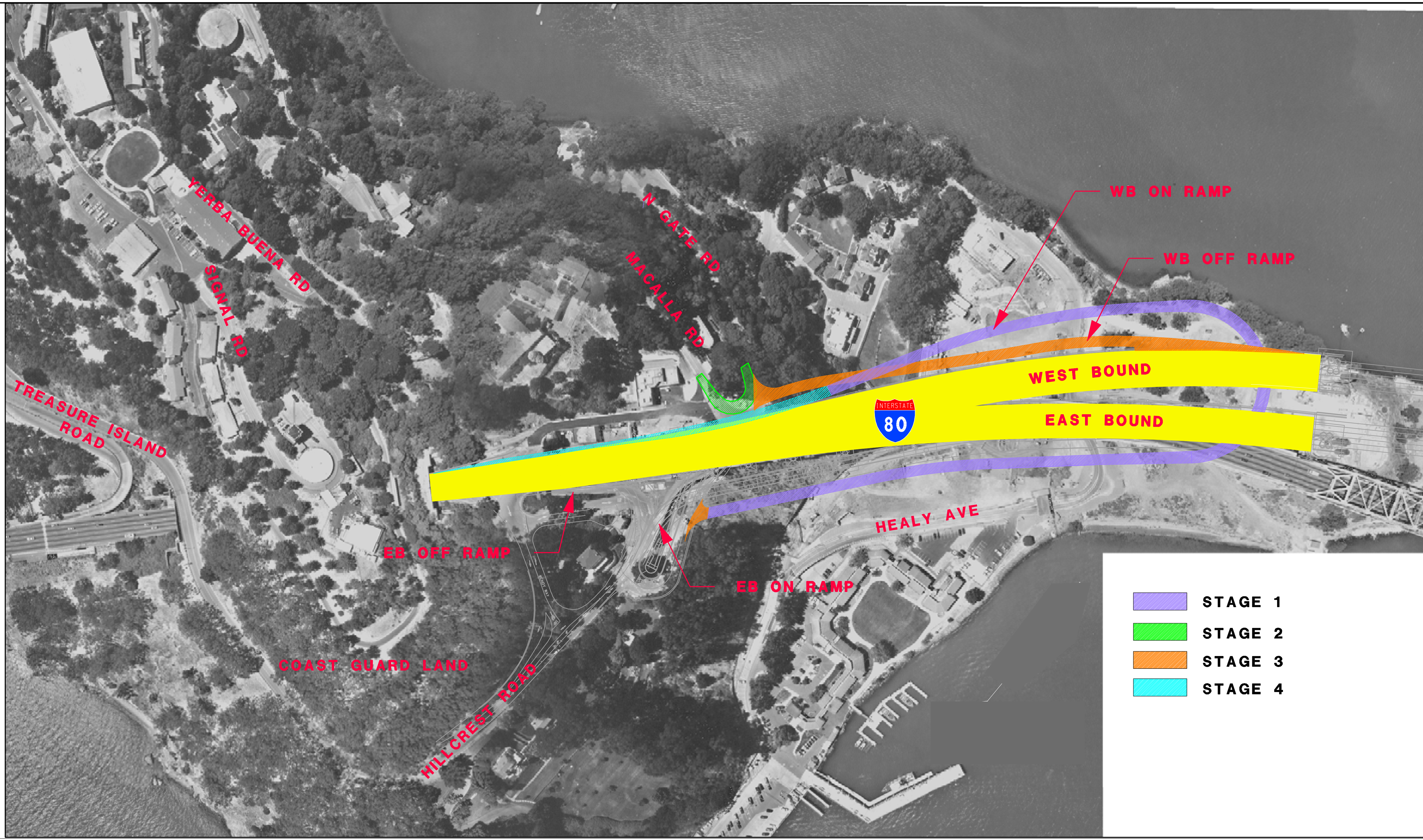
2.4.5.5 Stage 5

Stage 5 would involve the construction of the last segment of the westbound on-ramp structure-viaduct and structure widening. During the construction, the right shoulder of the westbound transition structure would be closed from the YBI tunnel to Sta “W” 51+20. Temporary traffic control systems would be implemented and the duration and schedule of the shoulder closure would be confirmed by the RE together with the CTM. The temporary traffic control systems would comply with the Caltrans bridge standard shoulder closure charts to reduce the risk of any impacts. These construction activities would require closure of the existing westbound on-ramp. A detour to the westbound on-ramp on the west side of YBI would be provided. Macalla Road would remain open to traffic.

Source: AECOM Transportation 2010

Not to Scale

Figure 2-4
Alternative 2b Construction Stages



Source: AECOM Transportation 2010

Not to Scale

Figure 2-5
Alternative 4 Construction Stages

2.5 Selection of Alternative

After the public circulation and review period for the Draft EIR/EIS, all comments will be considered, and the SFCTA and Caltrans will identify a preferred alternative in the final EIR/EIS. In accordance with CEQA, the SFCTA would certify that the project complies with CEQA, prepare findings for all significant impacts identified, prepare a Statement of Overriding Considerations for impacts that would not be mitigated below a level of significance, and certify that the findings and Statement of Overriding Considerations have been considered prior to project approval. If the SFCTA approves the project, it would then file a Notice of Determination with the State Clearinghouse that would identify whether the project would have significant impacts, whether mitigation measures were included as conditions of project approval, whether findings were made, and whether a Statement of Overriding Considerations was adopted. With respect to NEPA, Caltrans, as assigned by FHWA, would consider comments and document its decision regarding the selected alternative, project impacts, and mitigation measures in a Record of Decision (ROD) in accordance with NEPA. If the selected alternative is a build alternative, the selected alternative will advance to the design and permitting stage. Based on available funding, permitting and construction could begin as early as 2012.

2.5.1 Alternatives Considered but Eliminated from Further Discussion

CEQA Guidelines Section 15126.6 requires the lead agency to identify the alternatives that were considered but rejected, and to briefly explain the reasons why the lead agency found them to be infeasible.

In September 2008, Caltrans prepared a SAFETEA-LU Coordination Plan for the project and invited agencies to become participating or cooperating agencies during the NEPA environmental review process. The goals are to make the environmental review process more efficient and timely, provide a process for resolving interagency disagreements, protect environmental and community resources, and expedite approvals of urgently needed transportation improvements. The Coordination Plan included a notice of initiation and letters were sent to stakeholder agencies and local interest groups to become cooperating or participating agencies in the YBI Ramps Improvement Project environmental process. Please refer to Chapter 5, Comments and Coordination for additional description of coordination efforts.

Combined documentation addressing both CEQA and NEPA is the most efficient means to comply with state and Federal requirements. This allows for one document to be prepared and circulated for public review. The alternatives considered and eliminated during the planning process also took into account Section 4(f) of the U.S. Department of Transportation Act which requires the analysis to consider that no prudent and feasible alternative exists that would avoid the use of protected resource. Appendix B discusses the relevance of 4(f) resources to the alternatives eliminated as well as details on the alternatives carried through this EIR/EIS.

The planning process for identifying, designing and screening alternatives began with the study of many alternatives from a conceptual feasibility perspective in 2002. A number of build alternatives were presented to stakeholders and the public during several meetings by the project development team to solicit comments and suggestions on the design. Nonstandard features of the design were discussed and the results were used to further refine the alternatives in the Project Study Report (PSR) prepared by

Caltrans in December 2007. The PSR included a summary of the results of the alternatives evaluation.

Throughout the planning process, several potential avoidance configurations were explored in order to attempt to avoid Section 4(f) properties, consisting of listed and eligible historic properties in close proximity to the ramp project locations. Alternative 6 described in this section represents the Avoidance Alternative that was created in an attempt to avoid the three known 4(f) resources, the Senior Officers' Historic District, Quarters 1/Nimitz House and Quarters 10 (including Building 267). Alternative 6 proposes to construct both off- and on-ramps as depicted in Figure 2-14, and would be positioned inside a tunnel system mined through this portion of Yerba Buena Island. This Avoidance Alternative introduces additional safety and operational concerns that would result in additional environmental impacts. In addition, the overall estimated cost of Alternative 6 would range from seven to thirteen times as much as the other alternatives. Therefore, the Avoidance Alternatives is not feasible and prudent and could not be selected. This determination is described in more detail in Appendix B, Section 4(f).

After many conceptual planning refinements, the PSR recommended that two of the alternatives, Alternatives 2b and 4, be carried forward for analysis in this EIR/EIS. The remaining seven build alternatives were determined to be nonviable and were eliminated from further study for various reasons. These alternatives are included in the Alternatives Screening Analysis Summary presented in Table 2-3 along with the recommended alternatives for comparison purposes. A brief summary of environmental effects of each alternative is included in Table 2-3 along with a color coded ranking of green=low, yellow=medium and red=high. Low in this case represents less potential for an environment effect and High means a greater potential for an environmental effect. The reasons for the elimination of the nonviable alternatives are briefly summarized below.

The range of alternatives discussed in the PSR was limited to the design and reconstruction of the ramps on the east side of the YBI tunnel. Nonviable alternatives considered reconstructing the eastbound off-ramp but it was deemed infeasible due to the mandatory closure of the SFOBB, geometric challenges, effects on land use, excessive cost and safety concerns The ramps west of the YBI tunnel have not been considered for reconstruction because the space available is insufficient to provide enough room for the ramps to be designed and reconstructed to meet current geometric standards.

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Table 2-3: Alternatives Screening Analysis Summary
Yerba Buena Island Ramps EIR/EIS

Screening Level / Criteria	Alternative 1 **Nonviable** **Figure 2-6**	Alternative 1A **Nonviable** **Figure 2-7**	Alternative 2 **Nonviable** **Figure 2-8**	Alternative 2A **Nonviable** **Figure 2-9**	Alternative 2B **Analyzed in EIR/EIS** **Figure 2-10**	Alternative 3 **Nonviable** **Figure 2-11**	Alternative 4 **Analyzed in EIR/EIS** **Figure 2-12**	Alternative 5 **Nonviable** **Figure 2-13**	Alternative 6 **Nonviable** **4(f) Avoidance** **Figure 2-14**
Description: **Design and reconstruct two of six existing on- and off-ramps at I 80/YBI interchange**	Eastbound (EB) off-ramp east side of YBI diverges from the West Tie-in structure, loops left under the Transition Structure, terminates in "T" intersection at Macalla Road. EB on-ramp east side of YBI begins at Hillcrest Road, curves left, and climbs to merge with Transition Structure. Westbound (WB) on-ramp east side of YBI begins in "T" intersection at Hillcrest Road, parallel to EB on-ramp, loops left under Transition Structure near east end, crosses over both WB on- and off-ramps, merges with West Tie-in structure. WB off-ramp east side of YBI diverges from Transition Structure near eastern end, crosses over the westbound on ramp, crosses under WB on-ramp, curves right, and terminate in a "T" intersection at Macalla Road**.**	EB off-ramp east side of YBI loops under Transition Structure farther east and terminates in "T" intersection at Macalla Road south of termination location of Alternative 1. EB on-ramp on east side of YBI begins at Hillcrest Road south of location of Alternative 1, curves left, crosses over eastbound off-ramp, and merges with Transition Structure. WB on-ramp on east side of YBI begins in "T" intersection at Hillcrest Road, travels east, loops left under Transition Structure east end, crosses over both the westbound on- and off-ramps, and merges with the West Tie-in structure. WB off-ramp on east side of YBI diverges from the Transition Structure eastern end, curves right, and terminates in "T" intersection at Macalla Road, south of termination location of Alternative 1.	Shorter ramp length than Alternative 1. Similar to Alternative 1A except for the following: EB on-ramp on east side merges with Transition Structure west of merge location. WB on-ramp on east side begins in "T" intersection at Macalla Road, travels east, loops right, crosses over eastbound off-ramp, and merges with Transition Structure. WB off-ramp on east side diverges from Transition Structure near its eastern end, curves right, merges with westbound on-ramp, and terminates in a "T" intersection at Macalla Road.	Similar to Alternative 2 except for the following: EB off-ramp on east side of YBI diverges from West Tie-in structure, hook right, and terminate at Hillcrest Road. EB on-ramp on the east side of YBI. This ramp would begin at Hillcrest Road, curve right, and merge with the Transition Structure.	WB on-ramp on east side of YBI begins at "T" intersection at Macalla Road, merges onto north side of Bay Bridge. Two traffic lanes, merging into one as it connects to SFOBB. One lane would be HOV lane, and one lane would be mixed-flow. WB off-ramp diverges from SFOBB Transition Structure between bents W3 and W4 and terminates at "T" intersection at Macalla Road. Widening of Macalla Road would be necessary adjacent to the terminus of the WB on- and off-ramps.	Similar to Alternative 2 except for the following: EB off-ramp on east side of YBI diverges from West Tie-in structure, loops right over the USCG property, and terminates at "T" intersection at Hillcrest Road. EB on-ramp on east side of YBI begins at Hillcrest Road south of ramp location in Alternative 2. WB on-ramp on east side of YBI begins at "T" intersection at Macalla Road, merges with westbound off-ramp, curves right near shoreline, travels over western side of historic district, diverges from WB off-ramp, curves right, and merges with Transition Structure. WB off-ramp on east side of YBI diverges from West Tie-in structure, curves right, merges with WB off-ramp, travels over west side of two historic properties curves left near shoreline, and terminates at "T" intersection at Macalla Road. This alternative attempts to avoid two historic properties in this area (Senior Officers' Quarters Historic District and Quarters 1/Nimitz House)	WB on-ramp begins at South Gate Road, proceeds east, loops under new SFOBB, and crosses over WB off-ramp along north side of SFOBB. No HOV lane would be provided. WB off-ramp diverges from SFOBB Transition Structure between bents W3 and W4 and terminates at "T" intersection at North Gate Road. Pavement reconstruction on Macalla Road and South Gate Road at ramp intersections proposed to ensure proper pavement conforms and truck turning movements can be accommodated. This alternative attempts to avoid two historic properties in this area (Senior Officers' Quarters Historic District and Quarters 1/Nimitz House).	Alternative proposes a standard tight diamond intersection with minimal nonstandard design features and would have minor impacts on USCG access and operations. This alternative attempts to avoid two historic properties in this area (Senior Officers' Quarters Historic District and Quarters 1/Nimitz House). However, this alternative would require extensive excavation that would require daylighting the existing YBI tunnel to allow for construction of WB on-ramp and EB off-ramp. This tunnel is also a historic 4(f) property.	Alternative would avoid all 4(f) resources, however, geometric design flaws, operational issues and safety problems would be present. WB on and off-ramps would have several nonstandard features including an excessive divergence angle, short-on ramp acceleration length, short-vertical curve lengths and short superelevation transition length. Similar to Alternative 5, this alternative would also require extensive excavation into the hillside with the inclusion of two ramp tunnels. The WB off-ramp would include a 152.4 meter (500 foot) long tunnel and the WB on-ramp tunnel portion would be 128 meter (420 feet) long. Macalla Road would need widening to allow for two lanes. A new traffic signal would need to be installed at the termini location, where a building would need to be removed.

Table 2-3: Alternatives Screening Analysis Summary
Yerba Buena Island Ramps EIR/EIS

Screening Level / Criteria	Alternative 1 Nonviable Figure 2-6	Alternative 1A Nonviable Figure 2-7	Alternative 2 Nonviable Figure 2-8	Alternative 2A Nonviable Figure 2-9	Alternative 2B Analyzed in EIR/EIS Figure 2-10	Alternative 3 Nonviable Figure 2-11	Alternative 4 Analyzed in EIR/EIS Figure 2-12	Alternative 5 Nonviable Figure 2-13	Alternative 6 Nonviable 4(f) Avoidance Figure 2-14
Screening Level : Purpose and Need									
Meets Caltrans requirements (to the greatest extent practicable - feasible) to improve on- and off-ramp safety, design and operation standards for vehicle traffic to and from Yerba Buena Island and Treasure Island.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Screening Level : Engineering Considerations									
Geometry and Safety	EB off ramp Horseshoe-shaped ramp is undesirable for traffic safety reasons resulting in reduced stopping sight distance due to horizontal obstructions from bridge columns and reduced design speeds at the off ramp. The 45 meter (150 foott) radius for the off ramp crosses under the transition structure. WB on ramp – Length of ramp is 898 meters (2,946 feet). Ramp has a reduced design speed of 40.2 km/h (25 mph) due to radius of horizontal curve at loop location (loop under main line). Restricted sight distance due to horizontal obstructions at bridge columns. Undesirable reverse curves, short tangent transitions for super elevation. May accommodate HOV lane with additional cost for widening structure and ROW. WB off ramp – undesirable reverse curve before Macalla Rd. approach. Length of ramp is 1,061 feet (324 meters). Length of ramp is constrained by west limit of self anchored suspension bridge and	EB off ramp Horseshoe-shaped ramp undesirable for traffic safety reasons resulting in reduced stopping sight distance and design speeds at the EB off ramp. The 53 meter (175 foot) radius for the off ramp meets recommendations for ramp radii. Both on ramps can accommodate HOV bypass lanes. WB on ramp – Length of ramp is 898 meters (2,946 feet). Ramp has a reduced design speed of 40.2 km/h (25 mph) due to horizontal curve at loop location (loop under main line). Restricted sight distance due to horizontal obstructions at bridge columns. Undesirable reversed curves, short tangent transitions for super elevation. Similar geometry as alternative 1A WB off ramp – undesirable reverse curve before Macalla Rd. approach. Length of ramp is 1,061 feet (324 meters). Similar geometry as alternative 1. Length of ramp is constrained by west limit of self anchored suspension bridge and inability to initiate ramp widening on	Elevated WB on- and off-ramps through historic district put more traffic further into the site.. Requires additional right-of-way (ROW) north of the existing SFOBB mainline. WB on ramp – ramp requires reduced design speed to 32.2 km/h (20mph) at the loop location. Length of ramp is 546 meters (1,791 feet). WB off ramp – short tangent transition for the reverse curve. Length of ramp is 412 meters (1,352 feet). Length of ramp is constrained by west limit of self anchored suspension bridge and inability to initiate ramp widening on self anchored suspension bridge.	Elevated WB on- and off-ramps through historic district put more traffic further into the site. Requires additional ROW north of the existing SFOBB mainline. WB on ramp – ramp requires reduced design speed to 32.2 km/h (20 mph) at the loop location. Length of ramp is 546 meters (1,791 feet). Similar geometry as alternative 2. WB off ramp – short tangent transition for the reverse curve. Length of ramp is 412 meters (1,352 feet). Similar geometry as alternative 2. Length of ramp is constrained by west limit of self anchored suspension bridge and inability to initiate ramp widening on self anchored suspension bridge.	Length of this ramp would be approximately 267 meters (876 feet). The WB on ramp would have two traffic lanes, merging into one as it connects to the SFOBB. One lane would be a high occupancy vehicle (HOV) lane and the other a mixed-flow lane. WB on ramp – ramp requires reduced design speed to32.2 km/h (20mph) at the loop location. Ramp length 873 feet (266 meters). WB off ramp – short tangent transition for the reverse curve.	Elevated WB on- and off-ramps around historic district and over S.F.Bay put more traffic further into the site. Requires additional ROW north of the existing SFOBB mainline. WB on ramp – ramp requires reduced design speed to 32.2 km/h (20mph) at merge location with WB off ramp location. Length of ramp is 688 meters (2,256 feet). WB off ramp – short tangent transition for the reverse curve. Length of ramp is 592 meters (1,942 feet). Length of ramp is constrained by west limit of self anchored suspension bridge and the inability to initiate ramp widening on self anchored suspension bridge.	The length of the WB on ramp would be approximately 879 meters (2,883.9 feet). This ramp would have two traffic lanes, merging into one as it connects to the SFOBB. WB on ramp – long loop ramp requires reduced design speed to 32.2 km/h (20mph) at the loop location (loop under the main span). Ramp length 880 meters (2,886 feet). WB off ramp minimum number of design exceptions with Caltrans Highway Design Manual. Ramp length 397 meters (1,300 feet). Length of ramp is constrained by west limit of self anchored suspension bridge and inability to initiate ramp widening on self anchored suspension bridge.	Diamond configuration interchange takes less horizontal area however, ties into new Bay Bridge design would be challenging due to relative short ramp lengths and vertical changes required to make connections. Elimination of tunnel and retention of double deck viaduct would require additional seismic tie in considerations. WB on ramp – desirable geometry, but high cost for this alternative. Includes tunnel widening, relocation/demolition of structures and buildings located at the top of the tunnel, additional embankment. Length of ramp is 357 meters (1,172 feet). WB off ramp minimum number of design exceptions with Caltrans Highway Design Manual. Length of ramp is 309 meters (1,040 feet). Length of ramp is constrained by west limit of self anchored suspension bridge and inability to initiate ramp widening on self anchored suspension bridge. The bridge connecting	Avoidance of the historic district would require challenging construction of the WB on and off ramps including tunnels through a steep hillside iin a confined area. At ramp exit, sag vertical curve would need to accommodate the ramp grade change so that the off-ramp can cross up and over the proposed westbound on-ramp. WB on ramp – undesired geometry: S curve, short tangent. Curve radius would limit speed to 24.1 to 32.2 km/h (15 to 20 mph) maximum and cannot attain 80.5 km/h (50 mph) merge speed to mainline because ramp acceleration length is too short and only 79 meters (260 feet). Future addition of HOV lane may require tunnel widening in the future which would be prohibitively expensive. WB off ramp – inadequate space and tight radius. Would require reduced exit speed to 27.4 km/h (17 mph) from the mainline. Ramp length would only be

Table 2-3: Alternatives Screening Analysis Summary
Yerba Buena Island Ramps EIR/EIS

Screening Level / Criteria	Alternative 1 Nonviable Figure 2-6	Alternative 1A Nonviable Figure 2-7	Alternative 2 Nonviable Figure 2-8	Alternative 2A Nonviable Figure 2-9	Alternative 2B Analyzed in EIR/EIS Figure 2-10	Alternative 3 Nonviable Figure 2-11	Alternative 4 Analyzed in EIR/EIS Figure 2-12	Alternative 5 Nonviable Figure 2-13	Alternative 6 Nonviable 4(f) Avoidance Figure 2-14
	inability to initiate ramp widening on self anchored suspension bridge.	self anchored suspension bridge.						Hillcrest Dr. to Treasure Island currently located on east side of Yerba Buena Island would have to be replaced with this alternative.	61 meters (200 feet). At Macalla Road connection tie-in speed would drop to 24.1 km/h (15 mph). Ramp length would only be 30 meters (100 feet). Grade would exceed allowable 8% standard, ranging from 10-16%. High cost of construction due to hillside excavation and grade separations with WB on ramp.
Access, Traffic Circulation and Safety	EB and WB off-ramps are isolated and both terminate at Macalla Road. May create driver confusion and some increased potential for wrong-way movements onto the off ramps, particularly the EB off ramp. Location of WB on ramp is intuitive relative to the EB off-ramp. Access to USCG impaired by off-ramps locations.	EB and WB off-ramps are isolated and both terminate at Macalla Road. May create driver confusion and some increased potential for wrong-way movements onto the off ramps. EB off-ramp on east side of YBI loops under the Transition Structure farther east than the location of Alternative 1.	EB and WB off-ramps are isolated and each terminates at Macalla Road. The EB off-ramp is shifted further south when compared to Alternatives 1 and 1B. The isolated location of the EB off-ramp may create driver confusion and some increased potential for wrong-way movements onto this off-ramp.	The EB on and off-ramps are hook ramps while the WB on and off-ramps are a loop on-ramp and diamond off-ramp, terminating at Macalla Road. EB hook off-ramp offers a short deceleration length of 120 meters, which is a non standard length. This deceleration length may lead to a higher potential for accidents at this ramp.	Two traffic lanes, merging into one as it connects to SFOBB. One lane would be HOV lane, and one lane would be mixed-flow. EB and WB off-ramps are isolated and both terminate at Macalla Road. Traffic circulation may cause driver confusion and some increased potential for wrong-way movements onto the off ramp. The on ramp would be traffic metered, mitigating the merge related congestion impacts to mainline traffic, minimizing the potential for congested related accidents. Proper pavement markings and directional signage would provide additional guidance, minimizing the potential for wrong way movements.	EB and WB off-ramps eventually both terminate at Macalla Road. May create driver confusion and increased potential for wrong-way movements onto the off-ramps. Eastbound on-ramp would be reconfigured to allow vertical clearance under EB off-ramp. Vehicular traffic would traverse above the 30.5 meter (100-foot) shoreline band and above the S.F. Bay. WB on ramp has an initial radius of 75 meters (250 feet) followed by a radius of 30 meters (100 feet). These decreasing radius curves may not meet driver expectations resulting in a higher potential for accidents.	The WB on and off-ramps are isolated and separate. The location of these separate ramps may lead to driver confusion and a greater chance for wrong way traffic movements onto the WB off ramp.	The WB on and off-ramps are separate. This may cause confusion for drivers regarding location of WB on –ramp.	The WB on and off-ramps are separate but start and end at the same location. This may cause confusion for drivers regarding location of WB on –ramp. The WB on-ramp is a short S-curve with two tight turning radii making acceleration onto the ramp difficult. Tunnels take up a portion of each on and off-ramp on the curved portion reducing the sight distance making it less safe for drivers increasing potential for accidents.
Bridge Structure Area and Material Quantity	11,241.27 square meters (121,000 square feet) Bridge Structure (WB only)	11,984.5 square meters (129,000 square feet) Bridge Structure (WB only)	8,361.27 square meters (90,000 square feet) Bridge Structure (WB only)	7,896.76 square meters (85,000 square feet) Bridge Structure (WB only)	6,317.41 square meters (68,000 square feet) Bridge Structure (WB only)	11,055.46 square meters (119,000 square feet) Bridge Structure (WB only)	12,263.20 square meters (132,000 square feet) Bridge Structure (WB only)	6,410.31 square meters (69,000 square feet) Bridge Structure (WB only) 1,299,743.29 cubic meters (1,700,000 cubic yards) mass excavation tunnel removal	7,246.44 square meters (78,000 square feet) Bridge Structure (WB only) 764,554.86 cubic meters (1,000,000 cubic meters) mass excavation hillside cut and construction of 2 tunnels

Table 2-3: Alternatives Screening Analysis Summary
Yerba Buena Island Ramps EIR/EIS

Screening Level / Criteria	Alternative 1 Nonviable Figure 2-6	Alternative 1A Nonviable Figure 2-7	Alternative 2 Nonviable Figure 2-8	Alternative 2A Nonviable Figure 2-9	Alternative 2B Analyzed in EIR/EIS Figure 2-10	Alternative 3 Nonviable Figure 2-11	Alternative 4 Analyzed in EIR/EIS Figure 2-12	Alternative 5 Nonviable Figure 2-13	Alternative 6 Nonviable 4(f) Avoidance Figure 2-14
Screening Level : Environmental Considerations									
Land Use	Land use of historic district impacted by relocating Quarters 1/Nimitz House. Ramps pass over a portion of the historic district, a planned mix-use area and institutional areas planned for future under TI/YBI Redevelopment. Requires land acquisition and ROW transfer. Structure directly above San Francisco Bay Conservation and Development Commission's (BCDC's) BCDC jurisdictional 30.5 meter (100-foot) band.	Land use of historic district impacted by relocating Quarters 1/Nimitz House Ramps pass over a portion of the historic district, a planned mix-use area and institutional areas planned for future under TI/YBI Redevelopment. Requires land acquisition and ROW transfer. Aerial structure directly above BCDC jurisdictional 30.5 meter (100-foot) band.	Land use impacted where Quarters 10 (and Building 267) would change due to relocation and addition of ramps at Macalla Road grade. Ramps pass over a portion of the historic district, a planned mix-use area, institutional areas and open space land planned for future under TI/YBI Redevelopment.	Land use impacted where Quarters 10 (and Building 267) would change due to relocation and addition of ramps at Macalla Road grade. Ramps pass over a portion of the historic district, a planned mix-use area, institutional areas and open space land planned for future under TI/YBI Redevelopment.	Land use impacted where Quarters 10 (and Building 267) would change due to relocation and addition of ramps at Macalla Road grade. Ramps pass over planned institutional areas and open space land planned for future under TI/YBI Redevelopment.	Land use would change where ramps meet Macalla Road grade. Ramps pass over a portion of the historic district, an area planned for mixed use in future under TI/YBI Redevelopment. However, the ramps would be directly above BCDC jurisdictional 30.5 meter (100-foot) band and the S.F Bay.	Ramps pass over a portion of the historic district and planned mix-use, institutional, and open space areas intended for future use under TI/YBI Redevelopment. In addition, the ramps would be directly above BCDC jurisdictional 30.5 meter (100-foot) band.	Ramps pass over a small portion of the historic district, a planned mix-use, institutional, and open space area for future use under TI/YBI Redevelopment may not be affected; however vertical displacement of landform may cause other issues.	Ramps and a tunnel would be constructed through residential and open space areas planned for future under TI/YBI Redevelopment. Existing structures would be removed and the site would be divided, limiting development potential.
4f : Historic Properties	Elevated EB and WB off-ramps would directly impact and adversely affect two historic properties: (Senior Officers' Quarters Historic District and Quarters 1/Nimitz House). Ramps crossing over two resources would require aerial easements from within properties, and two columns would be located within boundaries. There would be a direct impact to Quarters 1/Nimitz House requiring its removal and relocation. Total area of 4(f) Use – 0.40 hectare (0.98 acre) Aerial easement – 0.15 hectare (0.36 acre)	Elevated WB on and off ramps would directly impact and adversely affect two historic properties: (Senior Officers' Quarters Historic District and Quarters 1/Nimitz House). This alternative eliminates isolated ramps scenario. Ramps crossing over two resources would require aerial easements from within the properties, and two columns would be located within boundaries. Quarters 1 /Nimitz House would be acquired, removed, and relocated. EB off-ramp would disturb archaeologically sensitive area underneath future SFOBB. Total area of 4(f) Use - 0.40 hectare (0.98 acre) Aerial easement – 0.15 hectare (0.36 acre)	Elevated WB on- and off-ramps would directly impact and adversely affect three historic properties (Senior Officers' Quarters Historic District, Quarters 1/Nimitz House, Quarters 10 (and Building 267)). Ramps crossing over first two resources would require aerial easements from within properties, and five columns would be located within boundaries. Quarters 10 (and Building 267) would be acquired, removed, and relocated. Total area of 4(f) Use – 0.59 hectare (1.45 acres) Aerial easement - 0.23 hectare (0.58 acre) Quarters 10: requires relocation (0.18 hectare [0.45 acre])	Elevated WB on- and off-ramps would directly impact and adversely affect three historic properties (Senior Officers' Quarters Historic District, Quarters 1/Nimitz House, Quarters 10 (and Building 267)). Ramps crossing over first two resources would require aerial easements from within properties, and five columns would be located within boundaries. Quarters 10 (and Building 267) would be acquired, removed, and relocated. Total area of 4(f) Use – 0.48 hectare (1.18 acres) Aerial easement – 0.22 hectare (0.54 acre). Quarters 10: requires relocation (0.18 hectare [0.45 acre])	Elevated WB off ramps would directly impact and adversely affect three historic properties: Senior Officers' Quarters Historic District, Quarters 1/Nimitz House, and Quarters 10 (and Building 267); Requires less aerial easements than other alternatives. Ramps crossing over first two resources would require aerial easements from within properties and one column would be located within boundaries. Quarters 10 (and Building 267) would be acquired, removed, and relocated. Total area of 4(f) Use – 0.27 hectare (0.67 acre) Aerial easement – 0.05 hectare (0.13 acre) Quarters 10 (and Building 267) removal (0.18 hectare [0.45 acre])	Elevated WB on- and off-ramps would directly impact and adversely affect two resources: Senior Officers' Quarters Historic District and Quarters 1/Nimitz House. Ramps crossing over two resources would require aerial easements and four columns would be located within boundaries. Quarters 1/Nimitz House, Quarters 10 (and Building 267) would remain in place. The EB off-ramp would disturb archaeologically sensitive area underneath future SFOBB. Total area of 4(f) Use – 0.30 hectare (0.73 acre) Aerial easement – 0.11 hectare (0.28 acre).	Elevated WB on-and off ramps would pass over two historic resources: Senior Officers' Quarters Historic District and Quarters 1/Nimitz House, creating an adverse effect. Ramps would require acquisition of aerial easements over resources and two columns would be located within boundaries of resources. Quarters 1/Nimitz House, Quarters 10 (and Building 267) would remain in place. Total area of 4(f) Use – 0.09 hectare (0.22 acre) Aerial easement – 0.04 hectare (0.11acre).	Elevated WB off-ramp would pass over two historic resources: Senior Officers' Quarters Historic District and Quarters 1/Nimitz House, creating an adverse effect. Ramp would require acquisition of aerial easements from resources and one column would be located within boundaries of resources. Quarters 1/Nimitz House, Quarters 10 (and Building 267) would remain in place. The YBI Tunnel, a significant historic resource, would be impacted and removed for this alternative, creating an adverse effect. Total area of 4(f) Use – (not counting total acreage of tunnel impact) - 0.07 hectare (0.18 acre) Aerial easement – 0.05 hectare (0.12 acre).	Ramps would not physically impact any 4(f) resources. .

Table 2-3: Alternatives Screening Analysis Summary
Yerba Buena Island Ramps EIR/EIS

Screening Level / Criteria	Alternative 1 Nonviable Figure 2-6	Alternative 1A Nonviable Figure 2-7	Alternative 2 Nonviable Figure 2-8	Alternative 2A Nonviable Figure 2-9	Alternative 2B Analyzed in EIR/EIS Figure 2-10	Alternative 3 Nonviable Figure 2-11	Alternative 4 Analyzed in EIR/EIS Figure 2-12	Alternative 5 Nonviable Figure 2-13	Alternative 6 Nonviable 4(f) Avoidance Figure 2-14
Visual	Substantial negative visual changes to setting of the resources, including views to and from resources, as well as the removal of resources. Introduces 22 support columns into the landscape, obstructing views.	Substantial negative visual changes to setting of the resources, including views to and from resources, as well as removal of resources. Introduces 22 support columns into the landscape, obstructing views.	Substantial negative visual changes to setting of the resources, including views to and from resources, as well as removal of resources. Introduces 18 support columns into the landscape, obstructing views.	Substantial negative visual changes to setting of the resources, including views to and from resources, as well as removal of resources. Introduces 18 support columns into the landscape, obstructing views.	Substantial negative visual changes to setting of the resources, including views to and from resources, as well as removal of resources. Introduces 13 support columns into the landscape, obstructing views.	Substantial negative visual changes to setting of the resources, including views to and from resources. Introduces 23 support columns into the landscape, obstructing views. Visual effect of the ramp and support columns along the S.F Bay edge is adverse.	Substantial negative visual changes to setting of the resources, including views to and from resources. Introduces 23 support columns into the landscape, obstructing views.	Substantial negative visual changes to setting of the resources, including views to and from resources, as well as removal of one resource. Introduces ten support columns into the landscape, obstructing views. Removes the YBI tunnel and much of the land above and adjacent for construction, creating a major visual impact to the island.	Negative visual changes to the setting around the 4f resources, including views to and from resources. Introduces seven support columns into the landscape, obstructing views. The ramp and tunnels would drastically alter the appearance of the hillside, including the removal of buildings.
Noise	Construction impacts for limited time to noise. Some minor change in operational noise anticipated due to location through the site.	Construction impacts for limited time to noise. Some minor change in operational noise anticipated due to location through the site.	Construction impacts for limited time to noise. Operational noise changes anticipated due to location through the site. More cars would be queuing on the ramps adding more noise.	Construction impacts for limited time to noise. Operational noise changes anticipated due to location through the site. More cars would be queuing on the ramps adding more noise.	Construction impacts for limited time to noise. Minimal change in operational noise anticipated, 0-1 dBA Leq modeled noise increase at receivers	Noise construction impacts anticipated to take longer compared to other alternatives. Operational noise changes anticipated due to location through the site. More cars would be queuing on the ramps adding more noise.	Construction impacts for limited time to noise. Minimal change in operational noise anticipated, 0-1 dBA Leq modeled noise increase at receivers.	Construction noise impacts are anticipated to last longer compared to other alternatives. Change in operational noise anticipated due to opening of tunnel which would add more traffic noise.	Construction noise impacts are anticipated to take longer compared to other alternatives due to the amount of excavation and construction material required. Change in operational noise changes anticipated due to location through the site and addition of two tunnels.
Air Quality	Construction impacts for limited time. No change in operational air quality anticipated.	Construction impacts for limited time. No change in operational air quality anticipated.	Construction impacts for limited time. Operational air quality changes anticipated due to location through the site. More cars would be queuing on the ramps adding more emissions.	Construction impacts for limited time. Operational air quality changes anticipated due to location through the site. More cars would be queuing on the ramps adding more emissions.	Construction impacts for limited time. No change in operational air quality anticipated.	Air quality construction impacts expected to last longer than other alternatives. Operational air quality changes anticipated due to location through the site. More cars would be queuing on the ramps adding more emissions.	Construction impacts for limited time. No change in operational air quality anticipated.	Air quality construction impacts expected to last longer than other alternatives. Change in operational air quality anticipated due to the effects of design change, however levels difficult to predict.	Air quality construction impacts expected to last longer than other alternatives. Operational air quality changes anticipated due to location through the site and design change with addition of two tunnels.
Biological Resources	Potential impacts on biological resources north of I-80 within shoreline band, adjacent to S.F.Bay.	Potential impacts on biological resources north of I-80 within shoreline band, adjacent to S.F.Bay.	Limited impacts on biological resources north of I-80 due to ramp location through vegetated communities.	Limited impacts on biological resources north of I-80 due to ramp location through vegetated communities.	Impacts on biological resources north of I-80 confined to limited area due to ramp design.	Potential adverse impacts on biological resources north of I-80, including the S.F.Bay.	Potential impacts on biological resources north of I-80 within shoreline band, adjacent to S.F.Bay.	Potential impacts on biological resources north of I-80 and above the tunnel due to extensive excavation.	Potential impacts on biological resources north of I-80 due to extensive excavation of hillside.
Stakeholder Considerations:									
BCDC – Public Access (Bay Trail)	Encroaches onto BCDC's 30.5 meter (100-foot) shoreline band, creating additional environmental concerns.	Encroaches onto BCDC's 30.5 meter (100-foot) shoreline band, creating additional environmental concerns.	Limited encroachment onto BCDC's 30.5 meter (100-foot) shoreline band.	Limited encroachment onto BCDC's 30.5 meter (100-foot) shoreline band.	No encroachment onto BCDC's 30.5 meter (100-foot) shoreline band.	Encroaches onto BCDC's 100-foot shoreline band and into the S.F. Bay, creating major environmental concerns.	Encroaches onto BCDC's 100-foot shoreline band, creating additional environmental concerns.	Limited encroachment onto BCDC's 30.5 meter (100-foot) shoreline band.	No encroachment onto BCDC's 30.5 meter (100-foot) shoreline band.

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Yerba Buena Island Ramps EIR/EIS

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Community Considerations (Including Island Users)	Interruption to access conditions and noise during construction. Permanent impact of aerial structure above 30.5 meter (100-foot) shoreline band.	Interruption to access conditions and noise during construction. Permanent impact of aerial structure above 30.5 meter (100-foot) shoreline band.	Interruption to access conditions and noise during construction.	Interruption to access conditions and noise during construction.	Interruption to access conditions and noise during construction.	Interruption to access conditions and noise during construction. Permanent impact of aerial structure above 30.5 meter (100-foot) shoreline band and S.F. Bay.	Interruption to access conditions and noise during construction. Permanent impact of aerial structure above 30.5 meter (100-foot) shoreline band.	Interruption to access conditions and noise during construction. Change to historic tunnel and alteration of hillside appearance.	Interruption to access conditions and noise during construction. Alteration of hillside land use divides site, limiting future develpment.
Construction Considerations:									
Project Duration	4 years	4 years	4 years	3.5 years	3 years	5 years	3.5 years	5 years	5 years
Operation Impacts During Construction	Access rerouted. Delays anticipated. WB on-ramp traffic would be detoured to other on-ramp on west side of YBI tunnel via Treasure Island Road. Traffic at Macalla Rd would be restricted to one lane during paving operations. Falsework erection would also cause brief roadway closures. Nelly Avenue would be impacted during construction of the WB on-ramp. Access to the Coast Guard facility would be rerouted during this construction. Access to Quarters 1/ Nimitz House would be restricted during construction of the WB off-ramp.	Access rerouted. Delays anticipated. WB on-ramp traffic would be detoured to other on-ramp on west side of YBI tunnel via Treasure Island Road. Traffic at Macalla Rd would be restricted to one lane during paving operations. Falsework erection would also cause brief roadway closures. Neally Avenue would be impacted during construction of the WB on-ramp. Access to the Coast Guard facility would be rerouted during this construction. Access to Quarters 1/ Nimitz House would be restricted during construction of the WB off-ramp.	Access rerouted. Delays anticipated. WB on-ramp traffic would be detoured to other on-ramp on west side of YBI tunnel via Treasure Island Road. Traffic at Macalla Rd would be restricted to one lane during paving operations. Falsework erection would also cause brief roadway closures. Access to buildings NW of Quarters 1/Nimitz House, within the Officers' Quarters Historic District would be restricted during construction of the WB off-ramp and WB on-ramp.	Access rerouted. Delays anticipated. WB on-ramp traffic would be detoured to other on-ramp on west side of YBI tunnel via Treasure Island Road. Traffic at Macalla Rd would be restricted to one lane during paving operations. Falsework erection would also cause brief roadway closures. Access to buildings NW of Quarters 1/ Nimitz House, within the Officers' Quarters Historic District would be restricted during construction of the WB off-ramp and WB on-ramp.	Access rerouted. Delays anticipated. WB on-ramp traffic would be detoured to other on-ramp on west side of YBI tunnel via Treasure Island Road. Macalla Rd. would be restricted to one lane operation during retaining wall construction, bridge foundation construction and paving operations.	Access rerouted. Delays anticipated. Macalla Rd. would be restricted to one way traffic during paving operations. WB on-ramp traffic would be detoured to other on-ramp on west side of YBI tunnel via Treasure Island. Access to North Gate Road would incur short term restrictions during erection of falsework.	Access rerouted. Delays anticipated. WB on-ramp traffic would be detoured to other on-ramp on west side of YBI tunnel via Treasure Island Road. WB on-ramp traffic would be detoured to other on-ramp on west side of YBI tunnel via Treasure Island.	Access rerouted. Major delays anticipated for a longer period. Mainline traffic would be rerouted during demolition of the historic YBI tunnel. Macalla Rd. would be restricted to one way operation during paving. WB on-ramp traffic would be detoured to the other on-ramp on west side of Yerba Buena Island via Treasure Island.	Access rerouted. Major delays anticipated for a longer period Macalla Road would be restricted to one-way traffic during construction and paving operations. WB on-ramp traffic would be detoured to the other on-ramp on west side of Yerba Buena Island via Treasure Island.
Phasing/Staging	Construction of EB and WB off-ramps adjacent to Quarters 1/Nimitz House would require specific staging and coordination to minimize impacts. WB on-ramp and off-ramps encroach into 100-foot shore line band, requiring specific coordination.	Construction of EB and WB off-ramps adjacent to Quarters 1/Nimitz House would require specific staging and coordination to minimize impacts. WB on-ramp and off-ramps encroach into 100-foot shore line band, requiring specific coordination.	Construction of EB off-ramps adjacent to Quarters 1/Nimitz House would require specific staging and coordination to minimize impacts. WB on-ramp and off-ramps near the 100-foot shore line band, requiring BCDC coordination. Additional staging areas required for more complex construction undertaking around the historic district.	Construction of WB off-ramps thru the Senior Officers' Quarters Historic District would require specific staging and coordination to minimize impacts. WB off-ramps near 100-foot shore line band, requiring BCDC coordination. Additional staging areas required for more complex construction undertaking around the historic district.	Construction of WB off-ramp adjacent to the Senior Officers' Quarters Historic District would require specific coordination. Phasing challenges from detour to other on-ramp on west side of YBI tunnel, described above. 100 foot shoreline band is avoided.	Additional staging areas required for more complex construction undertaking through the Senior Officers' Quarters Historic District and into the S.F. Bay. More time needed to phase work to minimize restrictions. WB on and off-ramps encroach onto 100 foot shoreline band.	Phasing challenges from detour to other on-ramp on west side of historic YBI tunnel, described above. Extensive bridge construction in close proximity to transition structure and Coast Guard facility would require additional staging areas.	Additional staging areas required for more complex construction undertaking. Historic YBI Tunnel demolition would require extensive detour planning. Removal of tunnel material would require more onsite staging areas. More time needed to phase work to minimize restrictions on access and ramp operations.	Additional staging areas required for more complex construction undertaking. Side hill excavation and tunnel construction would require more stockpiling areas anexport of material. More time needed to phase work to minimize restrictions on access and ramp operations.

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Constructability	Standard roadway construction, however building the ramps to minimize impact on the surrounding historic resources would be difficult. Challenge of constructing in soft soil near S.F. Bay edge. May require offshore access.	Standard roadway construction, however building the ramps to minimize impact on the surrounding historic resources would be difficult. Challenge of constructing in soft soil near S.F. Bay edge. May require offshore access.	Standard roadway construction, however construction would be more challenging around the multiple historic resources.	Standard roadway construction, however construction would be more challenging around the multiple historic resources.	Standard roadway construction. Removal and relocation of the buildings would make construction easier. Limited area impacted by construction because of design.	Standard roadway construction, however challenging construction of twenty-three support columns and superstructure around historic district and in offshore location above the S.F. Bay.	Standard roadway construction, however challenge of constructing twenty-three support columns including in soft soil near S.F. Bay edge.	Unique roadway construction required to remove existing tunnel. Major excavation required and integration with Bay Bridge design would be challenging.	Roadway construction required through steep hillside with two new tunnels and major excavation. Tunnels would be curved and complicated to construct as curved structures, further complicating the T Integration with Bay Bridge design challenging.
Screening Level Analysis: Right of Way Impacts and Feasible Financial Cost									
USCG Right of Way Impacts (East Side)	1.99 hectares (4.92 acres)	1.99 hectares (4.92 acres)	0.94 hectares (2.33 acres)	No USCG Right of Way Impacts	No USCG Right of Way Impacts	1.21 hectares (2.98 acres)	0.92 hectare (2.28 acres)	0.62 hectare (1.53 acres)	No USCG Right of Way Impacts
Estimated Initial Cost[1]	$100 million	$ 135 million	$ 95 million	$ 70 million	$60 million	$100 million	$125 million	$680 million Substantially higher cost	$770 million Substantially higher cost
Retain for Analysis in EIR/EIS? (Yes or No)	No	No	No	No	Yes	No	Yes	No	No

Note: 1. AECOM Transportation, 2010

Green = Low **Yellow = Medium** **Red = High**

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TSM AND TDM

In addition to the build alternatives, transportation projects often explore alternatives to further increase operational efficiency to the existing road network and configuration or manage the demand. These techniques can be cost effective and environmentally friendly when they enable efficient use of available resources and when safety is not a factor. The goal is still the same to reduce congestion and enable existing and future capacity to be accommodated through the implementation of the Project.

The two most common methods to manage the demand include Transportation Systems Management (TSM) and Transportation Demand and Management (TDM) techniques. TSM techniques support making existing transportation systems operate in a more efficient manner. Typical techniques include improved traveler information, signal system coordination and improved response time to incidents. TDM techniques support a reduction in the number of vehicles using the transportation system. Typical techniques may include fringe parking with shuttle busses, encouraging transit oriented development, pricing strategies for parking, and ridesharing. Improvement of pedestrian and bicycle access, and transit services are also demand management techniques. Neither TSM nor TDM techniques work as a stand-alone alternative. They would not solve the problem that the ramps do not meet current standards and does not resolve the need to improve the geometry of the existing ramps to improve circulation and safety.

TSM and TDM are discussed further in Section 3.6, Traffic and Transportation/ Pedestrian and Bicycle Facilities.

Future traffic demand volumes for the TI project and the SFOBB were estimated using two different methods and then integrated to ensure consistency. Future demand volumes for the proposed TI project were estimated based on the full build-out of the TI/YBI Redevelopment Project without enhanced TDM measures or transit service improvements. The demand analysis also does not consider any of the constraining effects of the ramp metering. The redevelopment project proposes a number of TDM measures (including congestion pricing, residential transit subsidies, bicycle sharing, etc.) and a high level of transit service during peak hours, including:

- New ferry service to San Francisco every 10 minutes,
- New bus service to Downtown Oakland every 7 minutes,
- Maintenance of existing bus service to the San Francisco Transbay Terminal (Muni Route 108-Treasure Island) every 5 minutes, and
- New bus service to the San Francisco Civic Center area every 12 minutes.

This level of mass transit services and TDM measures is expected to result in a substantial shift from automobile transit to use of the new mass transit services. However, funding and/or operating details for all of this service has not yet been resolved. Therefore, the transportation analysis for the YBI Ramps Improvement Project is based on a scenario with limited TDM measures (no congestion pricing, for example) and the following reduced transit service assumptions:

- New ferry service to San Francisco every 50 minutes,

- New bus service to downtown Oakland every 7 minutes,
- Maintenance of the existing bus service to the San Francisco Transbay Terminal (Muni Route 108-Treasure Island) every 15 minutes, and
- No new bus service to the San Francisco Civic Center area.

As a result, this analysis is based on the assumption of substantially reduced mass transit services, from what is ultimately proposed by the full TI project with TDM measures. Therefore this analysis represents a conservative worst-case scenario in terms of peak hour vehicle trips using the proposed ramps.

2.5.2 Nonviable Build Alternatives

A summary of the Alternatives considered and eliminated are included in the Alternatives Screening Analysis Table 2-3 which is a matrix that was used to guide the decision process for selecting the Alternatives, 2b and 4, which were carried through the EIR/EIS analysis. A drawing of each nonviable alternative is provided in Figures 2-5 through 2-13, at the end of this section. The future proposed land use for the TI and YBI Redevelopment and existing historic resources are included on the figures. The screening levels included a review of the Purpose and Need, engineering considerations, environmental considerations, stakeholder considerations, construction considerations, right-of-way impacts and feasible financial cost. As mentioned above a brief summary of environmental effects of each alternative is included in Table 2-3 along with a color coded ranking of green=low, yellow=medium and red=high. A synopsis of the non-viable alternatives and some of the primary reasons they were eliminated is described below.

Alternative 1 (Figure 2-6) was removed from consideration for the following reasons:

Engineering: The ramps require reduced stopping sight distance and design speeds. The access and circulation contains potentially confusing driver situations at the entrances and exits to the ramp that could result in potential wrong-way movements.

Environmental: The off-ramps would adversely affect the historic Nimitz House, a Section 4(f) resource, and affecting the larger historic district. Aerial structure of the ramp would be located within the San Francisco Bay Conservation and Development Commission's (BCDC's) 30.5 meter (100-foot) shoreline band. Structure would require approximately 22 support columns which would intrude into the landscape and obstruct views. Three of the support columns would be within the Senior Officers' Quarters Historic District. Minor changes in operational noise levels would be anticipated.

Construction: Operational impacts would be expected including rerouting access, reduction in lanes and road closures, causing delays. Offshore access may be required to construct in soft soils at the San Francisco Bay edge.

Right-of-Way and Cost: Requires the largest acquisition of USCG property to construct the westbound on-ramp. Cost is nearly double Alternative 2B.

Alternative 1A (Figure 2-7) – Similar to Alternative 1, this Alternative was removed for the following reasons:

Engineering: The ramps require reduced stopping sight distance and design speeds. The access and circulation contains potentially confusing driver situations at the entrances and exits to the ramp that could result in potential wrong-way movements.

Environmental: The east bound off-ramp would adversely affect and disturb the archaeologically sensitive area underneath the future SFOBB. The aerial structure of the ramp would affect the visual integrity of historic district and a portion would be located within the BCDC's 30.5 meter (100-foot) shoreline band. The structure would require approximately 22 support columns which would intrude into the landscape and obstruct views. Three of the support columns would be within the Senior Officers' Quarters Historic District. Minor changes in operational noise levels are anticipated.

Construction: Operational impacts would be expected including rerouting access, reduction in lanes and road closures, thereby causing delays. Offshore access may be required to construct in soft soils at the San Francisco Bay edge.

Right-of-Way and Cost: Requires the largest acquisition of USCG property to construct the westbound on-ramp. Cost is more than double Alternative 2B.

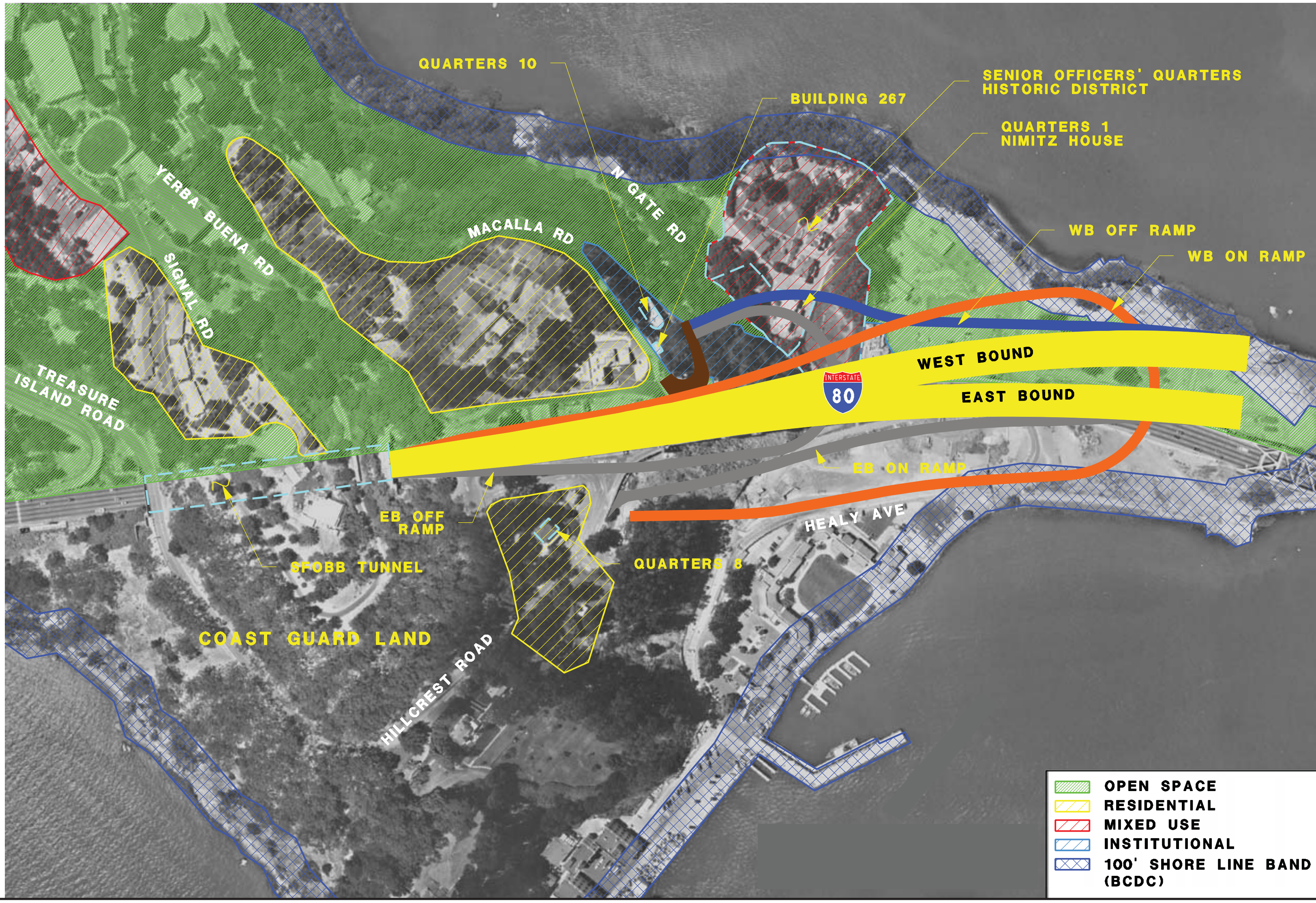
Alternative 2 (Figure 2-8) – This alternative is similar to Alternative 1A and was removed for the following reasons:

Engineering: The ramps require reduced stopping sight distance and design speeds than Alternatives 1 and 1A. The access and circulation contains potentially confusing driver situations at the entrances and exits to the ramp that could result in potential wrong-way movements.

Environmental: Aerial structure of the ramp passes above historic district affecting the visual integrity. Structure would require approximately 18 support columns which would intrude into the landscape and obstruct views. Five of the support columns would be within the Senior Officers' Quarters Historic District. Additional operational noise and air quality emissions may be present from vehicles traveling further into the site.

Construction: Operational impacts would be expected including rerouting access, reduction in lanes and road closures, causing delays. Constructing through the historic district requires complex phasing and staging.

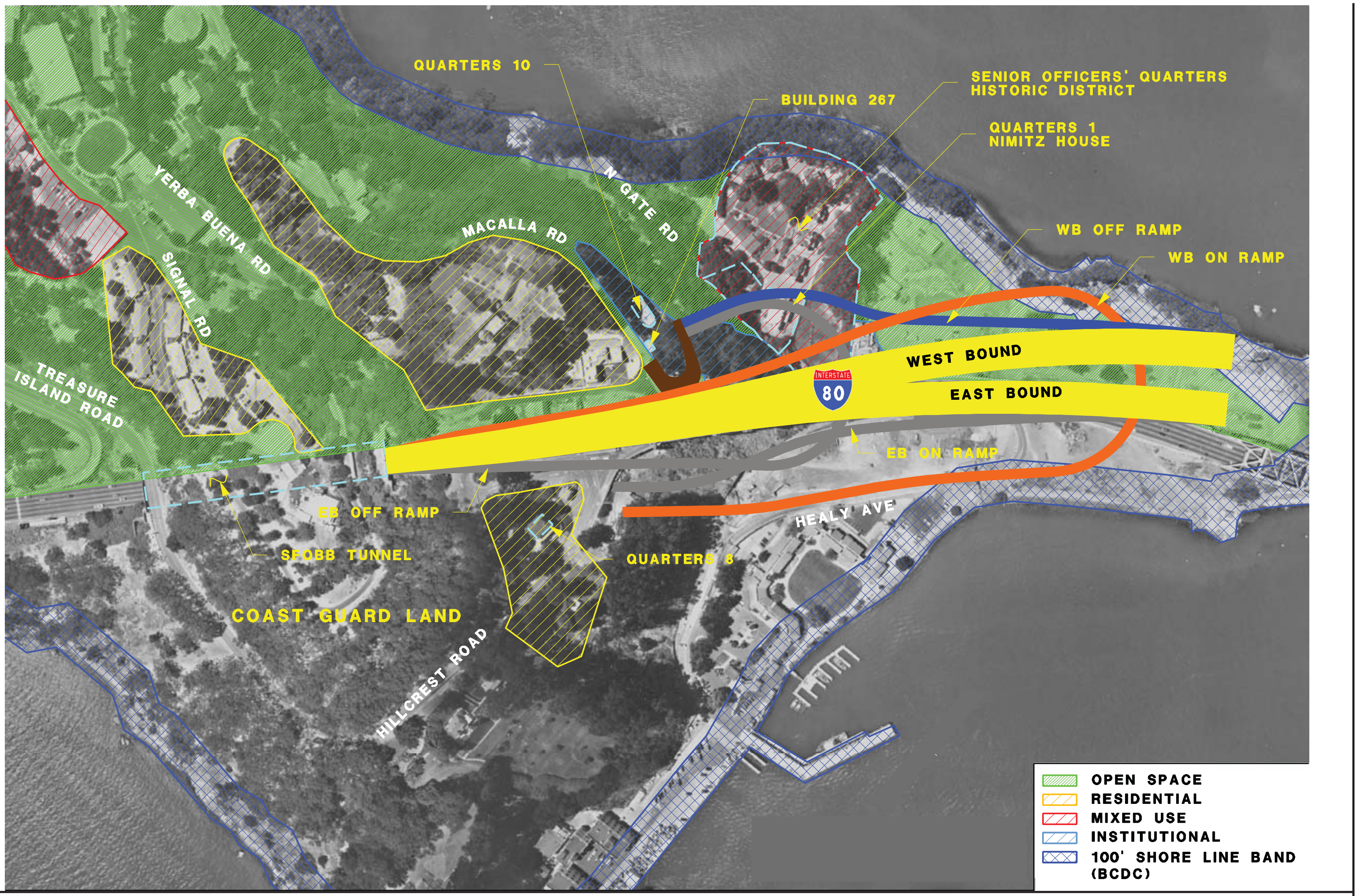
Right-of-Way and Cost: Requires additional right-of-way north of the existing SFOBB mainline and aerial easement for eastbound off-ramp. Cost is nearly double Alternative 2B.



Source: AECOM Transportation 2010

Not to Scale

Figure 2-6
Yerba Buena Island Ramps Alternative 1



Source: AECOM Transportation 2010

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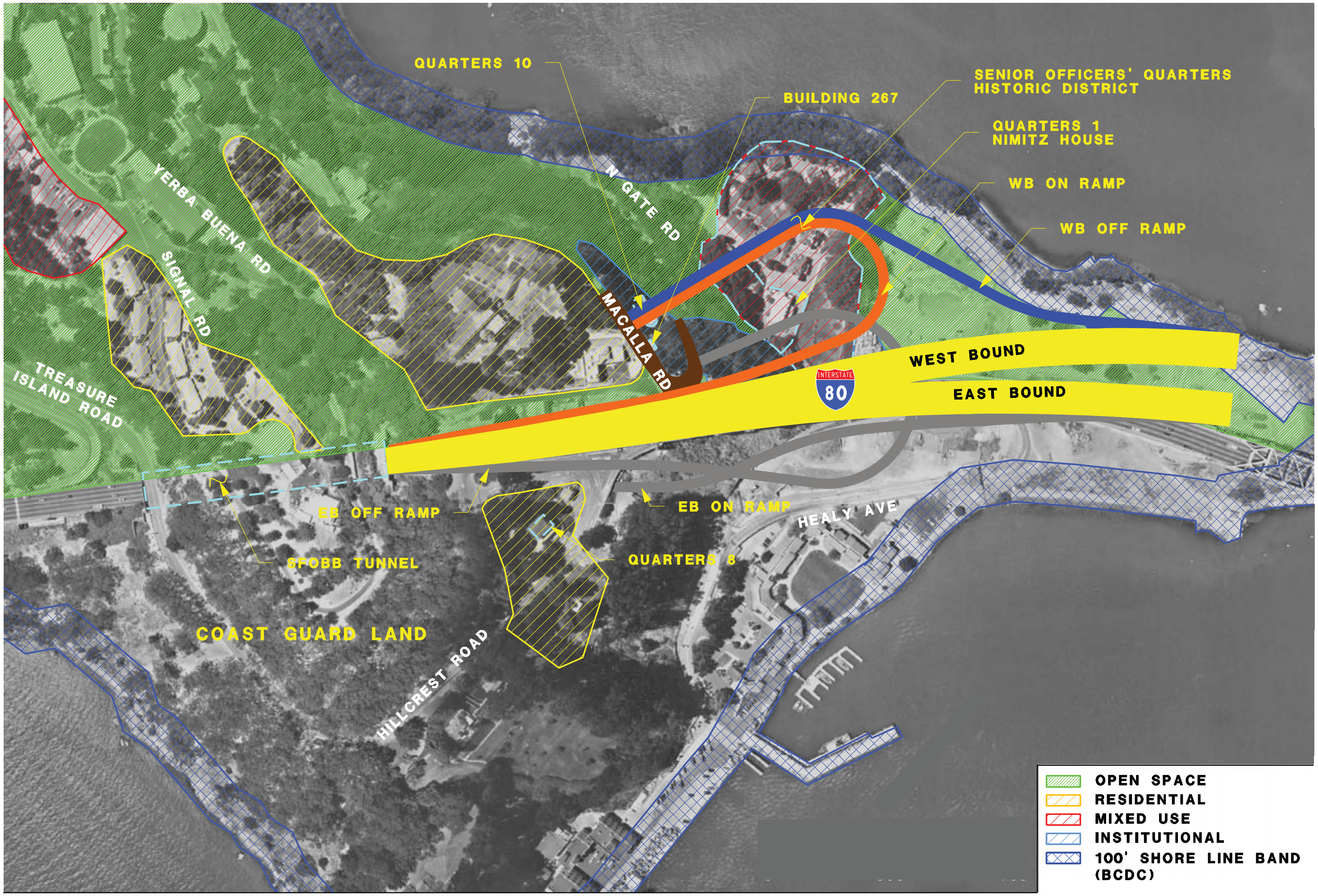
Figure 2-7
Yerba Buena Island Ramps Alternative 1A



Source: AECOM Transportation 2010

Not to Scale

Figure 2-8
Yerba Buena Island Ramps Alternative 2

Alternative 2A (Figure 2-9) – This alternative is similar to Alternative 2 and was eliminated for the following reasons:

Engineering: The ramps require reduced stopping sight distance and design speeds compared to Alternatives 1 and 1A. The eastbound hook ramp has a short, nonstandard length which has a higher potential for accidents.

Environmental: Aerial structure of the ramp passes above historic district affecting its visual integrity. Structure would require approximately 18 support columns which would intrude into the landscape and obstruct views. Five of the support columns would be within the Senior Officers' Quarters Historic District. Additional operational noise and air quality emissions may be present from vehicles traveling further into the site.

Construction: Operational impacts would be expected including rerouting access, reduction in lanes and road closures, causing delays. Constructing through the historic district requires complex phasing and staging.

Alternative 3 (Figure 2-11) – Similar to Alternative 2, this Alternative was eliminated for the following reasons:

Engineering: The ramps require reduced stopping sight distance and design speeds than Alternatives 1 and 1A. The access and circulation contains decrease radius curves that could create driver difficulty resulting in potential for accidents.

Environmental: Aerial structure of the ramp passes above the historic district affecting its visual integrity. The structure would require approximately 23 support columns which would intrude into the landscape and obstruct views. Four of the support columns would be within the Senior Officers' Quarters Historic District. Eastbound on-ramp would encroach into an archaeologically sensitive area. Ramp passes over San Francisco Bay with more potential to adversely impact biological resources Additional operational noise and air quality emissions may be present from vehicles traveling further into the site.

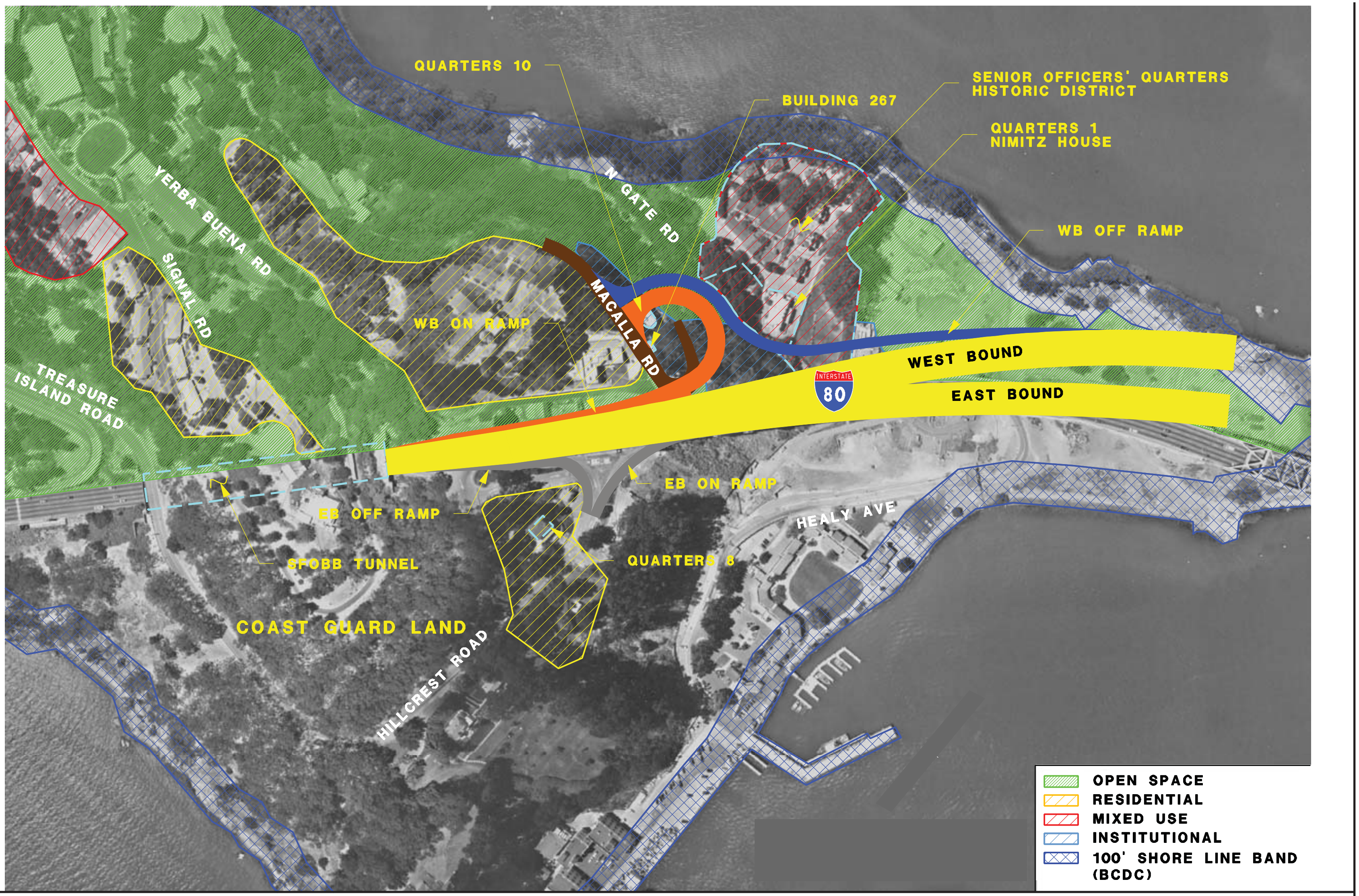
Construction: Operational impacts would be expected including rerouting access, reduction in lanes and road closures, causing delays. Constructing over the San Francisco Bay, the 100-foot shoreline band and around the historic district requires very complex phasing and staging.

Right-of-Way and Cost: Requires additional right-of-way north of the existing SFOBB mainline and aerial easement for off-ramp. Cost is nearly double Alternative 2B.

Source: AECOM Transportation 2010

Not to Scale

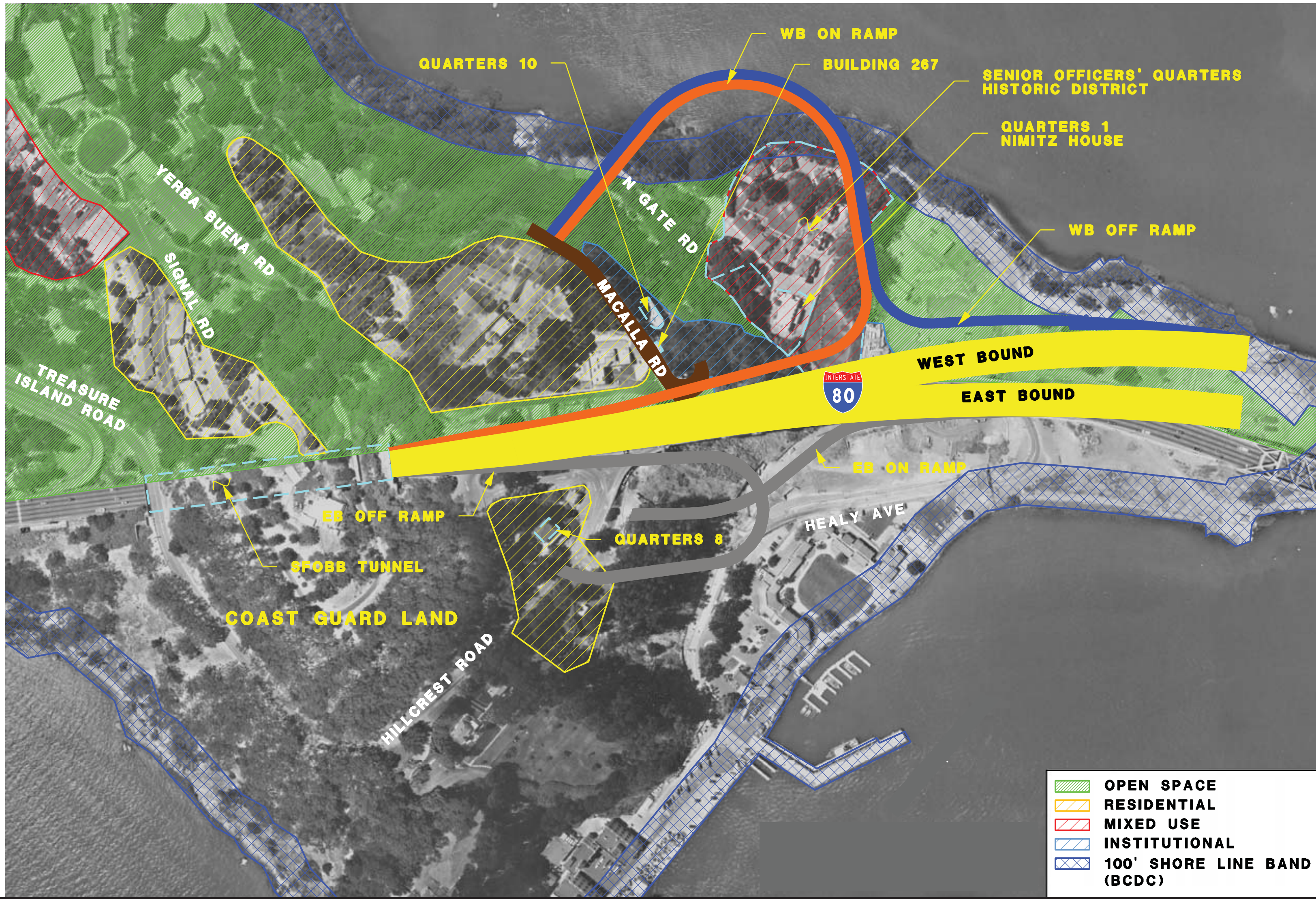
Figure 2-9
Yerba Buena Island Ramps Alternative 2A



Source: AECOM Transportation 2010

Not to Scale

Figure 2-10
Yerba Buena Island Ramps Alternative 2B



Source: AECOM Transportation 2010

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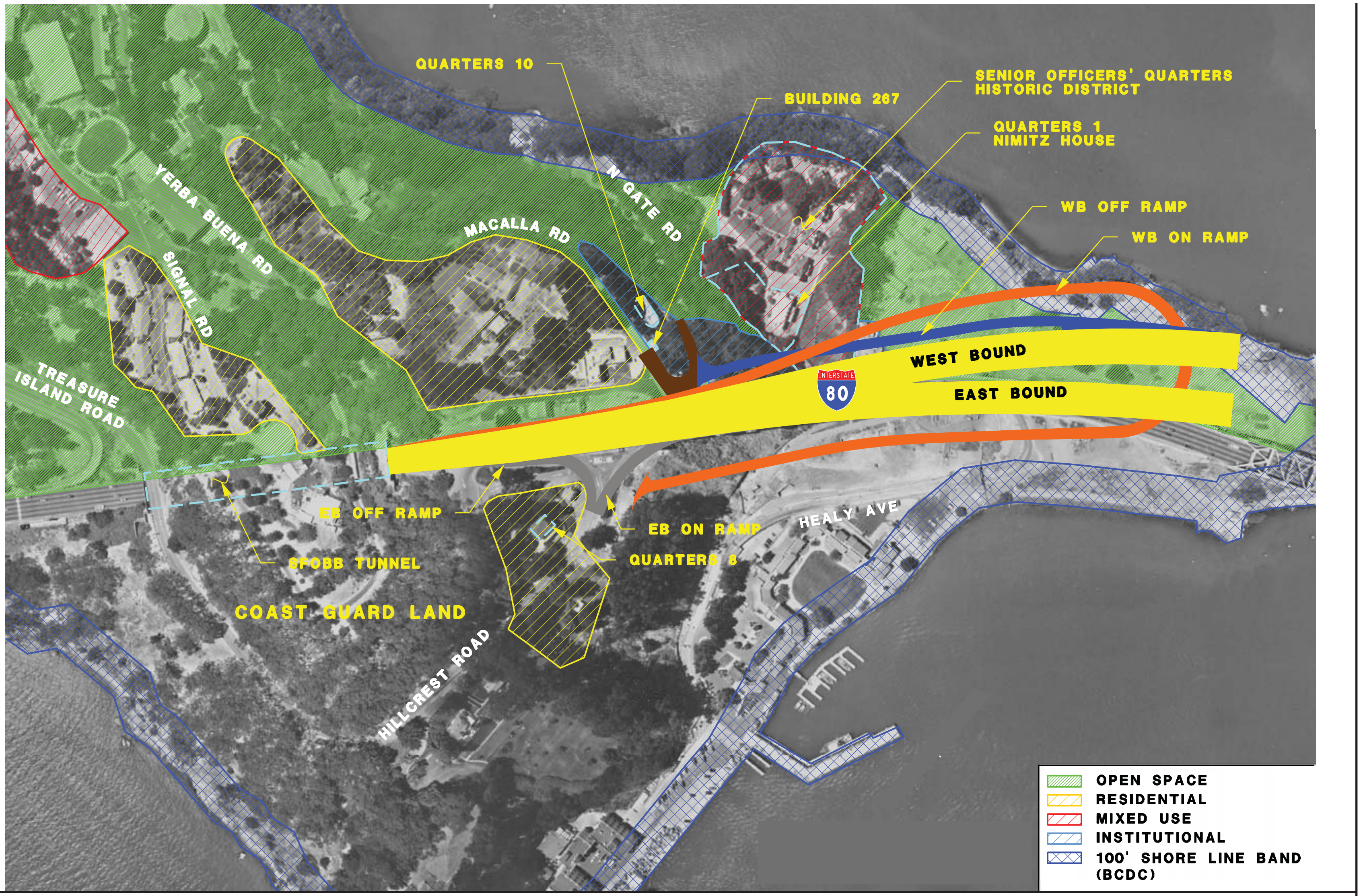
Figure 2-11
Yerba Buena Island Ramps Alternative 3



Source: AECOM Transportation 2010

Not to Scale

Figure 2-12
Yerba Buena Island Ramps Alternative 4

Alternative 5 (Figure 2-13)–This Alternative was eliminated for the following reasons:

Engineering: Elimination of the tunnel and retention of the double deck viaduct would require additional seismic tie-in considerations. Widening of the historic YBI tunnel, and relocation of structures would require excavating and daylighting the existing YBI tunnel, a historic 4(f) resource. The bridge connecting Hillcrest Drive to TI located on east side of YBI would have to be replaced. The WB on and off-ramps are separate and may cause confusion for drivers.

Environmental: Aerial structure of the ramp passes above the historic district impacting a 4(f) resource. Structure would require approximately 10 support columns which would intrude into the landscape and obstruct views. One of the support columns would be within the Senior Officers' Quarters Historic District. Modification of hillside and alteration to historic tunnel will be an impact to a historic 4(f) resource. Challenging visual impacts to tie into bridge structure.

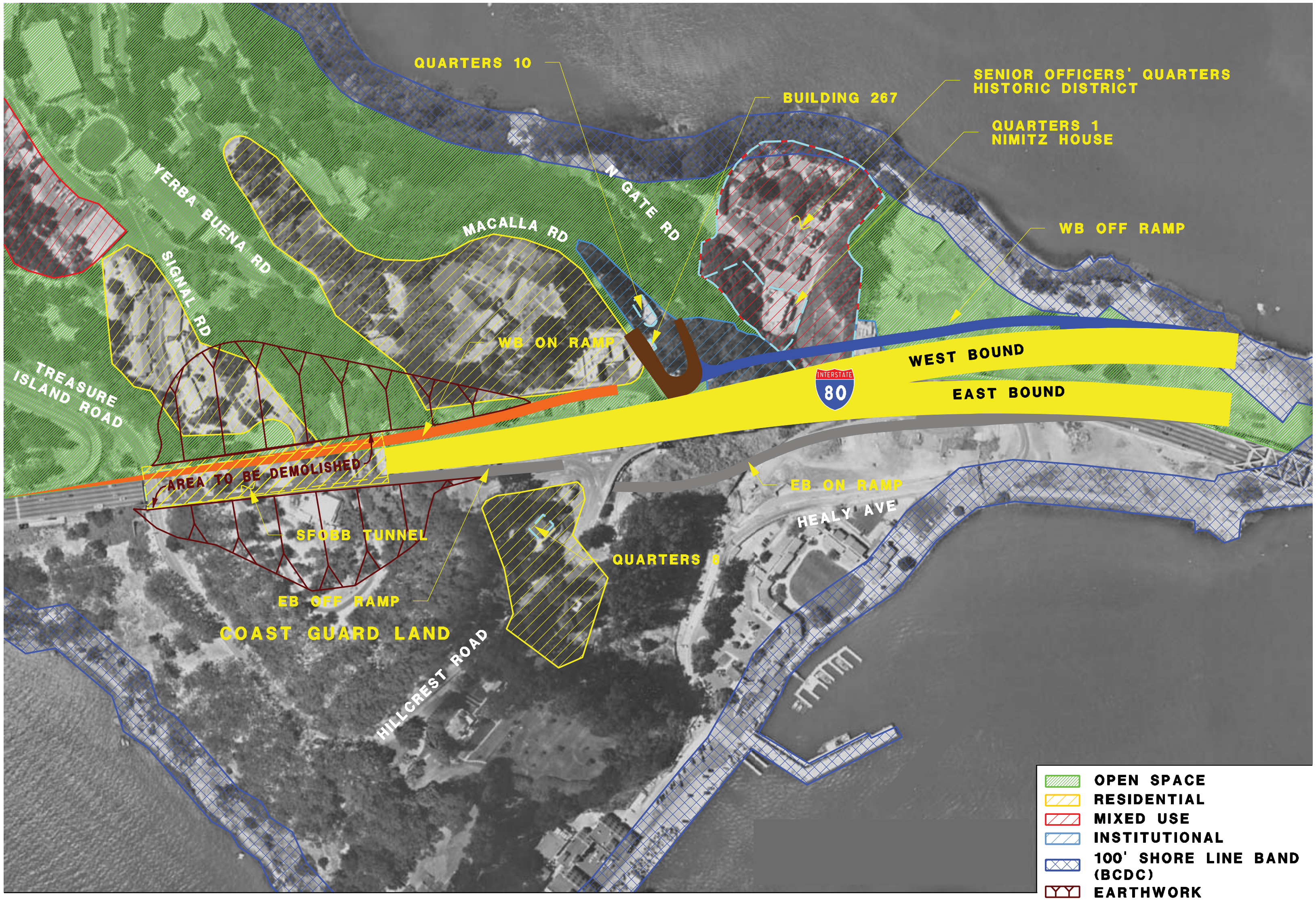
Construction: Construction period would take longer than other alternatives due to complex tie into bridge. Major delays expected due to amount of excavation and alteration to the tunnel.

Right-of-Way and Cost: Requires additional right-of-way north of the existing SFOBB mainline and aerial easement for off-ramp. Cost is nearly fourteen times as much as Alternative 2B and is not feasible and prudent due to the impacts described above and cost is estimated at $680 million, which is substantially higher than the estimated costs for the other build alternatives.

Alternative 6 – Avoidance (Figure 2-14) This Alternative was eliminated for the following reasons:

Engineering: This alternative would require construction of westbound on and off-ramps that would dramatically alter the hillside and effect future development proposed for residential use by the TI/YBI Redevelopment Project. More importantly the design has a number of geometry and resulting safety issues. The westbound off-ramp would start its descent after passing over the Historic District boundary and would require a steep grade ranging from 10-16 percent which is over the standard maximum of 8 percent. This would require a lower design speed down to 24.1-32.2 km/h (15-20 mph) on the approach to Macalla Road, due to a non-standard deceleration length of 61 meters (200 feet). The other non-standard feature of the off-ramp would include a reduced horizontal sight distance before the Macalla Road approach. The divergence angle for the ramp would be 1.5 times greater than the standard in 504.2B of the HDM criteria. The westbound on-ramp would have an S-curve which is an undesirable geometry with a reduced length and tight turning radius. The horizontal curve radius requires slowing to 24.1-32.2 km/h (15-20 mph) maximum speed and there would be a short merge onto the main lanes of the SFOBB. An abrupt departure angle would be needed so the westbound off-ramp could gain enough separation from the mainline to reach the elevation and climb of the entrance ramp tunnel. The reduction in length to less than 30 percent of the standard would require drivers to merge quickly onto the mainline freeway, similar to the existing ramp condition. The available space only allows for a transition ratio of 10:1, in contrast to the design standard minimum ratio of 50:1. Macalla Road would require widening the road to allow for two full lanes, the introduction of a traffic signal, as well as the removal of building 53 to make room for the interchange termini.

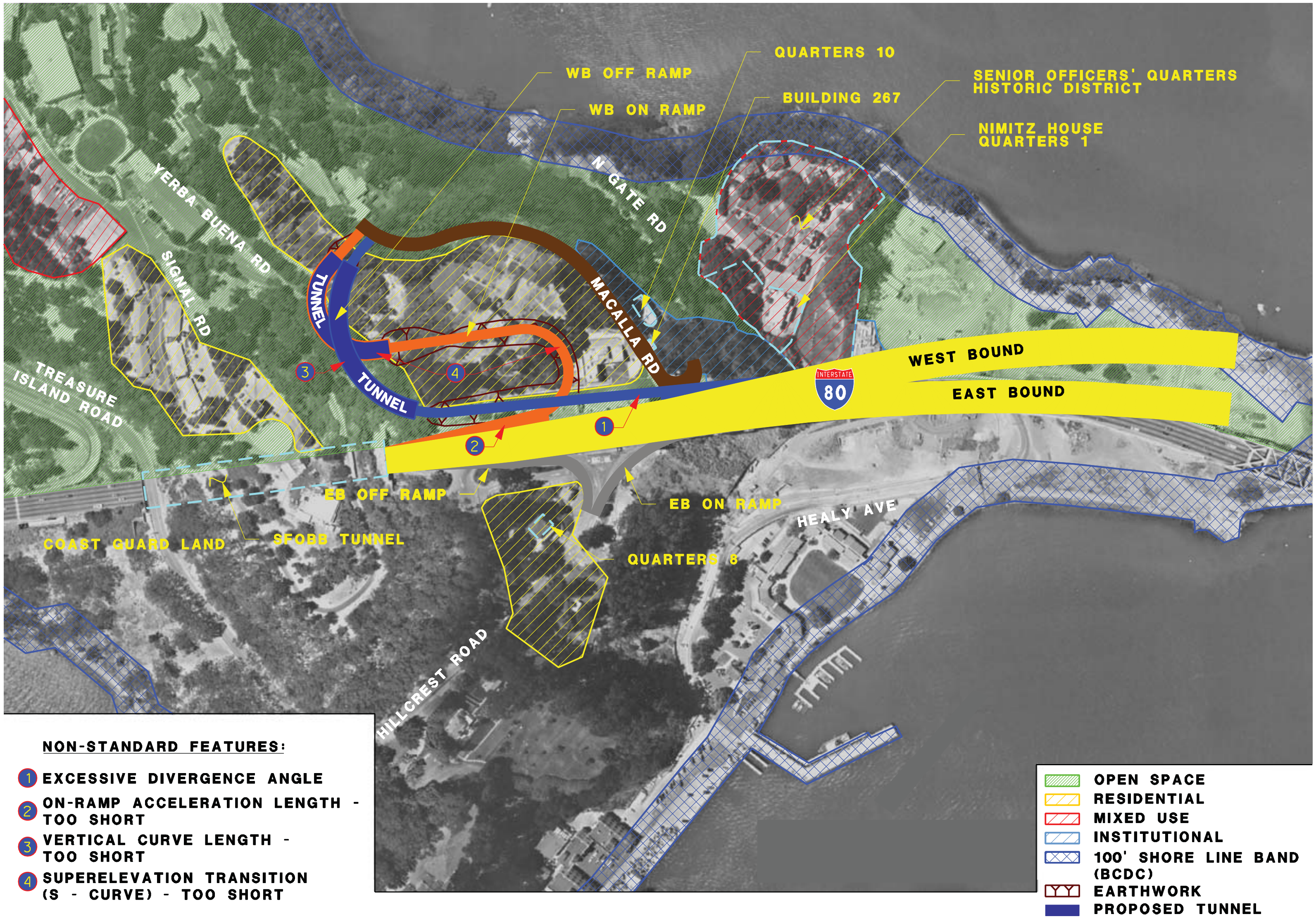
P:\2008\08080090 Yerba Buena Island Interchange\5.0 Graphics (Non-CAD)\5.7 Report Graphics\Figures\Figure 2-13 alt5.ai dbrady 7/6/10



Source: AECOM Transportation 2010

Not to Scale

Figure 2-13
Yerba Buena Island Ramps Alternative 5



Source: AECOM Transportation 2010

Not to Scale

Figure 2-14
Yerba Buena Island Ramps Alternative 6

Environmental: The aerial structure of the westbound off-ramp would start right after passing above the historic district and would therefore not impact any 4(f) resource. Seven support columns would be required to support the structure which would intrude into the landscape and obstruct views; however none would be located within a 4(f) resource. This alternative proposes westbound on and off-ramps that would divide the site, require removal of existing buildings and limit proposed land uses planned for future residential development. Potential visual impacts would also result from the tie-in connection with the design of the bridge structure.

Construction: Construction period would take longer than other alternatives due to complex excavation, amount of material and challenging construction techniques that would be required to build two new tunnels into steep hillside and the tie into new bridge structure which would cause major delays.

Right-of-Way and Cost: Cost is nearly thirteen times greater than Alternative 2b and is not viable due to the impacts described above and cost is estimated to be $770 million dollars. The cost estimate comparison to other alternatives can be referenced in Table 2-3 of the EIR/EIS.

2.6 Permits or Consistency Determinations Needed

Collaborative efforts have taken place throughout the planning process with key agency representatives from as early as 2002 when the initial conceptual alternatives were presented until recently when the alternatives were further refined. Coordination on potential key environmental issues has occurred including Section 4(f) historic properties with SHPO, and waters of the U.S. with USACE. On-going coordination has occurred with the CCSF, TIDA and the USCG to ensure construction and operation of the project would not conflict with existing use and future plans.

Permit and consistency determinations that would be required for project construction are listed below in Table 2-4.

Table 2-4: Permits and Approvals Needed

Approval Agency	Permit/Approval/Determination	Status
BCDC	Consistency Determination	Anticipate After ROD
SHPO	Section 106 concurrence and MOA	Anticipate between Draft and Final
Regional Water Quality Control Board	NPDES Statewide Permit (Order No. 99-06-DWQ) Dewatering permit (R2-2007-0033) 401 Water Quality Certification Permit	After ROD After ROD After ROD
Air Pollution Control District	Permit to Construct	After ROD
USACE	404 Nationwide Permit (NWP 14)	Pre-construction notification
USCG	Section 9 Permit Requirements MOU to ensure existing MOA and license criteria currently in effect with the SFOBB ESSSP will apply to the YBI Ramps Improvement Project Encroachment Permit	After ROD Anticipate between Draft and Final EIR/EIS After ROD
MTC	Air Quality $PM_{2.5}$	Anticipate between Draft and Final

CHAPTER 3 – AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The purpose of this chapter is to provide a discussion of the natural and built environment, including many of the community features within the YBI project area. Potential impacts and proposed avoidance, minimization, and mitigation measures, by alternative, are also summarized. Data sources and methodology used for this analysis are briefly discussed with each resource.

A detailed listing of sources can be found in Chapter 7, References. The respective technical reports prepared in support of this Draft EIR/EIS are available from the SFCTA and Caltrans.

GENERAL ENVIRONMENTAL REVIEW PROCESS

This chapter presents results of the analysis of social, economic, and environmental issues relevant to this project. Issues were identified through an initial screening using generally available information about the project and its environmental setting. This chapter covers resource areas where the initial screening identified a possibility for adverse impact.[7] These resource areas are listed in Table 3-1.

Table 3-1: Environmental Resources

Human Environment	Land Use Parks and Recreation Growth Community Impacts Utilities/Emergency Services Traffic and Transportation/Pedestrian and Bicycle Facilities Visual/Aesthetics Cultural Resources (archaeological and historic resources)
Physical Environment	Hydrology and Floodplain Water Quality and Storm Water Runoff Geology/Soils/Seismic/Topography Paleontology Hazardous Waste/Materials Air Quality Noise Energy
Biological Environment	Natural Communities Wetlands and Other Waters Plant Species Animal Species Threatened and Endangered Species Invasive Species

[7] A Preliminary Environmental Analysis Report (PEAR) was prepared for the Project Study Report (PSR) of this project and determined that the anticipated environmental document would be a combined EIR/EIS.

As part of the scoping and environmental analysis conducted for the project, the following environmental issues were considered but no adverse impacts were identified. Consequently, there is no further discussion regarding these issues in this document:

- Wild and Scenic Rivers: The project site is located on YBI, where there are no Federally or state-designated wild and scenic rivers.

- Farmlands/Timberlands: The project site is located on YBI, where there are no farmlands or timberlands.

- 6(f): There are no Section 6(f) properties in the project site. No Land and Water Conservation Fund Act (L&WCF) grants are used in this project, and therefore not discussed any further.

3.1 Land Use

3.1.1 Regulatory Setting

Both state and Federal laws and regulations govern the review and analysis of land use. These laws and regulations are:

National Environmental Policy Act of 1969 (NEPA) – requires all Federal agencies to assess the environmental impacts of proposed projects and disclose the impacts of the project to the public to promote efforts that would prevent or reduce damage to the environment. The President's Council on Environmental Quality (CEQ) was established to provide NEPA implementation guidance for all Federal agencies. Following the CEQ Guidelines, this analysis has been prepared to document the impacts of the proposed project on the environment.

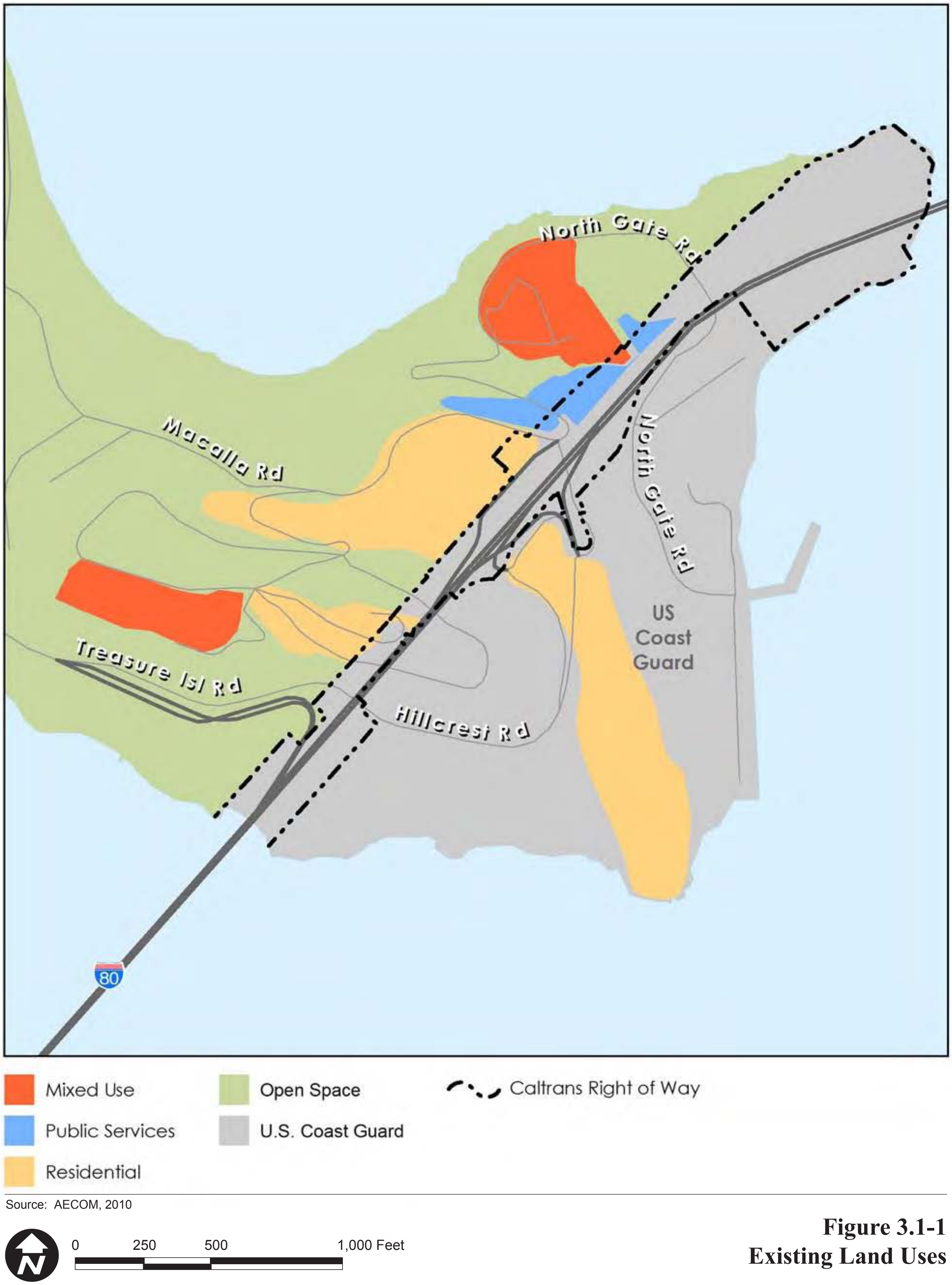
California Environmental Quality Act of 1970 (CEQA) – requires California public agencies to identify the significant environmental effects of their actions, and either avoid or mitigate them, where feasible. This analysis has been prepared following CEQA Guidelines to document the potential impacts of the project on the environment.

3.1.2 Affected Environment

The study area for land use includes the footprint of all project alternatives plus construction staging areas, equipment storage areas, and temporary detour routes on YBI. Existing land uses and proposed land use per the separate TI/YBI Redevelopment Project are shown in Figures 3.1-1 and 3.1-2, respectively.

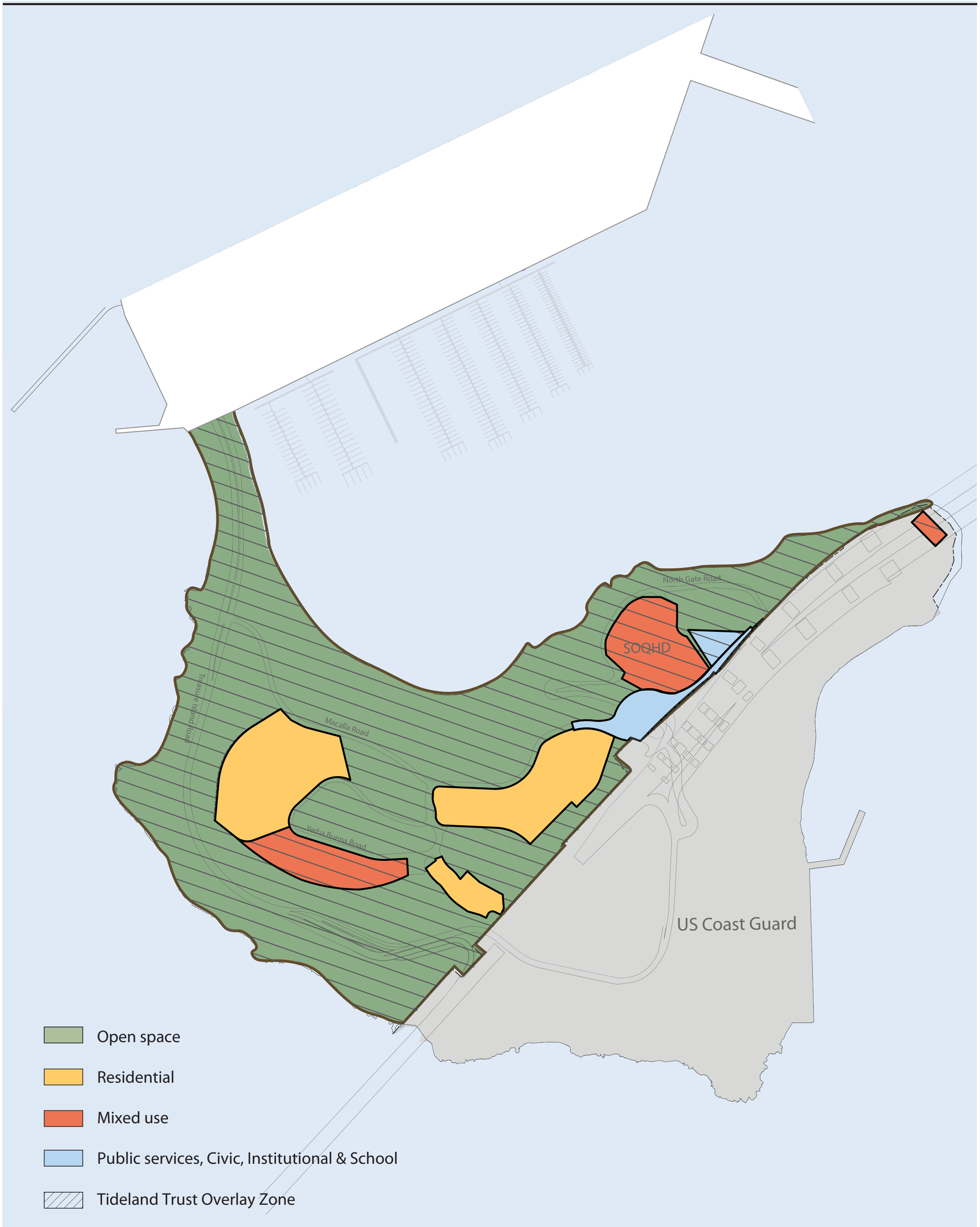
3.1.3 Existing Land Uses

YBI is surrounded by San Francisco Bay waters; the San Francisco mainland is about 3.22 kilometers (2 miles) to the west and Oakland is about 3.22 kilometers (2 miles) to the east. YBI is a natural island that has been used by private parties and the U.S. Army, U.S. Navy, and USCG since the 1840s; the island is steeply sloped and highly vegetated. There are currently about 80 occupiable housing units out of a total of about 105 housing units and 10 nonresidential buildings. The USCG occupies about 19.39 hectares (47.9 acres) of land on the southeast side of YBI, and Caltrans occupies about 8.09 hectares (20 acres) of YBI with portions of the SFOBB and tunnel (City and County of San Francisco 2008a:3). Current land uses on YBI consists of open space, mixed use, public services, and residential (see Figure 3.1-1).



Source: AECOM, 2010

Figure 3.1-1
Existing Land Uses



Source: TIDA 2010

0 500 1000 2000 Feet

Figure 3.1-2
Proposed Land Use

3.1.3.1 U.S. Navy

TI and YBI are the sites of the former Naval Station Treasure Island (NSTI), which was transferred from the U.S. Navy to TIDA in December 2009. TI and YBI encompass approximately 197 hectares of land. NSTI was operational from the 1940s until 1997, when it was decommissioned. There are approximately 10 buildings previously used by the military primarily for storage, communications, fire safety, and administrative purposes on YBI. In addition, there are 105 housing units, 10 of which are large single-family residences originally built for officers; the remainder consists of two-, three-, and four-unit multifamily residential buildings, most of which are single story. Of these 105 units, about 80 housing units, located on the western and central parts of YBI, are currently occupied as market-rate civilian housing (City and County of San Francisco 2008a). Land uses on the eastern side of YBI in the vicinity of the project site include the Senior Officers' Quarters Historic District, which is listed in the National Register of Historic Places (NRHP), and consists of seven residences (Quarters 1–7), two apartments over garages, one five-car garage, and the surrounding landscape. Quarters 1–7 were built in the early 1900s as officers' quarters and are currently leased by TIDA for events and meetings. Two other buildings (Buildings 213 and 262) are located on the eastern side of YBI. Building 213 is currently vacant; however, a fire truck owned by City and County of San Francisco is stored inside. Building 262, known as the Torpedo Building, was constructed in 1891 and is listed in the NRHP. This building is vacant (City and County of San Francisco 2001:3-5). These facilities are discussed in greater detail in Chapter 3.8, Cultural Resources and the Section 4(f) evaluation included in Appendix B.

Treasure Island currently includes approximately 720 occupiable housing units out of about 900 units total, and approximately 91 buildings containing approximately 2.3 million square feet of present and former nonresidential uses. These former military buildings served a broad range of functions, including medical/dental offices, a fire training facility, prison, administrative offices, a conference center, restaurants, and barracks, as well as storage for equipment and other miscellaneous items (City and County of San Francisco 2008a).

The U.S. Navy closed NSTI military operations in 1997 and transferred interim control of most of its property to TIDA via a cooperative agreement, with the intention of transferring all of the property to TIDA. TIDA in turn has made the former military housing available for short-term lease to the general public; currently there are about 3,000 residents in approximately 800 dwelling units on the two islands. There are also limited commercial activities via short-term leases to businesses and community organizations, and the islands host small to medium special events regularly. As part of its closure, the U.S. Navy also transferred 14.57 hectares on TI to the U.S. Department of Labor, who in turn operates a residential-based job training program for at-risk youth. There are approximately 500 residents on the Job Corps Campus today.

3.1.3.2 U.S. Coast Guard

USCG Sector San Francisco occupies approximately 19.39 hectares (47.9 acres) and is located on the southeast side of YBI. Sector San Francisco is important to the region's safety, as it is both the primary Homeland Security base for the entire Bay Area and the primary Vessel Traffic Service (VTS) for the area's waterways. The VTS is responsible for the safe movement of approximately 214.04 kilometers (133 miles) of waterway from offshore to the ports of Stockton and Sacramento, and averages 250 vessel movements a day. Sector San Francisco also oversees operations of the Stations from Bodega Bay south to Monterey. The USCG Sector San Francisco facilities, include housing, administrative, open storage and docks, and buoy maintenance facilities. USCG Sector San Francisco also includes a lighthouse built by the Department of Treasury in 1875 on the southeastern side of YBI, and it was operated by the Lighthouse Service until 1939, at which point the Service was transferred into the USCG. USCG Sector San Francisco also includes Navigation Light No. 6, which is located at the tip of the breakwater on the northern end of TI, is a USCG facility. The Lighthouse Service gradually transitioned into the USCG when it merged with the Cutter Service. The USCG took direct ownership of the lighthouse and the older Sector Buildings in 1939. During the Department of Defense (DoD) and Federal agency screening process, approximately 4.05 additional hectares (10 acres) in the central portion of YBI were granted to the USCG.

3.1.4 Development Trends

3.1.4.1 Proposed Treasure Island/Yerba Buena Island Redevelopment Project

TIDA, and Treasure Island Community Development (TICD), as the prospective master developer, are in the process of conducting environmental review under CEQA and preparing a Redevelopment Plan for the proposed TI/YBI Redevelopment Project, as discussed in Section 1.3, Related Plans and Projects.

The conceptual land use plan for TI/YBI includes development of up to 8,000 dwelling units (including 2,260 below market housing units); up to approximately 13,006 square meters (140,000 square feet) of new commercial and retail space; adaptive reuse of Buildings 1, 2, and 3 with up to 28,893 square meters (311,000 square feet) of commercial space; and approximately 500 hotel rooms; geotechnical stabilization of TI and the causeway connecting it to YBI; new/upgraded public facilities, public utilities, and streets and public ways.

The islands include areas subject to the Tidelands Trust, which generally prohibits residential, general office, nonmaritime industrial and certain recreational uses and shown in Figure 3.1-2.[8] The statutory trust created by the Conversion Act and Tidelands Trust Doctrine are collectively referred to as the “Tidelands Trust.”[9] None of the 150 acres of land on Yerba Buena Island is subject to the Tidelands trust except less than 2 acres of existing tidelands. The purpose of the Tidelands Trust is to ensure that land which adjoins the State’s waterways or is actually covered by those waters remains available for water-oriented uses that benefit and attract the greatest number of people to the waterfront. The California Attorney General and the California State Lands Commission retain oversight.

[8] California State Lands Commission, Public Trust Policy. Available online at http://www.slc.ca.gov/Policy_Statements/Public_Trust/Public_Trust_Policy.pdf (accessed April 18, 2010)

[9] In 1997, the Treasure Island Conversion Act (Assembly Bill 699, amending California Health and Safety Codes Sections 33492.5 and adding Section 2.1 to Chapter 1333, Statutes of 1968) authorized the City and County of San Francisco to establish TIDA as the redevelopment agency with jurisdiction over the redevelopment of Naval Station Treasure Island (NSTI). Under the Treasure Island Conversion Act, TIDA was also granted the authority to administer and control Tidelands Trust property located on or about NSTI.

Any future development in the southeastern half of YBI, on USCG property, would likely be improvements to base facilities and amenities exclusively for USCG personnel, including new residential and light industrial uses. The USCG recently completed a Space Management Report (SMR) for its facilities on YBI. Planned projects include renovation of VTS spaces, expansion to galley facilities, construction of a new Command Center, and planning effort for the future relocation of Sector San Francisco Prevention Division to YBI.

3.1.4.2 Associated Land Transfer

On October 25, 2000, and pursuant to 23 U.S.C. 107(d), FHWA executed a Federal Land Transfer of some land on YBI formerly owned by the United States. The right-of-way for the Interstate System was required over lands owned by the Department of the Navy. FHWA transferred land to Caltrans to give the state adequate right-of-way and control of access for construction of the ESSSP. Any rights-of-way not required for the ESSSP would revert to the United States after project completion. The deed for conveyance of property was recorded on October 26, 2000, with the City and County of San Francisco County Records Office.

The U.S. Navy executed a land transfer with FHWA, who in turn transferred property to Caltrans for construction of the replacement span for the SFOBB. The transfer included the granting of ownership to the agencies as well as the granting of temporary construction easements for the construction period. These transfers, however, may not transfer the entire fee and, even where the fee is transferred, the property may revert to the U.S. Navy or its designee, in this case TIDA, when the need for the interest no longer exists. The ESSSP is not a part of NSTI transfer and reuse.

3.1.5 Future Land Use

Some existing land uses in the project area would continue following the proposed TI/YBI Redevelopment Project including the U.S. Department of Labor Job Corps site for educational and training programs on approximately 14.57 hectares (36 acres) in the center of TI; the USCG station on YBI; and the SFOBB and tunnel structures on YBI. The new east span of the SFOBB will connect to YBI and completion is expected by 2013. Currently, pedestrians and bicyclists use some roads on YBI for access, however these are not designated paths and bikeways. Pedestrian and bikeway paths are proposed as part of the TI/YBI Redevelopment Project on YBI. The details will be determined in the future.

3.1.5.1 San Francisco-Oakland Bay Bridge (SFOBB)

The SFOBB and tunnel structures occupy about 4.05 hectares (10 acres) of YBI. Caltrans maintains an easement for the bridge and structures and is currently constructing the new east span of the SFOBB and will demolish the old one as part of the SFOBB ESSSP.

3.1.6 Land Use Plans and Policies

In addition to Caltrans, the public agencies with jurisdiction over land use in the project area include the U.S. Navy, TIDA, USCG, and BCDC. This section summarizes their existing policies and planning documents and identifies the guiding principles that relate to the proposed project.

U.S. Navy. In December 2009, the U.S. Navy transferred the property known as NSTI to TIDA in accordance with the Base Closure and Realignment Commission (BRAC) process.

Treasure Island Development Authority. In 1997, the California Legislature passed AB 699, the Treasure Island Conversion Act, vesting TIDA with full redevelopment authority for NSTI. In April 1997, the City and County of San Francisco Board of Supervisors adopted Resolution 380-97 establishing TIDA as a nonprofit public benefit corporation responsible for the redevelopment of TI and YBI.

- TIDA began the process to acquire ownership of TI and portions of YBI in the year 2003. A cooperative agreement between TIDA and the U.S. Navy defines responsibilities for maintenance on TI and portions of YBI during the transfer and conveyance process, as well as defines funding and service responsibilities.

- In December 2006, the Development Plan and Term Sheet for the Redevelopment of Naval Station Treasure Island (2006 Development Plan) with Treasure Island Community Development, LLC (TICD) which outlined the plans regarding land uses, phasing infrastructure, transportation, sustainability, housing, including affordable housing, parks and open space, jobs and equal opportunity programs, community facilities and project financing.

- In December 2009, TIDA and the U.S. Navy reached agreement on the basic financial terms for the transfer of the property to TIDA. The 2006 Development Plan was updated in 2010 with adjustments and updates to include the economic terms of the U.S. Navy, development program consistent with the CEQA review, current infrastructure scope and budget, affordable housing, and an updated financing plan.

- The Draft EIR for the TI/YBI Redevelopment Project was issued on July 12, 2010. The 45-day comment period closed on August 26, 2010. The environmental process is currently in the comments and responses phase.

United States Coast Guard. The USCG recently completed a Space Management Report (SMR) for its facilities on YBI. Planned projects include renovation of VTS spaces, expansion to galley facilities, construction of a new Command Center, and planning effort for the future relocation of Sector San Francisco Prevention Division to YBI.

The San Francisco Bay Conservation and Development Commission (BCDC). The BCDC is a state agency that functions as the Federal Coastal Zone Management Agency for San Francisco Bay to regulate development in and around San Francisco Bay in accordance with the Federal Coastal Zone Management Act. The BCDC has jurisdiction over the entire Bay and a shoreline band 30.5 meters (100 feet) shoreward of the mean high tide line. As part of its statutory mandate, the BCDC prepared the San Francisco Bay Plan as its master planning document for San Francisco Bay. The Plan, adopted in 1969, as amended, outlines policies to guide future uses of the bay and shoreline. The BCDC has given YBI a Park Priority designation and has jurisdiction over development within the 30.5 meter (100 foot) shoreline band around the edge of YBI. These “priority use” areas are designated for ports, water-related industry, water-oriented recreation, airports and wildlife refuges. The Bay Plan includes maps that apply these policies to the present bay and shoreline.

The following Bay Plan policy is applicable to YBI:

- "YBI - If and when not needed by Navy or Coast Guard, redevelop released areas for recreational use."

- The proposed project would require a consistency determination from BCDC.

3.1.7 Environmental Consequences

3.1.7.1 Existing Land Use Impacts

NO BUILD ALTERNATIVE

Under the No Build Alternative, the existing on- and off-ramps would remain and no new ramps would be built. No conflict with existing land uses would occur.

ALTERNATIVE 2B AND ALTERNATIVE 4

The proposed project build Alternatives 2b and 4 would occur within existing or proposed Caltrans right-of-way. The project build alternatives would replace existing on- and off-ramps that occupy some of the same land. Some additional land would be necessary to allow for the column foundations for the ramp structure. Additional land for Alternative 2b includes approximately 100 square meter (1,076.4 square foot) drainage easement from the USCG and 7,100 square meter (76,423.8 square foot) fee simple from the U.S. Navy/City of San Francisco. Additional land for Alternative 4 includes approximately 750 square meters (8,072.9 square feet) for an easement to place 6 footings from the USCG, a 8,200 square meter (88,264.1 square foot) aerial easement from the USCG, a 100 square meter (1,076.4 square foot) drainage easement from the USCG, and a 5,800 square meter (62, 430.7 square foot) aerial easement from the U.S. Navy/City of San Francisco. For Alternative 2b, Quarters 10 (and Building 267) would be removed and relocated. No other conflicts with existing land uses would occur.

Consistent with objectives in the City of San Francisco General Plan, both build alternatives would not affect the shoreline. The build alternatives would not conflict with the BCDC park priority designation as it would not affect public access within the 30.5 meter (100 foot) shoreline band. Water-oriented recreational facilities would continue to be accessible to the public and consistent with the BCDC's *The Bay Plan* and park priority use designation.

3.1.7.2 Future Land Use Impacts

NO BUILD ALTERNATIVE

Under the No Build Alternative, the existing on- and off-ramps would remain and no new ramps would be built. No land use changes would occur under the No Build Alternative; therefore no conflicts with future land uses would result.

ALTERNATIVE 2B AND ALTERNATIVE 4

Future land uses including, institutional, open space and mixed-use classifications are planned but not designated at locations beneath the proposed on- and off-ramps in the TI/YBI Redevelopment Project, which is under environmental review. These land uses would only be affected at areas where the columns would be located and where the ramp would meet the grade along Macalla Road. The YBI Ramps project is necessary to improve the functional roles of the current ramps and requires adequate land to build a new facility. No other major land use changes would occur as a result of either build Alternative 2b or 4 and the project alternatives would not result in any other conflicts with future land uses of the TI/YBI Redevelopment Project.

3.1.7.3 Plans and Policies

NO BUILD ALTERNATIVE

Under the No Build Alternative, the existing on- and off-ramps would remain and no new ramps would be built. No land use changes would occur under the No Build Alternative and would not conflict with any land use plans or policies.

ALTERNATIVE 2B AND ALTERNATIVE 4

The proposed project build Alternatives 2b and 4 would not conflict with any land use plans or policies. Additionally, the project and alternatives would not conflict with the policies of the McAteer-Petris Act as they would not require any portion of the bay or shoreline to be filled. As such, no conflicts with land use plans or policies would occur.

3.1.8 Avoidance, Minimization, and/or Mitigation Measures

There is no need to implement any avoidance minimization,, or mitigation measures as a result of project-related impacts to existing or future land uses on YBI or TI. Coordination with TIDA, USCG, and other agencies regarding location and duration of construction activities and their potential temporary influence on existing operations and uses has occurred and would continue prior to the initiation of construction. Coordination with the USCG shall occur as outlined in an MOU, or similar document, that will be in effect prior to and for the duration of construction. Construction activities are discussed in Section 2.4. Most of the area is currently impeded by the construction of the SFOBB project.

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3.2 Parks and Recreation

This section addresses potential impacts resulting from implementation of the proposed project to recreational activities and facilities that currently exist within the project area. Existing project area recreational features are described for YBI and TI, as well as applicable regulatory plans and policies.

3.2.1 Regulatory Setting

NEPA and CEQA both require the analysis of potential impacts to parks and recreational facilities. An impact can be physical in nature (actual taking or encroachment on the facility) or it can be related to the user's enjoyment of the facility (increased noise, decreased safety, etc.). In addition to these analyses, FHWA also requires a separate impacts analysis of parks, recreational facilities, and historic sites if certain conditions are met.

Specifically, Section 4(f) of the U.S. Department of Transportation (USDT) Act of 1966 provides protection to certain publicly used lands and historic sites. Under Section 4(f), FHWA would not approve any program or project that requires the use of any publicly owned public park, recreation area, or wildlife or waterfowl refuge, or a site of any land from a historic site or national, state, or local significance unless:

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

Section 6(f) of the Land and Water Conservation Funds Act requires that any park or recreational land that was purchased with Land and Water Conservation Funds be replaced in-kind. There are no Section 6(f) lands in the YBI study area.

3.2.2 Affected Environment

The proposed project site is located on YBI, a natural island with a land area covering approximately 61 hectares (150.7 acres). The recreational setting of the project area includes surrounding areas such as TI and the waters of the San Francisco Bay. Situated halfway along the SFOBB between San Francisco and Oakland, YBI and TI provide recreational amenities that often emphasize views of the bay. In addition, the islands themselves serve as popular sightseeing landmarks, as recreationalists in and around the bay may experience views of YBI and TI's features.

Despite being located in proximity to the large population centers of San Francisco and Oakland, YBI is primarily open space consisting of steeply sloped and highly vegetated terrain. Approximately 30.35 hectares (75 acres) of YBI is open space with 6.47 hectares 15.9 acres) reserved in easements for the SFOBB and utilities and communications equipment (City and County of San Francisco 2006:3-6). Considerable soil erosion and disturbance are visible in the vicinity of the ramps and causeway on the steep west-facing slopes of the island (City and County of San Francisco 2006:3-11). Due to the dense vegetation and Federal land use restrictions, existing recreational opportunities on the island are limited, but nearby recreational uses primarily provide water-oriented activities on the San Francisco Bay. The waters surrounding YBI and TI include recreational uses such as boating, kayaking, windsurfing, jet skiing, fishing, and swimming. For the most part, outdoor marine facilities are centered around an area known as Clipper Cove (see Figure 1-2), a protected area on the east side of the causeway connecting YBI with TI (City and County of San Francisco 2006:3-11).

There are no recreational facilities within the area where the ramps are proposed. The SF Bicycle Plan would fall under the footprint of the TI/YBI Redevelopment Project footprint, however no bicycle facilities are proposed in the ramp area. Because there are no parks or recreational facilities within the area where the ramps are proposed, the parks and recreational areas on YBI would not be considered for the purposes of Section 4(f). The USCG facility located south of the site, used to have outdoor tennis, basketball, and volleyball courts and a barbeque pit located adjacent to Building 75 for use by USCG personnel (Caltrans 2001b). These recreational amenities have been removed and this area is currently being used as parking and staging areas for Caltrans during construction of the SFOBB South-South Detour project, and would also be used for staging of the YBI Ramps Improvement Project construction. Once construction was complete, it is anticipated that the recreation facilities would be restored (Ressio 2008). However, the USCG recreational facilities would be exclusively for USCG employees and not available for public recreation. In addition, there is a variety of recreation facilities on TI managed by TIDA under a cooperative agreement with the U.S. Navy (Sullivan 2009).

Recreation and open space uses at TI include water-related recreation and boating facilities; indoor and outdoor recreation facilities; and a variety of walking, bike trails, and picnic areas (City and County of San Francisco 2006:3-5). However, there are currently no formally designated trails. Due to its unique location, TI is commonly used as a launching site for windsurfers providing them with access to the waters between TI, Angel Island, and Alcatraz (San Francisco Boardsailing Association 2007).

As mentioned above, water-related recreational facilities are concentrated around Clipper Cove, which is a public marina often utilized as a sailing venue for events such as regattas for dinghies and small keel boats (2009). On the cove's south side, a wooden staircase leads down to a narrow sandy beach on YBI. On the TI side of the cove are Pier 2 and the Treasure Isle Marina (City and County of San Francisco 2006:3-11). Pier 2 is a floating structure used by recreational watercraft (City and County of San Francisco 2006:3-11). Treasure Isle Marina, located at #1 First Street on Clipper Cove, is a recreation marina with approximately 103 slips that offers guest slips for small boats. This marina is in the initial stages of a major renovation program, separate from the TI/YBI Redevelopment Project, that includes the expansion of the existing marina (Treasure Isle Marina 2009). Other water recreation-related organizations that operate facilities out of Clipper Cove on TI include the Treasure Island Yacht Club and Club House and the Treasure Island Sailing Center. The Treasure Island Sailing Center is a nonprofit organization that offers sailing lessons through sponsored sailing clinics and events (Treasure Island Sailing Center 2009). A number of sailing competitions such as the Summer Sailstice Celebration take place on Clipper Cove each year.

Other boating facilities include two recreational boat ramps (Piers 11 and 12) on the southern edge of TI and a fishing pier (Pier 23) on the west side of TI (City and County of San Francisco 2006:3-5). Outdoor recreation facilities include baseball fields, a pitching green, miniature golf course, two tennis courts, basketball courts, and two playgrounds concentrated in the interior of TI. Open space areas include four parks and picnic areas, and walking and bike trails. However, the trails are not formally designated. The dike around TI is also used as a jogging trail (City and County of San Francisco 2006:3-5). YBI and TI open space areas are accessible for public use at all times.

However, certain appropriately marked areas of the islands are considered off-limits to the public due to SFOBB-related construction and ongoing environmental remediation (City and County of San Francisco 2009d).[10] The YBI Ramps Improvement Project would not impact recreational areas as none of the facilities described above do not fall within the project area.

3.2.2.1 Proposed TI/YBI Redevelopment Project

In December of 2006, the San Francisco Board of Supervisors and TIDA endorsed a Development Plan and Term Sheet for the redevelopment of NSTI, which is located predominantly on TI but also encompasses approximately 38 hectares (94 acres) of YBI. The recreational component of the proposed Development Plan intends to further establish YBI and TI as a visitor destination by creating a variety of recreational opportunities. The proposed Development Plan includes the creation of a new waterfront system of parks and open spaces on approximately 121 hectares (300 acres) of land. The plan includes the development of a shoreline path as an extension of the Bay Trail connecting to the ESSSP's new pedestrian and bike path around the perimeter of TI, neighborhood parks and playgrounds, outdoor sport courts and playing fields, a hilltop park on YBI with hiking trails and improved natural areas, a new pedestrian promenade along Clipper Cove marina, and an improved Clipper Cove beach area (City and County of San Francisco 2009d).

3.2.2.2 Applicable Plans and Policies

Applicable objectives from the San Francisco General Plan Recreation and Open Space Element are presented below:

- *Objective 2:* Develop and maintain a diversified and balanced city-wide system of high quality open space.

- *Objective 3*: Provide continuous public open space along the shoreline unless public access clearly conflicts with maritime uses or other uses requiring a waterfront location.

Applicable policies from the San Francisco Bay Conservation and Development Commission's *The Bay Plan* include:

Policy 1. Diverse and accessible water-oriented recreational facilities, such as marinas, launch ramps, beaches, and fishing piers, should be provided to meet the needs of a growing and diversifying population, and should be well distributed around the Bay and improved to accommodate a broad range of water-oriented recreational activities for people of all races, cultures, ages, and income levels. Periodic assessments of water-oriented recreational needs that forecast demand into the future and reflect changing recreational preferences should be made to ensure that sufficient, appropriate water-oriented recreational facilities are provided around the Bay. Because there is no practical

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[10] The Navy is in the process of completing a soil remediation project in an effort to clean up contaminated soils in the area and dispose of hazardous substances. The remedial action plan is in its final stages and is expected to be completed in 2009. The project is referred to as the *Action Memorandum / Interim Remedial Action Plan: Non-Time Critical Removal Action for Solid Waste Disposal Areas, Installation Restoration Site 12, Old Bunker Area, Naval Station Treasure Island, San Francisco, California* (AM/IRAP) (Sullivan 2009).

estimate of the acreage needed on the shoreline of the Bay, waterfront parks should be provided wherever possible.

Policy 2. Waterfront land needed for parks and beaches to meet future needs should be reserved now, because delay may mean that needed shoreline land could otherwise be preempted for other uses. However, recreational facilities need not be built all at once; their development can proceed over time. Interim use of a waterfront park priority use area prior to its development as a park should be permitted, unless the use would prevent the site from being converted to park use or would involve investment in improvements that would preclude the future use of the site as a park.

An applicable action from the San Francisco Metropolitan Transit Authority's *Bicycle Plan* includes: Action 3.11. Work with Caltrans and the Golden Gate Bridge, Highway and Transportation District (GGBHTD) to provide improved bicycle access to and upon all San Francisco bridges wherever feasible and appropriate.

3.2.3 Environmental Consequences

3.2.3.1 Temporary Impacts

Temporary impacts to park and recreational resources on TI/YBI and their users would be related to temporary detours and noise levels due to construction activities associated with the build alternatives. Although there would be an increase in noise levels at the project site and at the nearby USCG facility, the use of this area would not be impaired (see Section 3.15, Noise).

NO BUILD ALTERNATIVE

Under the No Build Alternative, no construction activities would occur and therefore there would be no direct or indirect temporary impacts on park and recreational uses.

ALTERNATIVE 2B AND ALTERNATIVE 4

Temporary impacts would be the same for both build alternatives. Construction activities would result in temporary detours and single-lane closures. These impacts would be minimized through coordination with the USCG and emergency service providers. Efforts would be made to concentrate the majority of road closures and construction activity during off-peak hours to reduce traffic impacts. Signage would be provided to direct bicyclists and pedestrians on YBI and recreational users driving to TI/YBI to take alternate routes. The existing westbound on-ramp on the east side of YBI would also be closed and traffic would be diverted to the westbound on-ramp on the west side of YBI. Access to YBI and TI would be maintained during construction. The build alternatives therefore would not have an impact on recreational facilities. As previously described, the USCG's recreational areas are currently used as a parking area for Caltrans' SFOBB South-South Detour construction. The build alternatives would have no impact on these facilities as a result of construction activities and these facilities would not be considered for purposes of Section 4(f).

3.2.3.2 Permanent Impacts

NO BUILD ALTERNATIVE

The No Build Alternative would not result in any direct or indirect park and recreational impacts. The existing ramps would remain in place and access to and from YBI and TI recreational facilities would not change.

ALTERNATIVE 2B AND ALTERNATIVE 4

The project site is not within an existing park and does not include any recreational facilities. The proposed build alternatives would not interfere with the City's plans for a balanced park system. The Macalla Road improvement would include a 3.66-meter-wide (12-foot-wide) multiuse pedestrian/bike path that would provide a direct connection to the future planned SFOBB ESSSP multiuse path.

Consistent with objectives in the City of San Francisco General Plan, both build alternatives would not affect the shoreline. The provision of this open space would meet the goals of the Development Plan for YBI and TI, which aims to redevelop 121 hectares (300 acres) of open space on TI/YBI with waterfront promenades, bicycle and pedestrian paths, recreational and entertainment facilities, restaurants, shops, hotels, residences, and other public uses. Water-oriented recreational facilities would continue to be accessible to the public and consistent with the BCDC's *The Bay Plan* and park priority use designation.

Neither build alternative would induce growth as discussed in Section 3.3, Growth; therefore, they would not generate a greater demand for existing or future recreational facilities at YBI and TI. The build alternatives would not remove existing recreational facilities or preclude the future development of recreational opportunities set forth in the TI/YBI Redevelopment Plan. The multiuse pedestrian/bike path would provide an alternative means of accessing YBI and TI.

3.2.3.3 Avoidance, Minimization, and/or Mitigation Measures

The project alternatives would not result in impacts to recreational facilities on YBI and TI and thus would not a need to implement avoidance, minimization, or mitigation measures. Coordination with TIDA, the USCG, and other agencies regarding location and duration of construction activities and their potential temporary influence on existing operations and uses would occur prior to the initiation of construction.

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3.3 Growth

3.3.1 Regulatory Setting

The Council on Environmental Quality (CEQ) regulations, which established the steps necessary to comply with NEPA, require evaluation of the potential environmental consequences of all proposed Federal activities and programs. This provision includes a requirement to examine indirect consequences, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations, 40 C.F.R. 1508.8, refer to these consequences as secondary impacts. Secondary impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

CEQA also requires the analysis of a project's potential to induce growth. CEQA Guidelines, Section 15126.2(d), require that environmental documents "…discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…"

3.3.2 Affected Environment

San Francisco and Alameda counties comprise the region of influence (ROI) for growth impacts. The existing condition for population, employment, and housing is 2008, as reflected by 2000 census data and updated by 2007 Association of Bay Area Governments (ABAG) projections. It is expected that most future workers as a result of the TI/YBI Redevelopment Project would commute from these two counties, which are connected to the site by the SFOBB. The direct changes to employment, population, housing, and schools would occur within San Francisco, where the project site is located, and Alameda County, due to proximity and since one or more future ferry terminals serving the TI/YBI Redevelopment Project would be located there. Socioeconomic characteristics of NSTI are described below. Reuse of TI/YBI would result in an almost complete replacement of both its jobs and its population.

3.3.2.1 San Francisco

San Francisco's economy was affected by the recession of the early 1990s but recovered steadily through the mid-1990s. Employment increased by roughly 1,000 jobs per year between 1993 and 1995, and revenues from retail sales also began to grow again (approximately 6 percent per year) during this same period. Construction activity also increased during the mid-1990s, after a period of recession.

San Francisco's economy was affected by the technology boom of the late 1990s. While the growth in high-tech manufacturing jobs centered in the Silicon Valley, San Francisco experienced heated competition among startup and internet-based companies for office space, employees, housing, and services. This economic expansion slowed significantly with the technology downturn after 2000. The City, region, state, and nation are in another recession cycle which began in December of 2007.

San Francisco is likely to continue to reflect regional cyclical patterns of strong growth and periodic recessions. People will continue to be attracted to San Francisco and the Bay Area because of the mild climate, physical beauty, recreation opportunities, excellent universities, and other living amenities. These factors will be tempered by others—such as traffic congestion, and the lack of affordable housing—to slow potential economic growth.

3.3.2.2 Alameda County

The 1980s were a period of continued economic diversification, as well as job growth, for Alameda County. The southern portion of the county attracted numerous high technology industries, while the eastern section became a center for office employment and communications-related industries. In the northern portion of the county, the economy shifted from one dominated by manufacturing industries to a mixture of office employment, government service centers, transportation, and biotechnology (ABAG 2007b).

Alameda County experienced flat job growth between 1990 and 1995—reflecting the economic slowdown throughout California, as well as base closures in Oakland and Alameda—then returned to strong job growth during the second half of the decade, adding 80,000 jobs between 1995 and 2000. Between 2000 and 2005, there was a decrease of 19,890 jobs (ABAG 2007b). ABAG estimates that Alameda County will continue to have strong job growth through the next two decades, adding approximately 369,280 jobs between 2005 and 2025 (ABAG 2007b).

3.3.2.3 Yerba Buena Island (Proposed Land Uses)

In December 2006, TIDA and the Board of Supervisors endorsed a Development Plan and Term Sheet, for the redevelopment of TI and YBI. The Development Plan was updated in 2010 and the Draft EIR for the TI/YBI Redevelopment Project was issued on July 12, 2010 for a 45-day comment period ending on August 26, 2010. The environmental process is currently in the comments and responses phase. The overall purpose of the TI/YBI Redevelopment Project is the conversion of approximately 162 hectares (400.3 acres) on TI and approximately 61 hectares (150.7 acres) on YBI from a former U.S. Navy base to a dense, mixed-use development of residential, commercial, cultural, hotel, and retail uses centered around an Intermodal Transit Hub, with supporting infrastructure, public services and utilities, and a substantial amount of open space. Approximately 150 to 300 housing units are proposed on YBI. The USCG facility on YBI would remain in its current location.

The islands include areas subject to the Tidelands Trust, which generally prohibits residential, general office, nonmaritime industrial and certain recreational uses and shown in Figure 3.1-2.[11] The statutory trust created by the Conversion Act and Tidelands Trust Doctrine are collectively referred to as the “Tidelands Trust.”[12] None of the 150 acres of land on Yerba Buena Island is subject to the Tidelands trust except less than 2 acres of existing tidelands. The purpose of the Tidelands Trust is to ensure that land

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[11] California State Lands Commission, Public Trust Policy. Available online at http://www.slc.ca.gov/Policy_Statements/Public_Trust/Public_Trust_Policy.pdf (accessed April 18, 2010)

[12] In 1997, the Treasure Island Conversion Act (Assembly Bill 699, amending California Health and Safety Codes Sections 33492.5 and adding Section 2.1 to Chapter 1333, Statutes of 1968) authorized the City and County of San Francisco to establish TIDA as the redevelopment agency with jurisdiction over the redevelopment of Naval Station Treasure Island (NSTI). Under the Treasure Island Conversion Act, TIDA was also granted the authority to administer and control Tidelands Trust property located on or about NSTI.

which adjoins the State's waterways or is actually covered by those waters remains available for water-oriented uses that benefit and attract the greatest number of people to the waterfront. The California Attorney General and the California State Lands Commission retain oversight.

The conceptual land use plan would allow for the development of YBI with approximately 300 dwelling units, 464.5 square meters (5,000 square feet) of retail, hotel, hilltop park, managed natural open space and public/community use of historic district including the Nimitz House and Senior Officers' Quarters. Any development would be phased to account for Caltrans' completion of the portion of the construction of the new eastern span of the Bay Bridge that impacts the Senior Officers' Quarters.

Any proposed development in the southeastern half of YBI, owned by USCG, would be intended to improve existing base facilities and amenities. The USCG recently completed a Space Management Report (SMR) for its facilities on YBI. Planned projects include renovation of VTS spaces, expansion to galley facilities, construction of a new Command Center, and planning effort for the future relocation of Sector San Francisco Prevention Division to YBI.

The proposed redevelopment of YBI set forth in the Development Plan is subject to review and approval by BCDC under Federal and state law to determine whether the proposed transfer of land to the City and County of San Francisco and the proposed redevelopment of YBI are consistent with the Park Priority Use designation for YBI in the BCDC Bay Plan.

3.3.2.4 Treasure Island (Proposed Land Use)

The conceptual land use plan for TI includes development of up to 8,000 residential units (including 2,260 below market rate housing units); up to approximately 140,000 square feet of new commercial and retail space; adaptive reuse of Buildings 1, 2, and 3 with up to 311,000 square feet of commercial space; and approximately 500 hotel rooms; geotechnical stabilization of TI and the causeway connecting it to YBI; new/upgraded public facilities, public utilities, and streets and public ways.

The Land Use and Community Impacts sections of this Draft EIR/EIS present additional summaries of general social, economic, and land use conditions in the project area. The discussion of growth inducement for each alternative addresses the following questions:

1. What is the reasonably foreseeable growth and land use change with and without the project?

2. To what extent would the project influence the overall amount, type, location, or timing of that growth?

3. Would project-related growth put pressure on or cause impacts on environmental resources of concern?

3.3.3 Environmental Consequences

3.3.3.1 Temporary Impacts

NO BUILD ALTERNATIVE

Under the No Build Alternative, the YBI Ramps Improvement project would not occur; therefore, no short-term, project-related growth would occur in the project area.

ALTERNATIVE 2B AND ALTERNATIVE 4

Implementation of either build alternative would induce a minimal amount of temporary growth at the project site. Over the short term, project construction activities would take place that would require the establishment of temporary small-scale office facilities at the project site used by construction personnel during working hours. These facilities would comprise the extent of growth (on a temporary basis) that would result from implementation of the YBI Ramps Improvement Project. These facilities would be used during the project implementation period and removed from the site once construction activities were completed. Workers would be from the existing employment pool within the bay area and would not require the relocation or influx of additional population to staff the construction efforts. As such, the build alternatives would not result in temporary growth.

3.3.3.2 Permanent Impacts

NO BUILD ALTERNATIVE

Under this alternative, the YBI ramps would remain in their current state and no ramp construction-related growth would occur in the project area. The No Build Alternative would potentially inhibit the growth potential allowed under the TI/YBI Redevelopment Plan due to the limited capacity of the existing ramps.

ALTERNATIVE 2B AND ALTERNATIVE 4

Implementation of either build alternative would not result in the inducement of direct or indirect unplanned growth in the area. The proposed project would improve acceleration and deceleration distances to and from the westbound lanes of the SFOBB. The project would improve the functional roles of the current ramps and would not place a new permanent facility in an undeveloped area nor would it expand or increase roadway capacity. However, as stated in Section 3.6, Traffic and Transportation/Pedestrian and Bicycle Facilities, of this Draft EIR/EIS, the build alternatives would increase the capacity of the existing westbound on- and off-ramps; however, the increase would be constrained by ramp metering. Caltrans would set the metering rate for the westbound on-ramp based on the traffic volume on the existing SFOBB mainline at the westbound off-ramp. Although the build alternatives would increase accessibility of YBI and TI, growth is expected for the islands due to the TI/YBI Redevelopment Project. The build alternatives would accommodate existing and projected future traffic volumes, however the YBI Ramps Improvement Project is separate and independent of the TI/YBI Redevelopment Project. Therefore, neither Alternative 2b nor Alternative 4 would result in the inducement of direct or indirect permanent unplanned growth in the project area.

3.3.3.3 Avoidance, Minimization, and/or Mitigation Measures

The No Build and two build alternatives would not result in a need to implement avoidance minimization, or mitigation measures resulting from project-related impacts to growth on YBI and TI. Implementation of the No Build Alternative would potentially inhibit the development potential allowed under the TI/YBI Redevelopment Plan and would not cause impacts to resources of concern.

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3.4 Community Impacts

3.4.1 Regulatory Setting

NEPA, established that the Federal government use all practicable means to ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 U.S.C. 4331[b][2]). FHWA in its implementation of NEPA (23 U.S.C. 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.

Under CEQA, an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

3.4.2 Affected Environment

3.4.2.1 Community Character

YBI is composed primarily of open space, utilities facilities, and military housing. An additional 10 nonresidential buildings were used by the U.S. Navy in 1993 primarily for storage, communications, fire safety, and administration. Non-Navy land uses on YBI include the USCG station and the San Francisco-Oakland Bay Bridge, which bisects the island. USCG Sector San Francisco occupies about 19.39 hectares (47.9 acres) of land on the southeast side of YBI, and Caltrans occupies about 8.09 hectares (20 acres) of YBI with portions of the SFOBB and tunnel (City and County of San Francisco 2008a:3).

There are currently about 80 occupiable housing units out of a total of about 105 housing units on YBI (not including USCG Sector San Francisco housing), 10 of which are large single-family residences with the remainder being two-, four-, and eight-unit buildings, generally single-story, although there are some two-story buildings. Housing is concentrated in the interior of the island, north of the SFOBB and southeast of Treasure Island Road.

The 163 hectares (402.8 acres) at TI support 150 former military buildings and 904 housing units. The military buildings served a broad range of functions, including medical/dental offices, a fire training facility, prison, administrative offices, a conference center, restaurants, and barracks, as well as storage for equipment and other miscellaneous items for a total of 232,257.6 square meters (2.5 million square feet).

The U.S. Navy closed NSTI military operations in 1997 and transferred control of most of its property to TIDA via a cooperative agreement. Following the interim transfer, TIDA has made most of the former military housing available for lease to the general public, and currently there are about 2,000 residents in about 820 units on the two islands. There are also limited commercial activities via leases to businesses and community organizations, and the islands regularly host small to medium special events regularly. In December 2009, the U.S. Navy transferred permanent control of all of the property to TIDA.

The project study area for the analysis of community impacts is composed of Census Tract 179.02, which encompasses both TI and YBI. Based on 2000 U.S. Census data, Tract 179.02 had a population of 1,453. Thirty-two percent of residents were between the ages of 25 and 34. The majority of residents, 65%, are White, 12% are Black or African American, 11% are Asian, and 12% represent all other races. Less than 1%, 0.6%, of residents are 65 years and older. In 2000, there were 460 households on the islands with 35%, or 159, being family households. The majority of housing on the Islands is rental, 99.6%. Housing has been used by U.S. Navy and USCG personnel in the past. However, as mentioned above, housing on TI has been made available for lease to the general public.

Land uses on the islands that are expected to remain unchanged include the U.S. Department of Labor Job Corps site for educational and training program on approximately 14.57 hectares (36 acres) in the center of TI; USCG Sector San Francisco on YBI; and the SFOBB and tunnel structures on YBI. Caltrans is currently constructing the SFOBB ESSSP, which will connect to YBI. The new span is expected to be complete by 2013.

3.4.2.2 Community Cohesion

TI and YBI have low degrees of cohesion due to the following indicators:

- a high percentage of single-person households, 65%;
- a relatively young population, only 0.6% of population is 65 years and older;
- the majority of occupied housing being rental, 100%;
- Current and historic use of land on the islands by U.S. Navy and USCG.

A redevelopment plan is being prepared for the islands that would foster growth and the development of new communities by developing a transit hub, and commercial, residential, and recreational uses in the future. The proposed TI/YBI Redevelopment Project is currently undergoing its own environmental review process and a draft EIR is expected to be published in spring 2010.

3.4.3 Environmental Consequences

NO BUILD ALTERNATIVE

The No Build Alternative would not result in any changes that would affect the character or cohesion of the islands.

ALTERNATIVE 2B AND ALTERNATIVE 4

The build alternatives (Alternatives 2b and 4) would occur on YBI within existing or proposed Caltrans right-of-way. Additional easements required for the ramps are discussed in Section 3.1.7.1. The proposed project would replace existing on- and off-ramps and would not impact existing businesses, homes, or activity centers. Although the build alternatives would accommodate future planned development of the islands in accordance with the goals of the TI/YBI Redevelopment Plan, the character and cohesion of YBI and TI would not be altered as a result of the ramps improvement project.

3.4.3.1 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are necessary since there would be no community character- or cohesion-related impacts as a result of the proposed build alternatives.

3.4.4 Relocations

3.4.4.1 Regulatory Setting

Caltrans' Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 C.F.R. Part 24. The purpose of RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 U.S.C. 2000d, et seq.).

3.4.4.2 Affected Environment

As discussed above, YBI contains utilities facilities, military housing, the USCG station, the SFOBB, and additional vacant buildings. TI contains 150 former military buildings and 904 housing units formerly used by U.S. Navy and USCG personnel. However, as mentioned above, housing on TI has been made available for lease to the general public. There are approximately 2,000 residents in about 820 units on the two islands. There are also limited commercial activities via leases to businesses and community organizations. Based on 2000 U.S. Census data, 32% of residents were between the ages of 25 and 34 with less than 1%, 0.6%, over the age of 65. The majority of residents, 65%, are White, 12% are Black or African American, 11% are Asian, and 12% represent all other races. In 2000, there were 460 households on the islands with 35%, or 159, being family households. The majority of housing on the Islands is rental, 99.6%.

3.4.4.3 Environmental Consequences

NO BUILD ALTERNATIVE

Under the No Build Alternative, the existing on- and off-ramps would remain and no new ramps would be built. No temporary and/or permanent removal of occupied buildings in the project area would occur. No residents would be displaced or need to be relocated.

ALTERNATIVE 2B AND ALTERNATIVE 4

Neither of the two build alternatives would result in the temporary and/or permanent removal of occupied buildings in the project area. However, Alternative 2b would require the relocation of Quarters 10 and Building 267, which are unoccupied buildings. The cost of this relocation is estimated at approximately $2 million and was made with preliminary design drawings. Specific details regarding building removal would not be finalized until a preferred alternative was adopted and designed. Please refer to Section 3.8, Cultural Resources, for a detailed discussion of the relocation of Quarters 10 and Building 267 for Alternative 2b.

No residents would be displaced or need to be relocated. The build alternatives would replace existing on- and off-ramps and would not impact existing businesses, homes, or activity centers. USCG personnel would continue to occupy housing on YBI and would not be temporarily or permanently relocated as a result of implementation of either build alternative.

3.4.4.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are necessary since no relocation impacts to existing businesses, residential structures, or activity centers would occur. Mitigation has been identified in Section 3.8, Cultural Resources, regarding relocation of Quarters 10 and Building 267, but these impacts relate to the historic significance of the structures and not to impacts on residents.

3.4.5 Environmental Justice

Environmental justice analysis considers project impacts on minority and/or low-income populations. Determination of the presence of environmental justice populations and the potential effects on those populations largely rely on analysis of demographic information, such as the U.S. Census data, and information gathered through public involvement and outreach activities.

3.4.5.1 Regulatory Setting

All projects involving a Federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by President Clinton on February 11, 1994. EO 12898 directs Federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of Federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2009, this was $22,050 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes prohibit discrimination on the basis of race, color, and national origin in programs and activities receiving Federal financial assistance. Caltrans' commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement, signed by the Director.

3.4.5.2 Affected Environment

TI and YBI have a minority population of 35%, or 485 residents. The minority population consists of 12% Black or African American, 11% Asian, and 12% other races. The 2000 U.S. Census data defines a family as two or more people living together and does not provide a breakdown of household income by size. Accordingly, it is not possible to determine the number of four-person households that fall under the poverty guidelines in accordance with the poverty guidelines described above. However, according to 2000 U.S. Census data, 26% of the population of the project area census tract had incomes that fall below poverty level. Over 45% of two-or-more-person families earned less than $74,999 in 1999, which would be considered low-income based on California State Income Limits for 2009 according to the poverty guidelines described above. However, because there are no residents in the project area, no minority or low-income populations have been identified that would be adversely affected by the proposed project. Therefore, this project is not subject to the provisions of EO 12898.

3.4.5.3 Environmental Consequences

NO BUILD ALTERNATIVE

Under the No Build Alternative, the existing on- and off-ramps would remain and no new ramps would be built. There are no residents in the project area and minority or low-income populations would not be affected.

ALTERNATIVE 2B AND ALTERNATIVE 4

The build alternatives would occur within existing and proposed Caltrans right-of-way. As discussed, no occupied structures would be removed or relocated either temporarily or permanently as part of either build alternative. As such, there are no residents in the project area and minority or low-income populations would not be affected.

Alternatives 2b and 4 would not have disproportionately high or adverse impacts on low-income or minority populations in the project area.

3.4.5.4 Avoidance, Minimization, and/or Mitigation Measures

Based on the above discussion and analysis, the build alternatives would not cause disproportionately high and adverse effects on any minority or low-income populations per EO 12898 regarding environmental justice. Therefore, no avoidance, minimization, or mitigation measures are necessary.

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3.5 Emergency Services and Utilities

This section describes emergency services at YBI and on the San Francisco mainland, including fire protection, police protection, and emergency medical services. Utilities at YBI addressed in this section include potable water and wastewater collection and treatment, storm water collection, energy, telecommunications, and solid waste.

3.5.1 Affected Environment

3.5.1.1 Fire Protection

The San Francisco Fire Department (SFFD) provides fire suppression services and emergency medical services to the City of San Francisco. The SFFD operates out of 48 fire stations and is headquartered at 698 Second Street, in the South of Market (SOMA) neighborhood of San Francisco. The department's resources include 42 engine companies, 19 truck companies, multiple ambulances, two heavy rescue squads, two fireboats, and multiple special purpose units. Emergency response operations include fire suppression; tactical rescue; emergency medical care; fire prevention; arson investigation; response to natural disasters, mass-casualties, and hazardous materials incidents; and fire and EMS dispatch supervision (San Francisco Fire Department 2009a). Staffing levels at the SFFD includes approximately 1,619 uniformed members and 74 civilians. The daily operational strength is approximately 315 staff members (LSA 2007).

The SFFD is organized into three divisions with YBI and TI falling within the operational jurisdiction of Division 3. Division 3 is divided into five Battalions and comprises the SOMA area of San Francisco and runs to the southwestern City limits (San Francisco Fire Department 2009b). Within its boundaries are the San Francisco International Airport, TI and YBI, and the Hunters Point Naval Shipyard. Although there is no fire station on YBI, the fire station closest to the project area is Station 48 (Battalion 3), located on TI. The next nearest is Station 35 (Battalion 3) located at Pier 22½ at the Embarcadero on the San Francisco waterfront. Station 35 also serves as the Fire Boat Headquarters providing access to the islands by fireboat. Both stations 48 and 35 provide services to YBI (San Francisco Fire Department 2009c). The SFFD's average response time is 3 minutes and 22 seconds (San Francisco Fire Department 2009c).

3.5.1.2 Police Protection

The San Francisco Police Department (SFPD) provides police protection services to the City of San Francisco. The SFPD is headquartered at 850 Bryant Street, in the SOMA neighborhood in San Francisco. The SFPD divides the City into two areas (Metro and Golden Gate), which are each divided into five districts, totaling 10 District Stations. The Metro Division encompasses downtown San Francisco, while the Golden Gate Division includes the outer areas and neighborhoods of the City (San Francisco Police Department 2008, 2009). In June 2007, the SFPD had staffing of 2,296 sworn and 350 civilians working in 1 of the 10 District Stations, specialty divisions, the airport, or the department headquarters (San Francisco Police Department 2008).

YBI and TI are within the jurisdictional boundary of the Southern District, within the SFPD's Metro Division. The Southern District incorporates the area around the Ferry Building, extending south from Market Street to 16th Street and east to the Bay, including YBI and TI (San Francisco Police Department, Field Operations Bureau, 2009).

Located at 850 Bryant Street, the Southern District Station is approximately 4.83 kilometers (3 miles) west of the islands with access via I-80. Police protection facilities near the project area also include a police station on TI, which was taken over from the U.S. Navy and has been operated by the SFPD since late 1997 (Caltrans 2001b). This facility occupies the TI Substation located in Building 1 of NSTI.

In the event of large-scale emergency situations, the San Francisco Police Department is assisted by the California Highway Patrol (CHP). The CHP has jurisdiction over I-80 and the SFOBB for matters involving both traffic and emergency services. The Oakland CHP office is located at 3601 Telegraph Avenue, close to the interchange of I-580, State Route 24, and I-980 and approximately 1.6 kilometers (1 mile) east of I-80 and the approach to the SFOBB. The CHP office in San Francisco is located on Eighth Street adjacent to the on- and off-ramps for the SFOBB (City and County of San Francisco 2001).

3.5.1.3 Emergency Medical Services

The San Francisco Office of Emergency Services (OES) is responsible for strategic emergency planning for the City and County of San Francisco. TI and YBI residents have created two community-based programs dedicated to disaster preparedness. The Disaster Preparedness Committee and the Neighborhood Emergency Response Team (NERT) work closely with OES and other disaster-related organizations such as the Red Cross. These organizations are involved in a coordinated effort, including many island groups that aim to self-activate as a neighborhood team in the event of a disaster (Treasure Island Online 2009). An Emergency Preparedness and Response Plan is currently being updated by the OES and local agencies on the islands (City and County of San Francisco 2009a).

The delivery of fire and emergency services within the project area is shared by several jurisdictions, due to the complexity of access to the various segments of the SFOBB and the YBI tunnel. The fire department at TI (Station 48) has first response duties for emergency medical calls on the islands (City and County of San Francisco 2006). The San Francisco Department of Public Health provides paramedic services to San Francisco, including YBI and TI. The nearest medical facility includes a clinic on TI that employs approximately 12 paramedics trained in basic life support (City and County of San Francisco 2006). If a situation requires transporting injured persons, an ambulance unit is requested. The nearest major emergency hospital is the Saint Francis Memorial Hospital located approximately 5 kilometers (3.1 miles) west at 1150 Bush Street in San Francisco.

YBI’s USCG Sector San Francisco has helicopter landing facilities that could be used for transport services and Pier 1 is structurally available to serve as a landing location for helicopters. Use of this area as a landing facility and emergency access would require coordination with USCG Sector San Francisco. In addition, USCG Sector San Francisco on YBI provides another source of emergency medical care via waterborne vessels (City and County of San Francisco 2009a). In the event of bridge or causeway failure, the SFFD can access the perimeter of YBI and TI by fireboat (City and County of San Francisco 2006).

3.5.2 Environmental Consequences

3.5.2.1 Temporary Impacts

NO BUILD ALTERNATIVE

The No Build Alternative would not impact emergency services or response times.

ALTERNATIVE 2B AND ALTERNATIVE 4

Temporary impacts would be the same for both build alternatives. During the construction period, temporary road detours would be required to route traffic around construction areas. Construction activities would result in temporary detours and single-lane closures. These impacts would be minimized through review and coordination with USCG Sector San Francisco and San Francisco emergency service providers. The proposed detour would be part of the final Transportation Management Plan (TMP), which would be required to be reviewed and approved by the SFFD. All detours would be designed to ensure emergency vehicle access. Temporary impacts to response times would be minimized by close coordination with the emergency services providers and familiarity with any detours or road closures. The expected detoured traffic of 110 vehicles in the AM peak hour and 130 vehicles in the PM peak hour (approximately 2 vehicles per minute) is not expected to degrade roadway segment LOS, would not require construction of new facilities, nor would it degrade service levels (response times) below adopted performance objectives of the emergency service providers. Any temporary closures would be addressed in the final TMP prepared as part of this project.

3.5.2.2 Permanent Impacts

NO BUILD ALTERNATIVE

The geometric configuration of the existing ramps has not been updated since the 1960s. The existing ramps act as a traffic operational constraint on the SFOBB due to nonstandard entrances and exits.

ALTERNATIVE 2B AND ALTERNATIVE 4

The proposed new ramps would provide improved access for emergency vehicles to and from the SFOBB. As discussed in Section 3.6, accident rates for the six on- and off-ramps to the SFOBB exceed the statewide average rate for similar facilities. Because the proposed project would modify the geometric configuration of the existing on- and off-ramps on the east side of the tunnel, accident rates at the two ramps would be reduced. Additionally, the westbound on-ramp west of the tunnel would be reserved exclusively for the use of buses and emergency vehicles. As a result, emergency vehicles would more safely and quickly arrive at their destinations. For that reason, either alternative would have beneficial effects to existing emergency service routes and response times.

3.5.2.3 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the No Build Alternative would not result in any temporary impacts to emergency services. However, future development and planning efforts in coordination with emergency service providers would be required because response times would continue to increase with an increase in the population of the islands and traffic loads on the SFOBB. The No Build Alternative scenario does not propose avoidance, minimization, and/or mitigation measures beyond the planning and coordination efforts identified above. Implementation of the build alternatives would result in temporary detours and road closures. Impacts to emergency service access and detours would be minimized through review and coordination with emergency service providers and USCG Sector San Francisco. An alternate emergency access plan will also be in place that establishes YBI access routes within a set time period (currently 1 hour) in the event the advertised access routes experience failure or blockage. These avoidance and minimization measures would ensure that access to the islands would be maintained throughout project construction.

3.5.3 Utilities

Since 1997, the San Francisco Public Utilities Commission (SFPUC) has been managing and operating the potable water, wastewater, storm water, electrical, and natural gas systems on YBI and TI under a cooperative agreement with the U.S. Navy. This section describes the current condition of utility systems in the project area.

3.5.3.1 Affected Environment

WATER SUPPLY

The San Francisco Water Department (SFWD) supplies water to YBI and TI through its 25.4-centimeter-diameter steel pipe attached to the western span of the SFOBB. The water is pumped across the bridge by a pumping station located at 475 Spear Street in San Francisco (City and County of San Francisco 2006). According to the SFPUC staff, the condition of the line is being evaluated and upgrades are being performed as necessary as part of the ongoing SFOBB ESSSP. A second source is another SFWD-owned 30.48-centimeter-diameter (12 inch) pipe on YBI adjacent to the lower deck of the exit ramp. Emergency backup water service is provided by the East Bay Municipal Utility District (EBMUD) through a U.S. Navy-owned, 30.48-centimeter (12 inch), cement-lined steel pipe attached to the eastern span of the SFOBB (City and County of San Francisco 2006). Water from both sources is pumped to four concrete reservoirs with a capacity of 24.6 million liters (6.5 million gallons) that provide potable and fire protection water supplies for the two islands (Caltrans 2001b). Two of the four reservoirs on YBI are currently operational, with reservoirs 242 and 162 receiving water from the San Francisco main (City and County of San Francisco 2006). Caltrans has the right to free use of the EBMUD water line in return for allowing the line to be on the bridge (Caltrans 2001b).

SEWER AND SEWAGE TREATMENT

All wastewater generated on YBI and TI is treated at the sewage treatment plant located at the northeast corner of TI (Caltrans 2001b). The wastewater collection system contains approximately 17,069 linear meters (56,000.5 feet) of 10.16-centimeter (4 inch) to 40.64-centimeter- (16 inch) diameter pipes that operate through both gravity and forced lines (City and County of San Francisco 2006). The collection system at YBI is linked to TI by an underwater 15.24-centimeter (6 inch) force main. There is also a sewer line connecting the two islands along the causeway.

The plant, constructed in 1990, provides secondary treatment and has a design capacity of approximately 7.57 million liters per day (2 million gallons per day), wet weather capacity of approximately 30.28 million liters per day (8 million gallons per day), and storage tanks that provide 757,082 liters (200,000 gallons) of pretreatment storage. The plant is capable of providing service to a residential population of about 22,000 people. Following treatment, residual solids are disposed of at the Redwood Landfill in Marin County (City and County of San Francisco 2006).

STORM DRAINS

Storm drains throughout YBI and TI collect storm water and convey it via 10.16-centimeter (4 inch) to 106.68-centimeter (42 inch) pipelines to outfalls that discharge directly into the San Francisco Bay. There are 26 outfalls at the perimeter of YBI and 49 at TI. The capacity, condition, and operation of the system are largely unknown (City and County of San Francisco 2006).

ELECTRICAL INFRASTRUCTURE

Electricity is supplied to YBI and TI through a U.S. Navy-owned, 12.5-kilovolt (kV) underwater cable, which originates at the Port of Oakland's Davis Substation, located at the former Fleet and Industrial Supply Center in Oakland. Previously, the Pacific Gas and Electric Company (PG&E) provided secondary electrical power to the Islands via two 12.5-kV underwater cables, one originating in San Francisco and the other from PG&E Substation P in Oakland. The underwater cable originating from San Francisco has faulted and is not scheduled for repair or return to service. The main electrical substation is in Building 3 on TI. From that location, four underground 12.5-kV feeders extend to the NSTI distribution system. In addition, two 4.16-kV feeders supply power to YBI. According to the *NSTI Transfer and Reuse Plan Final Environmental Impact Report* (2006), the YBI distribution system is aging and in need of replacement.

TELECOMMUNICATION INFRASTRUCTURE

Telecommunications service is provided to YBI and TI from San Francisco via a conduit system located on the SFOBB, installed in 1989, which consists of basic T-1 trunk lines grouped in cables of 100 to 1,200 copper pairs. The copper cable, consisting of 9,375 cable pairs, is in excellent condition (City and County of San Francisco 2006). The telecommunication system on YBI and TI was designed for the specific requirements of the U.S. Navy and tenant organizations. Telecommunications on YBI and TI were divided into three independent systems, including the residential system, the Consolidated Area Telephone System (CATS), and a classified system. The residential system is operated by Pacific Bell; the CATS and classified system were owned and operated by the U.S. Navy but are no longer in operation.

NATURAL GAS INFRASTRUCTURE

Natural gas is provided to TI and YBI by PG&E via a 25.4-centimeter-diameter (10 inch), high-pressure submarine gas main from Oakland. A metering station is located near the steam plant (Building 455) on TI. This main has a capacity of 19,821.8 cubic meters (700,000 cubic feet) per hour, which is 130% of the current load.

SOLID WASTE

Solid waste is collected either by the U.S. Navy or a private contractor and transported to the Altamont Landfill. The landfill receives an average of 6,000 tons per day from all customers and can accept a maximum of approximately 11,150 tons per day. The landfill was recently expanded and will reach capacity in approximately 30 years (City and County of San Francisco 2006).

3.5.3.2 TI/YBI Redevelopment Project

All on-island infrastructure systems on TI and YBI would be replaced as part of the redevelopment project, if approved. This would include the electrical, gas, telecommunications, and potable water, wastewater, and storm water systems (City and County of San Francisco 2009a).

3.5.4 Environmental Consequences

3.5.4.1 Temporary Impacts

NO BUILD ALTERNATIVE

The No Build Alternative would not result in any direct impacts to the existing utility infrastructure.

ALTERNATIVE 2B AND ALTERNATIVE 4

It is anticipated that certain components of the utility system on YBI and TI would need to be temporarily relocated as part of the YBI Ramps Improvement Project. In those instances, temporary facilities would be provided during construction to maintain continuous utility operations. There would be no impacts to the utility system under the build alternatives as continuous service is planned to be maintained during construction. In some cases, where allowable, utility elements may be relocated before the initial construction phase.

3.5.4.2 Permanent Impacts

NO BUILD ALTERNATIVE

The No Build Alternative would not result in any direct impacts to the existing utility infrastructure.

ALTERNATIVE 2B AND ALTERNATIVE 4

Both alternatives would include the permanent relocation of gas and sewer lines. All utility relocations would be conducted in coordination with the applicable provider. Acquisition of a utility easement within USCG right of way is needed for only Alternative 2b and the cost of that easement is approximately $56,000. No utility easements within USCG right of way are needed for Alternative 4. As such, no impacts related to utility relocations would occur.

3.5.4.3 Avoidance, Minimization, and/or Mitigation Measures

The No Build and two build alternatives would not result in a need to implement avoidance minimization, or mitigation measures resulting from project-related impacts to utilities on YBI and TI; therefore, no direct or indirect adverse effects would occur. Implementation of the No Build Alternative would not require any utility relocations. Implementation of the build alternatives and potential relocations of utilities would be conducted in coordination with the applicable utility providers.

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3.6 Traffic and Transportation/Pedestrian and Bicycle Facilities

This section documents traffic operations on the SFOBB and its six on- and off-ramps to and from YBI in the eastbound and westbound directions. This section also analyzes the operational difference between the existing and projected build and No Build alternatives in the year 2035. There are no operational differences between Alternative 2b and Alternative 4, the two build alternatives, so they are referred to in this section as the Build Alternative.

The current geometric configuration of the ramps has remained mostly unchanged since the 1960s. The on-ramp merge lengths and off-ramp deceleration lengths for the six ramps, and the entrances and exits at the I-80/YBI interchange are nonstandard. All of these conditions create operational constraints. By replacing the existing low-speed westbound on-ramp (which is yield-controlled) with a 267-meter-long (867-foot-long) ramp, rear-end collisions on this ramp are expected to decrease since it will be easier to merge onto the SFOBB. Also, by replacing the westbound left-side off-ramp (which is currently signed for only 32.2 km/h [20 mph]) with a right-side off-ramp that is 340 meters (1,115 feet) long, hit object collisions (involving the guide barrier) on this existing ramp will be eliminated.

A review of the accident data obtained from Caltrans (TASAS Selective Accident Retrieval, Table B) for a 3-year period (between April 1, 2003 and March 31, 2006) indicate that the accident rates (per million vehicle miles traveled) on the Bay Bridge mainline exceeded the statewide average for a similar facility (1.33 vs. 0.8 in the eastbound direction, and 1.30 vs. 0.8 in the westbound direction). Five fatalities were reported in the eastbound direction and one fatality was reported in the westbound direction. Of the total 2,136 accidents in both directions on the Bay Bridge mainline, 24 percent were fatality and injury accidents (513). The predominant type of accident is rear end (1,327 or 62 percent), followed by side swipe (497 or 23 percent), and hit object (254 or 12 percent). Tables 3.6-1 and 3.6-2 illustrate the accident statistics and types of accidents in additional detail.

Table 3.6-1: Accident Statistics (April 1, 2003 – March 31, 2006)

	NUMBER OF ACCIDENTS			ACTUAL RATES (per million vehicle miles)			AVERAGE RATES (per million vehicle miles)		
LOCATION	Fatality	Fatality + Injury	Total	Fatality	Fatality + Injury	Total	Fatality	Fatality + Injury	Total
Bay Bridge (I-80) Eastbound	5	236	1,077	0.006	0.29	1.33	0.004	0.25	0.80
Bay Bridge (I-80) Westbound	1	277	1,059	0.001	0.34	1.30	0.004	0.25	0.80
Eastbound off-ramp (West of tunnel)	-	1	8	0.000	0.41	3.24	0.005	0.39	1.15
Eastbound off-ramp (East of tunnel)	-	-	2	0.000	0.00	2.77	0.003	0.31	0.90
Eastbound on-ramp (East of tunnel)	-	1	7	0.000	0.59	4.12	0.002	0.32	0.80
Westbound on-ramp (East of tunnel)	-	-	2	0.000	0.00	0.75	0.002	0.20	0.60
Westbound off-ramp (East of tunnel)	-	3	4	0.000	1.05	1.40	0.005	0.39	1.15
Westbound on-ramp (West of tunnel)	-	1	1	0.000	1.94	1.94	0.003	0.22	0.60

Source: Caltrans

Table 3.6-2: Collision Types (April 1, 2003 – March 31, 2006)

	TYPE OF COLLISION							
LOCATION	Rear End	Side-swipe	Hit Object	Overturn	Broadside	Head-On	Auto-Pedestrian	Other-Not Stated
Bay Bridge (I-80) Eastbound	611	285	148	7	5	3	1	17
Bay Bridge (I-80) Westbound	716	212	106	3	8	-	-	14
Eastbound off-ramp (West of tunnel)	-	1	7	-	-	-	-	-
Eastbound off-ramp (East of tunnel)	-	-	1	-	1	-	-	-
Eastbound on-ramp (East of tunnel)	7	-	-	-	-	-	-	-
Westbound on-ramp (East of tunnel)	1	-	-	-	-	-	-	-
Westbound off-ramp (East of tunnel)	2	-	2	-	-	-	-	-
Westbound on-ramp (West of tunnel)	1	-	1	-	-	-	-	-

Source: Caltrans

With regards to the collision types for the westbound on and off-ramps that are being replaced on the east side of YBI, a detailed investigation determined the accidents involved motorists who were under the influence of alcohol, speeding, or driving improperly.

3.6.1 Regulatory Setting

Caltrans, as assigned by FHWA, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of Federal-aid highway projects (see 23 C.F.R. 652). It further directs that the special needs of the elderly and the disabled must be considered in all Federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the USDT issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in Federally assisted programs is governed by the USDT regulations (49 C.F.R. part 27) implementing Section 504 of the Rehabilitation Act (29 U.S.C. 794). The FHWA has enacted regulations for the implementation of the 1990 Americans Disabilities Act (ADA), and Caltrans is committed to following these regulations by building transportation facilities that provide equal access to all persons, including those with disabilities. These regulations require application of the ADA requirements to Federal-aid projects, including Transportation Enhancement Activities.

3.6.2 Affected Environment

The following technical reports, included in Appendix H, were consulted:

- YBI Project Traffic Forecast Report (2009a).
- YBI Ramps Project Traffic Operations Report (2009b).

The analysis of traffic operations of the existing ramp configuration was completed using the methodologies described in the Highway Capacity Manual (Transportation Research Board 2000). Ramp analysis was completed using methods from Chapter 25, Ramps and Ramp Junctions, of the HCM.

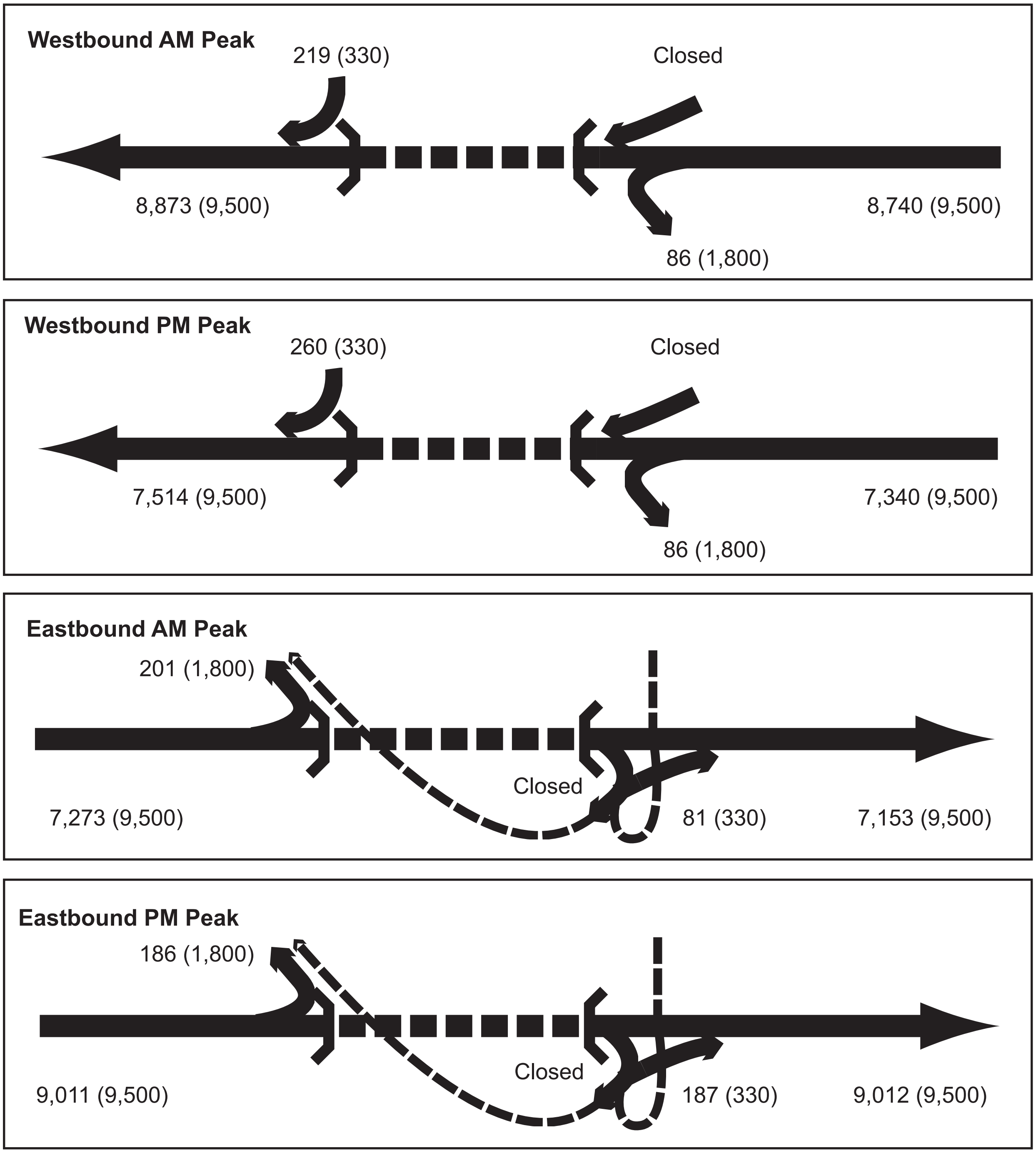
3.6.2.1 Historical Traffic Volumes

A review of historical data published by the Metropolitan Transportation Commission (MTC) in 2007 showed that traffic volumes during the AM peak period were effectively the same in 2001 as in 1991 in both the eastbound and westbound directions. However, traffic volumes during the PM peak period increased in both eastbound and westbound directions during the same time period. A report prepared by the MTC in 2005 shows a reduction of 4 percent in average daily traffic on the SFOBB in the westbound direction.

3.6.2.2 Existing Traffic Volumes

Figure 3.6-1 presents the existing traffic volumes on the SFOBB and ramps in both the eastbound and westbound directions, during both the AM and PM peak hours, respectively. Existing SFOBB ramp traffic volumes were collected from Sunday, May 4 to Saturday, May 10, 2008. Average traffic volumes for the three midweek weekdays (Tuesday, May 6, 2008, to Thursday, May 8, 2008) were selected for the analysis. The AM peak hour was identified as 8:00 a.m. to 9:00 a.m. and the PM peak hour was identified as 4:00 to 5:00 p.m. The SFOBB mainline traffic volumes were obtained from the Freeway Performance Measurement System (PeMS) database for the same 3 days and during the same peak hour to ensure consistency. The data point used to obtain the volumes is located approximately 701 meters (2,297 feet) west of the SFOBB westbound metering lights. It should be noted that SFOBB traffic volumes do not represent actual demand; they represent the actual volumes counted at that location.

Westbound traffic volumes at this location are constrained by the number of vehicles controlled by metering lights during both the AM and PM peak periods. Although capacity of the Bay Bridge is 9,500 vehicles per hour (vph), it is Caltrans' general practice to maintain acceptable operations on the SFOBB by limiting the traffic entering the bridge. This allowable traffic volume is determined by actual traffic volumes recorded at the monitoring station immediately west of the metering lights. Average weekday traffic volume recorded at this monitoring station for the past three years (2006–2008) is approximately 8,600 vph in the morning. There are no metering lights in the eastbound direction in the SFOBB corridor. Therefore, the eastbound SFOBB capacity was assumed to be 9,500 vph for morning and afternoon operational analysis.



1. The volume and capacity are shown as xx (yy).
2. Bay Bridge westbound traffic volumes are controlled by metering lights during both the AM and PM peak periods, and Caltrans sets a limit of 9,600 vehicles per hour onto the Bay Bridge.
3. Bay Bridge eastbound capacity is constrained by the ramps and mainline configuration near First Street. The highest volume counted between 2005 and 2007 was approximately 9,500 vehicles per hour.

Source: CHS Consulting Group:
YBI Ramps Traffic Operations Report, May, 2009

Figure 3.6-1
Existing Peak-Hour Volume

3.6.2.3 Existing Levels of Service

Traffic operating characteristics of intersections are described by the concept of level of service (LOS). LOS is a qualitative description of a ramp segment or intersection performance based on the criteria outlined in the Highway Capacity Manual (HCM). LOS ranges from A, which indicates free flow or excellent conditions with short delays, to F, which indicates congested or overloaded conditions with extremely long delays. Caltrans criteria are used to establish a goal of LOS C, when possible. A project resulting in LOS E or F is considered to have an adverse impact. LOS results for the SFOBB on- and off-ramps were determined by using methods described in Chapter 25 of the HCM for ramps and ramp junctions.

Table 3.6-3 summarizes the LOS criteria for merge and diverge areas and freeway weaving segments. The travel density, LOS, and average speed for each existing ramp junction are shown in Table 3.6-4.

Table 3.6-3: LOS Criteria for Merge and Diverge Areas

LOS	Density (passenger car/mile/lane)		Traffic Flow Characteristics
	Merge and Diverge Areas	Freeway Weaving Segments	
A	≤ 10.0	≤ 10.0	Free flow operation. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.
B	> 10.0 - 20.0	> 10.0 - 20.0	Reasonably free flow. Vehicles maneuver within the traffic stream is only slightly restricted.
C	> 20.0 – 28.0	> 20.0 - 28.0	Freedom to maneuver within the traffic stream is noticeable restricted.
D	> 28.0 – 35.0	>28.0 - 35.0	Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort level.
E	> 35.0	>35.0 - 43.0	Vehicles are closely spaced, leaving little room to maneuver within the traffic stream at speeds that still exceed 49 mph.
F	Demand exceeds capacity	>43.0	Breakdowns in vehicular flow.

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

Table 3.6-4: Existing Ramp Junction Analysis

	Existing AM			Existing PM		
	LOS	Density (pc/mi/ln)	Speed (mph)	LOS	Density (pc/mi/ln)	Speed (mph)
Westbound						
Off-Ramp (left side ramp)	D	28	65	C	25	65
On-Ramp	D	31	56	D	27	59
On-Ramp	D	31	58	D	28	61
Eastbound						
Off-Ramp (left side ramp)	C	25	65	D	31	65
Off-Ramp	C	25	62	D	30	59
On-Ramp	D	27	61	D	34	56

Notes: 1. pc/mi/ln = passenger car / mile / lane
2. Speed based on travel time runs conducted on SFOBB on October 7, 2008.
3. mph = miles per hour

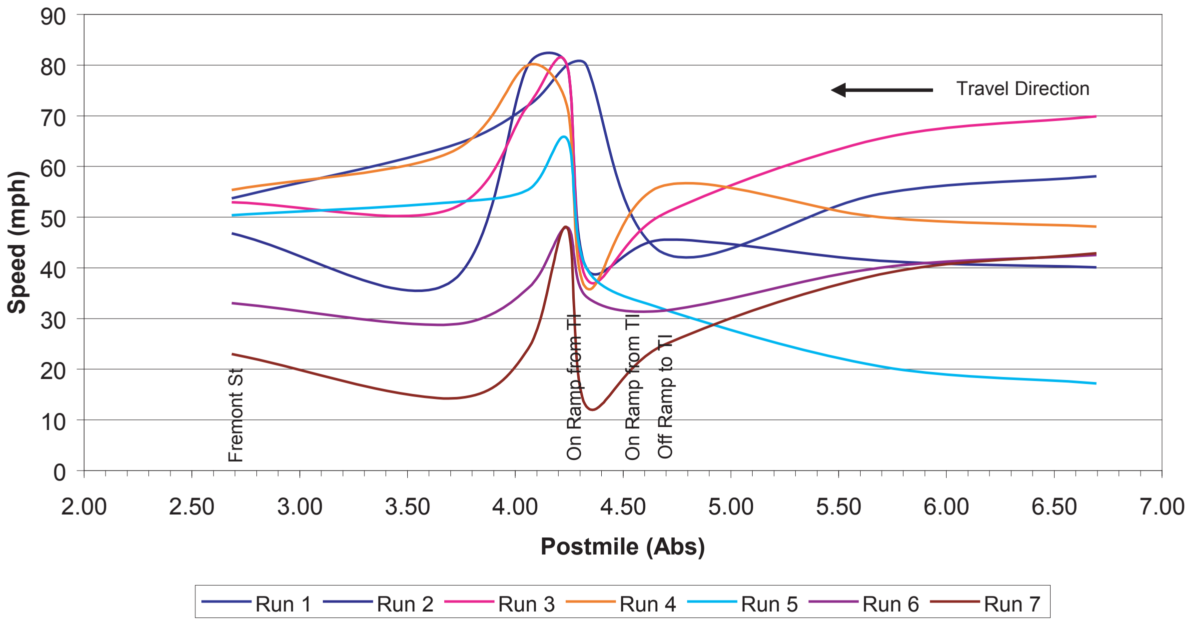
A capacity of 330 vph for the existing westbound on-ramps is assumed. This value was developed based on a combination of the highest volume measured, and gap analysis, as documented in the Disposal and Reuse of NSTI Administrative Final EIS (City and County of San Francisco 2006). The capacity of the mainline was assumed to be 1,900 vehicles per hour per lane (vphpl) based on measured data and methods for field conditions adjustments outlined in the HCM, Chapter 22, Basic Freeway Segments. The capacity of the existing eastbound off-ramps is assumed to be 1,800 vph in accordance with the HCM, Chapter 25, Ramps and Ramp Junctions, Exhibit 25-3, Approximate Capacity of Ramp Roadways. The capacity of the proposed diagonal on- and off-ramps was also assumed to be 1,500 vph and 1,800 vph, respectively, based on free-flow speed. The capacity of the proposed loop on-ramp is assumed to be 1,200 vph based on free-flow speed.

TEST CAR STUDY SECTIONS

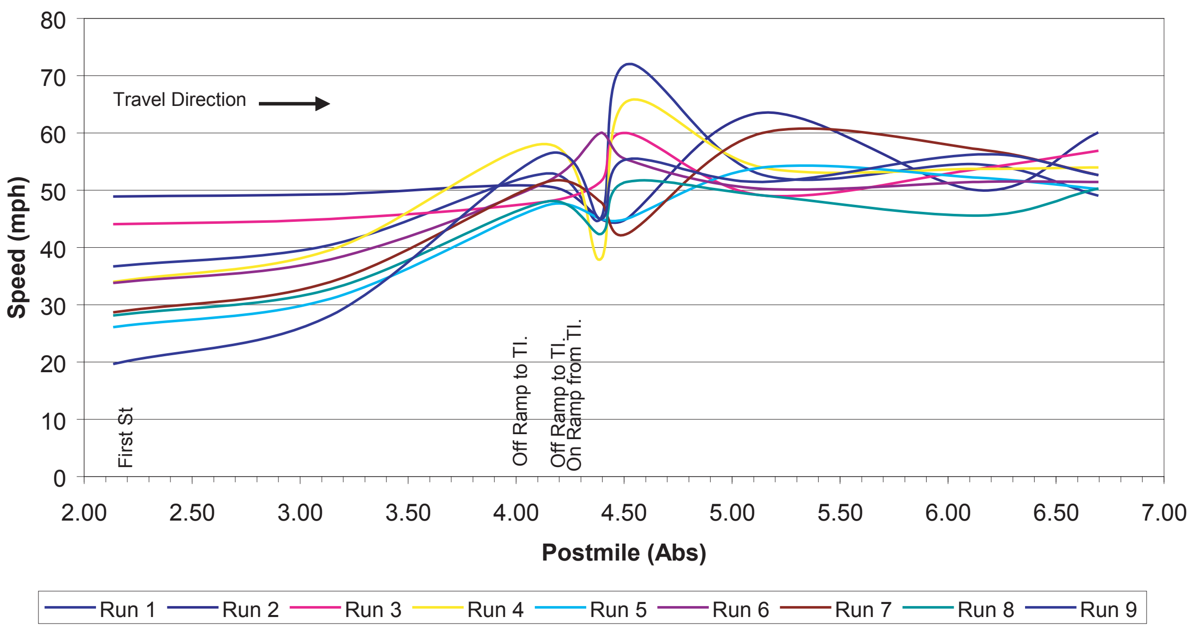
The beginning and end points of each test car run were consistent during the travel time runs. However, the study sections for each period varied slightly. In the eastbound direction, the data collection starting point was the merge onto the SFOBB from the First Street/Harrison Street on-ramp location, while the end point was 7.4 kilometers (4.6 miles) from the start, just before the turnaround location at the toll plaza. In the westbound direction, the data collection starting point was an overhead sign located west of the toll plaza, while the end point location was 8.2 kilometers (5.1 miles) from start at the intersection of Fremont Street and Howard Street. The interim data location points were typically mile markers, as well as the on- and off-ramp locations on YBI.

Figure 3.6-2 shows the results of the travel time for the SFOBB during morning and evening peak periods in terms of speed and distance. Each test car run is shown as an interpolation of the calculated travel speeds versus post mile. Travel speed was calculated based on how long it took to travel between the post miles listed in Table 3.6-5. Note that travel times were calculated only for the eastbound AM peak hour and westbound PM peak hour because these are the major commute directions and, thus, the most critical conditions to assess. Since the bridge is most congested in the major commute directions, analyzing the eastbound AM peak hour and westbound PM peak hour directions represent the “worst-case” scenario on non-commute directions would operate at better levels of service.

Westbound AM Peak Period



Eastbound PM Peak Period



Note: The peak hour travel speed is the average speed between two observed locations.
Note: Eastbound AM and westbound PM peak hours are major commute directions.

Source: CHS Consulting Group:
YBI Ramps Traffic Operations Report, May, 2009

Figure 3.6-2
Peak-Hour Travel Speed

Table 3.6-5: Location of Travel Time Measurements

Westbound	
Location Description	**Post Mile**
Start	6.69
1 Mile	5.69
2 Mile	4.69
Off-Ramp 1 (left side)	4.33
On-Ramp 1	4.24
On-Ramp 2	4.06
3 Miles	3.69
End	2.69

Eastbound	
Location Description	**Post Mile**
Start	2.14
1 Mile	3.14
Off-Ramp 1 (left side)	4.14
Off-Ramp 2	4.39
On-Ramp 1	4.51
3 Miles	5.14
4 Miles	6.14
End	6.69

SFOBB Travel Time

Travel time runs for the SFOBB were performed during the morning and evening peak periods on October 7, 2008. The morning peak period fell between 6:30 a.m. and 9:30 a.m., and the evening peak period hours fell between 3:30 p.m. and 6:30 p.m. Travel time data were collected using a test car method known as the floating car technique, which is a common and accepted practice in traffic engineering (Transportation Research Board 2007). The floating car technique employs a test vehicle that is driven along the study route, whereby the driver floats with the traffic by passing as many vehicles as pass the test car. This technique is preferred for capturing typical driver behavior and vehicular operation of the selected study roadway.

During the AM and PM peak periods for the eastbound direction, speeds are fairly consistent between runs (ranging from 90 to 104 km/h [56 to 65 mph]), indicating minimal congestion and a low occurrence of reduced speed areas. In the eastbound direction, travel speeds for the morning peak period (ranging from 98 to 104 km/h [61 mph to 65 mph]) are greater on average than the evening peak period (ranging from 90 to 104 km/h [56 mph to 65 mph]).

Heading westbound, the rightmost lanes (4 and 5) operate with slower speeds than leftmost lanes (1, 2, and 3) at the approaches to the Fremont Street off-ramp during the peak period. The slower speeds of lanes 4 and 5 are caused by queuing of cars on the Fremont Street off-ramp, due to the lack of capacity, which existed before the closure of the Harrison Street off-ramp. The slower operational speed typically begins at approximately midspan. Occasionally, slower speed traffic extends to the vicinity of the westbound on-ramp junction on the west side of the SFOBB. During non-peak periods, the retrofit construction activity occurring farther to the east near Fifth Street causes traffic to slow down on the SFOBB.

3.6.2.4 Pedestrian and Bicycle Facilities

Though pedestrians and bicyclists use some portions of YBI, there are no officially designated pedestrian or bicycle facilities on YBI in the project area.

3.6.3 Environmental Consequences

3.6.3.1 Temporary Impacts

Construction traffic is expected to access the project site from the SFOBB, using Treasure Island Road and Macalla Road. During the construction period, construction vehicles, equipment, and workers would traverse the project area, resulting in temporary traffic and circulation impacts. Project construction would involve demolition, excavation, construction of new bridge structures, a roadway, sidewalk, retaining wall, landscaping, and signage. Vehicles involved in construction activities would include trucks hauling debris and delivering construction materials and supplies, graders and heavy earthmoving and paving equipment, and commuter vehicles driven by construction workers.

It is anticipated the surrounding traffic circulation will be slower than usual with enforcement of single-lane road closures, flaggers, detours, and temporary traffic controls during project construction for both Alternative 2b and 4. Some queuing is anticipated dependent upon the amount of construction activities. Efforts would be made to concentrate construction activities during off-peak hours. In addition, construction hours are subject to USCG restrictions. Scheduling construction activities during off-peak hours would ensure that roadways in the construction area are open during the peak traffic times to minimize disruption. The two primary types of construction activities that may occur during low traffic periods are:

- Erection of falsework for construction of ramp structures; and,
- Construction of Macalla Road and adjacent retaining wall.

During final design, Caltrans and other affected agencies would be consulted to define specific construction procedures and routes and to implement the Transportation Management Plan (TMP) prepared for the YBI Ramps Improvement Project. A TMP typically is prepared during the PS&E stage of a project and includes information such as contractor work hours, times when lane and/or street closures are permitted, proposed detour signing and routing, construction zone traffic control, and use of flag persons. This section identifies potential impacts that may occur during construction of Alternative 2b and Alternative 4.

ALTERNATIVE 2B

Construction is proposed to be completed in the following five stages:

Stage 1: The first stage would involve construction of bridge substructure followed by construction of westbound on-ramps falsework over Macalla Road. During falsework construction, the existing westbound on-ramp and Macalla Road would result in temporary detours and single-lane road closures. These impacts would be minimized through coordination with the USCG and emergency service providers. Temporary traffic control systems will be utilized during construction to provide guidance to motorists. The next step would consist of completing falsework construction for the ramp bridge portions that will tie into the new SFOBB structure. Once this falsework is completed, that portion of the westbound on- and off-ramp bridge structures can be completed. The existing westbound on-ramp and Macalla Road will remain open during this face.

Stage 2: Construct the retaining wall on the west side of Macalla Road and temporary pavement for travel lane in front of the wall. The temporary pavement lane will accommodate two-way traffic on Macalla Road. Temporary traffic controls will be installed and flaggers will be stationed within the construction limits to guide motorists through the construction zone. The existing substation concrete stairway on the west side of the roadway will be relocated to the west side of the substation prior to the retaining wall construction. The existing westbound on-ramp will remain open to traffic during this phase.

Stage 3: The third stage would involve construction of the abutment for the westbound entrance and exit ramps and Macalla Road. Once the abutment is constructed remaining portion of the westbound ramp bridge deck can be constructed. Temporary traffic controls will be installed and flaggers will be stationed within the construction limits to guide motorists through the construction zone. The existing westbound on-ramp will remain open to traffic during this phase.

Stage 4: Upon completion of the bridge structures, a sidewalk will be constructed on Macalla Road in front of the new retaining wall. Temporary traffic controls will be installed and flaggers will be stationed within the construction limits to guide motorists through construction area. The existing westbound on-ramp will remain open to traffic during this phase.

Stage 5: Construction of the last segment of the westbound on-ramp structure-viaduct structure widening. During construction, the right-hand shoulder of the westbound transition structure will be closed from the YBI Tunnel to approximately Station “W” 51+20. The existing westbound on-ramp will be closed to traffic during this phase. Traffic will be detoured to the existing westbound entrance ramp on the west side of YBI. This detour is expected to shift on-ramp traffic (110 vehicles in AM peak hour and 130 vehicles in PM peak hour) from northbound Macalla Road (on the east side of YBI) to southbound Treasure Island Road (on the west side of YBI). About one month prior to this proposed detour, changeable message signs (as well as standard signage) would be placed at appropriate locations to notify motorists about the upcoming closure of the westbound on-ramp on the west side of YBI.

ALTERNATIVE 4

Construction is proposed to be completed in the following four stages:

Stage 1: The first stage would involve construction of bridge substructure followed by construction of falsework over the Macalla Road which will support proposed westbound on-ramp bridge tie-in to the new SFOBB superstructure. During falsework construction, Macalla Road would result in temporary detours and single-lane road closures. These impacts would be minimized through coordination with the USCG and emergency service providers. The next step will be to complete falsework construction for entire westbound on-ramp structure. Once falsework is completed, a majority of the westbound on-ramp bridge can be constructed. The existing westbound on-ramp and Macalla Road will remain open during this phase.

Stage 2: During this stage, pavement improvements on Macalla Road will be constructed. The existing substation concrete stairway on westerly side of the roadway will be relocated to the westerly side of the building. Temporary traffic controls will be installed and flaggers will be stationed within construction zone. The existing westbound on-ramp will remain open to traffic during this stage.

Stage 3: Upon removal of falsework under the existing westbound on- ramp, construction of the proposed westbound off- ramp that crosses under westbound entrance ramp will begin. Falsework, abutment at South Gate Road, and bridge construction will also be done during this stage. Temporary traffic controls will be installed and flaggers will be stationed within construction zone. The existing westbound on-ramp will remain open to traffic during this stage.

Stage 4: This stage involves construction of last segment of the westbound entrance ramp structure viaduct widening. During this stage right shoulder of westbound SFOBB will be closed from YBI tunnel to approximately Station “W” 51+20. The existing westbound on-ramp will be closed to traffic during this phase. Traffic will be detoured to the existing westbound on-ramp on the west side of YBI. As described above, this detour is expected to shift 110 vehicles in AM peak hour and 130 vehicles in PM peak hour from northbound Macalla Road to southbound Treasure Island Road.

3.6.3.2 Permanent Impacts

FUTURE TRIP DEMAND ON YERBA BUENA ISLAND AND TREASURE ISLAND

Future trip demand volumes were estimated for baseline transit investments only (only those funded improvements were included in the modal split analysis).Table 3.6-4 presents the proposed land use program for the TI/YBI Redevelopment Project and estimated person and vehicle trips for the TI/YBI Redevelopment Project under the baseline transit scenario. The table shows that the TI/YBI Redevelopment Project would generate approximately 2,416 vehicle trips during the AM peak hour (1,062 inbound and 1,354 outbound vehicle trips) and approximately 3,835 vehicle trips during the PM peak hour (2,136 inbound and 1,699 outbound vehicle trips) during the PM peak hour.

It should be noted that the TI/YBI redevelopment configuration detailed in Table 3.6-6 was accurate as of the time in mid-2009 when traffic generation for the project was calculated. The TI/YBI Redevelopment Project continues to undergo refinement as part of its own planning and environmental review process. While the mix of planned land uses is subject to change, TIDA has made the assurance that the reconfiguration would result in land uses that would generate fewer trips than the land use mix assumed in this analysis and expressed in Table 3.6-6. The traffic analysis contained herein is therefore a “worst-case” scenario. Actual traffic generation would ultimately be less than the projected volumes included in this analysis.

The vehicle trips presented in Table 3.6-6 are total vehicle trips that would be generated by the proposed developments on TI and YBI at build-out, and include vehicles currently accessing the islands. These trips would continue to occur after implementation of the TI/YBI Redevelopment Project. The net increase in vehicle volumes would be 1,664 vehicles during the AM peak hour and 2,909 vehicles during the PM peak hour. More specifically, projected traffic volumes for 2035 indicate 319 (=313+6) during the AM peak hour and 583 (=568+15) vph during the PM peak hour on northbound Macalla Road. These volumes are well below the Federal Highway Administration estimated capacity of 800 vph for one lane on a rural highway (FHWA 2008). With the great majority of this traffic expected to be right turns from the westbound off-ramp onto Macalla Road, the stop-controlled off-ramp is expected to operate at LOS B during the PM peak hour (which is busier than the AM peak hour) and the intersection does not warrant signalization.

Table 3.6-6: Treasure Island and Yerba Buena Island Redevelopment Plan Trip Generation by Mode (Baseline Transit Scenario)

Land Use	Total Use	Person Trips					Vehicle Trips[2]		
		Ferry	Bus	Auto	Internal[1]	Total	In	Out	Total
Weekday AM Peak Hour									
Residential	6,000 units	431	526	1,405	1,387	3,749	234	838	1,072
Hotel	500 rooms	100	126	352	339	917	163	103	266
Retail	270,000 sf	131	222	858	712	1,923	346	260	606
Open Space	121.4 hectares	9	15	59	48	131	33	8	41
Marina[3]	400	6	8	34	29	77	11	13	24
Flex	325,000 sf	41	50	134	133	358	87	14	101
Police/Fire	135,000 sf	33	40	107	106	286	67	13	80
School		91	111	296	291	789	121	105	226
Total		**842**	**1,098**	**3,245**	**3,045**	**8,230**	**1,062**	**1,354**	**2,416**
Weekday PM Peak Hour									
Residential	6,000 units	510	623	1,534	1,778	4,445	757	430	1,187
Hotel	500 rooms	50	63	165	186	464	66	60	126
Retail	270,000 sf	397	669	2,418	2,320	5,804	895	823	1,718
Open Space	121.4 hectares	17	29	107	102	255	31	45	76
Marina[3]	400	9	14	53	50	126	19	18	37
Flex	325,000 sf	237	289	712	826	2,064	310	241	551
Police/Fire	135,000 sf	7	9	21	24	61	5	11	16
School		90	90	138	211	529	53	71	124
Total		**1,317**	**1,786**	**5,148**	**5,497**	**13,748**	**2,136**	**1,699**	**3,835**

1 Pedestrian and bicycle trips would be internal to TI.
2 Vehicle-trips include passenger vehicles and vans.
3 The marina use has already been approved and is not part of the proposed TI/YBI Redevelopment Project (although the land-side services associated with the marina are included). The trip generation associated with the marina is presented for informational purposes because it would be used to assess cumulative conditions.
Source: Treasure Island Community Development, LLC and Fehr & Peers 2008.

FUTURE 2035 SFOBB CONDITION ANALYSES

The future 2035 SFOBB condition analysis considers 20-year growth following the completion of the YBI Ramps Improvement Project and includes expected volume from buildout of the TI/YBI Redevelopment Plan. Future traffic demand for the SFOBB was evaluated for the following scenarios regarding the YBI ramps:

- 2035 No Build Condition,

- 2035 Build Condition, and
- 2035 Build Condition with Ramp Metering.

Future traffic demand volumes for the TI project and the SFOBB were estimated using two different methods and then integrated to ensure consistency. Future demand volumes for the TI project were estimated based on the proposed land use program for the TI/YBI Redevelopment Project based on a full build-out of the TI baseline redevelopment project, but without its enhanced Travel Demand Management (TDM) measures or any of its proposed transit service improvements. The demand analysis also does not consider any of the constraining effects of the ramp metering. The redevelopment project proposes a number of TDM measures, including congestion pricing (reducing vehicle use by charging higher tolls for drivers traveling during peak periods), residential transit subsidies, and bicycle sharing. The proposed TDM measures also include a high level of transit service during peak periods:

- New ferry service to San Francisco every 10 minutes,
- New bus service to Downtown Oakland every 7 minutes,
- Maintenance of existing bus service to the San Francisco Transbay Terminal (Muni Route 108-Treasure Island) every 5 minutes, and
- New bus service to the San Francisco Civic Center area every 12 minutes.

This level of mass transit services and TDM measures is expected to result in a substantial shift from automobile transit to use of the new mass transit services. However, funding and/or operating details for all of this service has not yet been resolved or identified and so the improvements cannot be assumed. Therefore, the transportation analysis for the YBI Ramps Improvement Project is based on a scenario with limited TDM measures (no congestion pricing, for example) and the following reduced transit service assumptions (which are based on current funding levels):

- New ferry service to San Francisco every 50 minutes,
- New bus service to downtown Oakland every 7 minutes,
- Maintenance of the existing bus service to the San Francisco Transbay Terminal (Muni Route 108-Treasure Island) every 15 minutes, and
- No new bus service to the San Francisco Civic Center area.

As a result, to be conservative, this analysis is based on the assumption of substantially reduced mass transit services from what is ultimately proposed by the full TI project with TDM measures. The analysis included in this study represents a worst-case scenario in terms of peak-hour vehicle trips using the proposed ramps. Future demand volumes for the SFOBB were based on the MTC's travel forecasting model for the morning peak period and the SFCTA's travel forecasting model for the evening peak period. Two different travel demand models were used because the MTC model was not validated for the evening peak period. In the following discussion, both forecasting methods and integration procedures for future traffic demand, as well as future SFOBB volumes, are discussed. Also, the performance results of the base condition alternatives are described.

FUTURE 2035 SFOBB MAINLINE TRAFFIC VOLUMES

Future traffic volumes for the SFOBB mainline were estimated using the MTC's travel forecasting model (BAYCAST 2009 RTP) for the morning peak period and using the SFCTA's travel forecasting model (Champ 3.2) for the evening peak period. Table 3.6-7 summarizes existing mainline volumes as well as future demand for year 2035.

Table 3.6-7: SFOBB Mainline Existing and Future Traffic Volumes

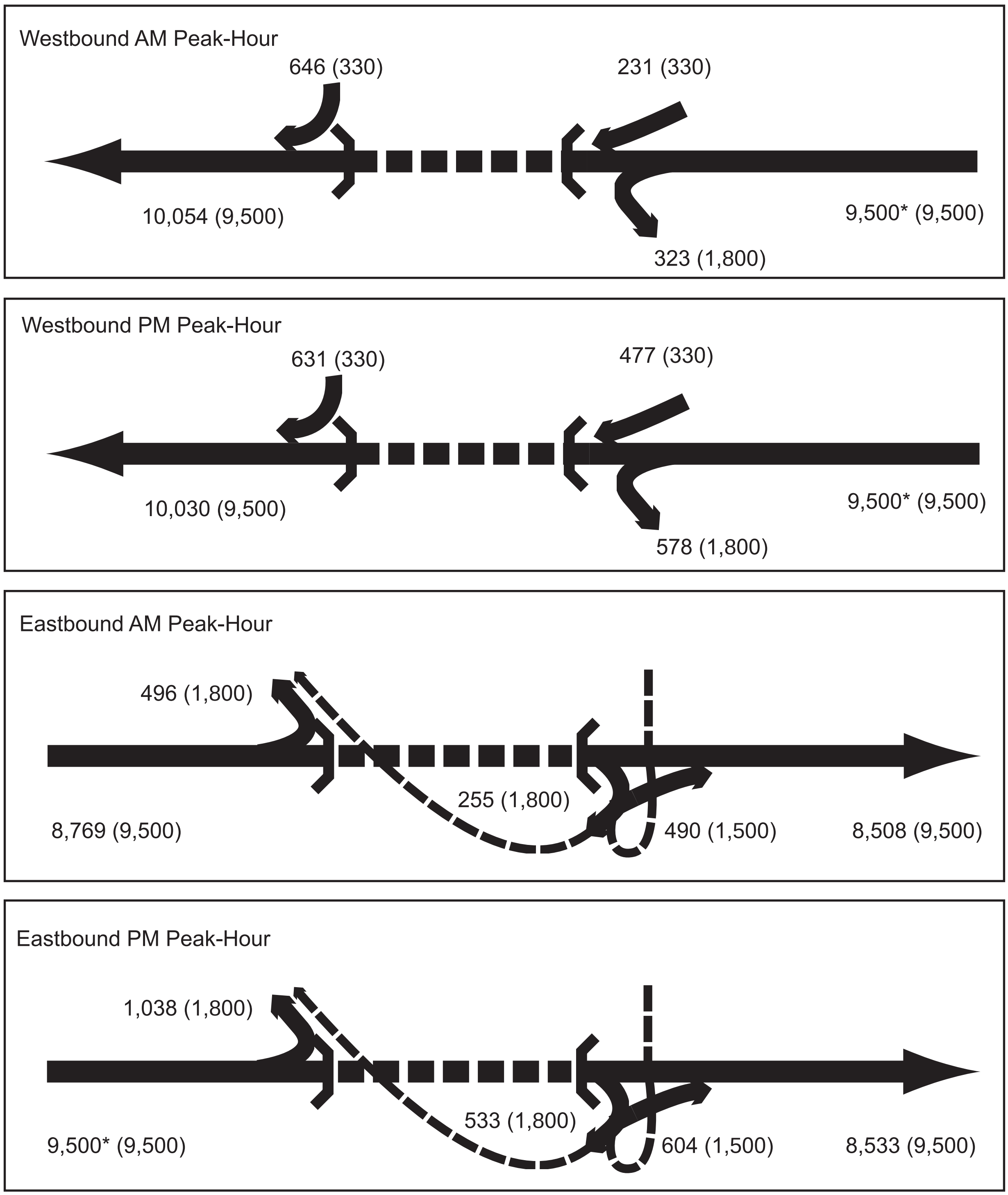
	Existing (2008)	Future Volumes (2035)
Eastbound (from SF to East Bay)		
AM Demand	8,557	8,769
AM Volumes	7,273	8,769
PM Demand	10,402	12,002
PM Volumes	9,011	9,500
Westbound (from East Bay to SF)		
AM Demand	12,652	16,385
AM Volumes	8,740	9,500
PM Demand	9,087	10,462
PM Volumes	7,340	9,500

Source: YBI Ramps Project Traffic Operations Report, 2009b
Notes: 1. AM peak hour demands were based on the MTC model and PM peak hour demands were based on the SFCTA's model.
2. Year 2008 volumes are 85 percentile volumes obtained from the PeMS database.

FUTURE 2035 NO BUILD CONDITION ANALYSIS

The 2035 No Build Condition consists of future 2035 traffic volumes that take into account the TI/YBI Redevelopment Project, and existing ramp configurations and their respective capacities. Figure 3.6-3 illustrates future 2035 peak hour traffic demand volumes in both directions of travel, as well as ramp configurations and capacities. During the morning peak hour, the SFOBB mainline demand volumes are expected to reach 16,385 and 8,769 vph in the westbound and eastbound directions, respectively. The evening peak hour mainline demand volumes are expected to reach 10,462 and 12,202 vph in the westbound and eastbound directions, respectively. However, these demand volumes would be constrained to 9,500 vph in both directions.

Table 3.6-8 summarizes results of the future No Build ramp junction analysis. The No Build condition yields a degraded LOS as compared to the existing condition. In addition, the No Build condition would yield lower average speeds ranging from 61.2 km/h (38 miles per hour [mph]) to 80.5 km/h (50 mph) as compared to 90.1 to 104.6 km/h (56 mph to 65 mph) under existing conditions. The capacity of both westbound on-ramps is assumed to remain at 330 vph under this scenario. This existing capacity level is so low that it is unlikely ramp meters would be installed to lower the rate even further. Additionally, the existing ramps do not have the ability for ramp metering to be installed. A "with ramp metering" scenario was not analyzed under the 2035 No Build Condition as this condition does not meet the need for improving geometric and operational deficiencies of the project and safety would continue to be a concern with or without ramp metering. There is currently no approved ramp metering plan for the existing ramp.



1. The demand volume and capacity are shown as xx (yy).
2. In future scenario, there would be 4 bus trips to San Francisco and 9 bus trips from Oakland.
* Constrained Volumes

Source: CHS Consulting Group:
YBI Ramps Traffic Operations Report, May, 2009

Figure 3.6-3
Future (2035) No Build Peak-Hour Volumes

Table 3.6-8: 2035 No Build Condition Ramp Junction Analysis – No Ramp Metering

	2035 No Build AM (No Ramp Metering)			2035 No Build PM (No Ramp Metering)		
	LOS	Density (pc/mi/ln)	Speed (mph)	LOS	Density (pc/mi/ln)	Speed (mph)
Westbound						
Off-Ramp (left side ramp)	F	49	40	F	47	47
On-Ramp (Post Mile 4.24)	F	49	38	F	48	45
On-Ramp (Post Mile 4.06)	E	41	45	E	41	47
Eastbound						
Off-Ramp (left side ramp)	D	34	50	E	37	50
Off-Ramp	D	33	49	D	33	48
On-Ramp	E	40	48	E	40	48

Source: YBI Ramps Project Traffic Operations Report, 2009b

Notes: 1. Existing capacity level is so low that it is unlikely that meters would be installed to lower the rate even further, and the existing ramps do not have the ability for metering to be installed; therefore, a “with ramp metering” scenario was not analyzed under the 2035 No Build Condition.
2. Speeds shown correspond to mainline speed at ramp junctions.
3. pc/mi/ln = passenger car / mile / lane
4. mph = miles per hour

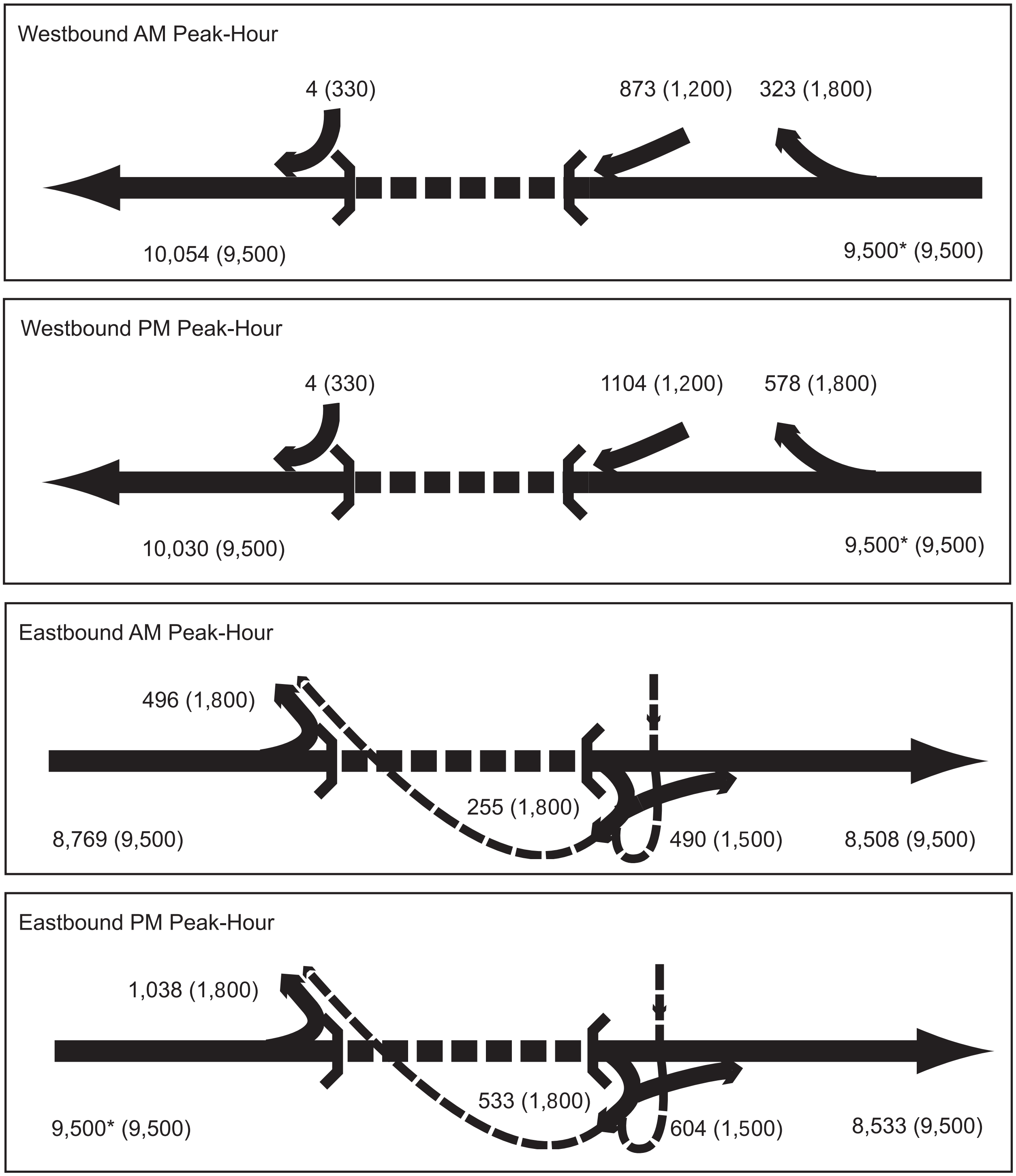
FUTURE 2035 BUILD CONDITION ANALYSIS

The 2035 Build Condition, assuming no constraints (ramp metering), consists of the same 2035 traffic volumes used in the No Build scenario. However, the westbound off-ramp on the left side would be replaced with an off-ramp on the right side and the westbound on-ramp east of the YBI tunnel would be modified to improve its geometry. Figure 3.6-4 illustrates future 2035 Build Condition peak hour traffic demand volumes in both directions of travel, as well as ramp configurations and capacities. In addition to modifications of the ramps east of the tunnel, the westbound on-ramp west of the tunnel would be reserved exclusively for buses and emergency vehicles. The existing configuration of the off-ramps in the eastbound direction would remain unchanged.

Table 3.6-9 summarizes results of the 2035 Build Condition analysis for the ramp junctions. Compared to the No Build Condition, average operating speeds on the SFOBB would be lower. This is due to the increased capacity of the new on-ramp on the east side (1,200 vph) compared to the existing on-ramp (330 vph). Most of the westbound on-ramp traffic would be allowed to enter the mainline unimpeded. Therefore, no on-ramp queuing would result.

2035 BUILD CONDITION WITH RAMP METERING

Caltrans would require ramp metering for the westbound on-ramp on the east side of the island. Based on extensive coordination and discussions with Caltrans staff, it was determined that the methodology used to set the metering rate for the westbound on-ramp would be based on the amount of traffic exiting the SFOBB mainline at the off-ramp. Therefore, for the purposes of this study, the westbound on-ramp metering rate would be approximately 323 vph and 578 vph in the AM and PM peak periods, respectively. It was also noted that ultimately, Caltrans SFOBB Operations would use a



1. The demand volume and capacity are shown as xx (yy).
2. In future scenario, there would be 4 bus trips to San Francisco and 9 bus trips from Oakland.
* Constrained Volumes

Source: CHS Consulting Group:
YBI Ramps Traffic Operations Report, May, 2009

Figure 3.6-4
Future (2035) Build Peak-Hour Volumes

Table 3.6-9: 2035 Build Condition Ramp Junction Analysis - No Ramp Metering

	2035 Build AM (No Ramp Metering)			2035 Build PM (No Ramp Metering)		
	LOS	Density (pc/mi/ln)	Speed (mph)	LOS	Density (pc/mi/ln)	Speed (mph)
Westbound						
Off-Ramp (new, on right side)	F	53	36	F	49	46
On-Ramp (Post Mile 4.24)	F	45	42	E	45	47
On-Ramp (Post Mile 4.06)	E	40	47	E	40	47
Eastbound						
Off-Ramp (left side ramp)	D	34	50	E	37	50
Off-Ramp	D	33	49	D	33	48
On-Ramp	E	40	48	E	40	48

Source: YBI Ramps Project Traffic Operations Report, 2009b
Notes: 1. Speeds shown correspond to mainline speed at ramp junctions.
2. pc/mi/ln = passenger car / mile / lane
3. mph = miles per hour

combination of mainline and ramp metering rates. In other words, there might be times when Caltrans deems it appropriate to lower the allowable limit entering the mainline while increasing the metering rate of the ramps, and vice versa. “Increasing the metering rate of the ramp” means having more green time for the ramp, so that more on-ramp vehicles can enter the mainline at a higher rate (e.g., more vehicles per hour). Likewise, the flow of traffic from the ramp can be constrained by increasing the amount of time that the meter is red.

Under the 2035 Build Condition with Ramp Metering, long delays and queues would be expected on the island. However, additional roadway improvements would not be implemented to accommodate these queues, which would occur only on the approaches to the meters and thus would not substantially impair circulation on YBI. Therefore, island roadways, such as Macalla Road and Treasure Island Road, would not need to be widened to accommodate projected traffic volumes. Table 3.6-10 summarizes the results of the 2035 Build Condition analysis for the ramp junctions with ramp metering. When compared with the results in Table 3.6-9, the project with ramp metering is expected to improve conditions at the westbound on-ramps to LOS C (from LOS E/F) during both the AM and PM peak hours.

PEDESTRIAN AND BICYCLE FACILITIES

The future SFOBB East Span has been designed to incorporate a pedestrian/bicycle path connecting the East Bay with YBI. The SFOBB ESSSP will coordinate connection of the pedestrian/bicycle path at its terminus at the landing area onto South Gate Road for connectivity to other non-motorized improvements on YBI. A component of the YBI Ramps Improvement Project would facilitate this connection by constructing a westward sidewalk and bike lane on Macalla Road.

Table 3.6-10: 2035 Build Condition Ramp Junction Analysis - With Ramp Metering

	2035 Build AM (With Ramp Metering)			2035 Build PM (With Ramp Metering)		
	LOS	Density (pc/mi/ln)	Speed (mph)	LOS	Density (pc/mi/ln)	Speed (mph)
Westbound						
Off-Ramp (new, on right side)	E	35	47	E	35	50
On-Ramp (Post Mile 4.24)	C	40	48	C	40	49
On-Ramp (Post Mile 4.06)	C	40	47	C	40	48
Eastbound						
Off-Ramp (left side ramp)	D	34	50	E	37	50
Off-Ramp	D	33	49	D	33	48
On-Ramp	E	40	48	E	40	48

Source: YBI Ramps Project Traffic Operations Report, 2009b
Notes: 1. Speeds shown correspond to mainline speed at ramp junctions.
2. pc/mi/ln = passenger car / mile / lane
3. mph = miles per hour

3.6.4 Avoidance, Minimization, and/or Mitigation Measures

3.6.4.1 Temporary Impacts

NO BUILD ALTERNATIVE

Under the No Build Alternative the existing on- and off-ramps would remain and no new ramps would be built. No construction would occur; therefore, road closures due to construction activity would not occur.

ALTERNATIVE 2B AND ALTERNATIVE 4

Construction activities would result in temporary detours and single-lane closures. These impacts would be minimized through coordination with the USCG and emergency service providers. Efforts would be made to concentrate the majority of road closures and construction activity during off-peak hours to reduce traffic impacts. Traffic would be diverted to one side of the road and traffic would be controlled by flaggers stationed at both ends of the closure. Similar traffic handling is currently being used on Macalla Road with the ongoing SFOBB construction by Caltrans. Macalla Road primarily serves the USCG and access to their facilities will be maintained at all times before, during, and after construction.

Construction is expected to be completed in five stages. For the first four stages, the existing westbound entrance ramp on the east side of YBI would remain open and therefore little impact is expected on traffic. The last stage of construction is expected to require the closure of the existing westbound entrance ramp (by Macalla Road) on the east side of YBI and thus requiring a detour to the existing westbound entrance on the west side of YBI via Treasure Island Road. This proposed detour would be part of the final TMP, which would need to be reviewed and approved by the Fire Department. The expected detoured traffic of 110 vehicles in the AM peak hour and 130 vehicles in the PM peak hour (about 2 vehicles per minute) is not expected to degrade roadway segment LOS or substantially increase response time for emergency services on YBI.

3.6.4.2 Permanent Impacts

NO BUILD ALTERNATIVE

As discussed above, the No Build Alternative would yield a lower LOS as compared to the existing condition. In addition, the No Build condition would yield lower average speeds ranging from 61.2 to 80.5 km/h (38 to 50 mph), as compared to 90 to 104.6 km/h (56 to 65 mph) under existing conditions. Since demand volumes would exceed this capacity, delays and queues on YBI would be expected.

ALTERNATIVE 2B AND ALTERNATIVE 4

The YBI Ramps Improvement Project would result in the construction of westbound on- and off-ramps on the east side of YBI. The other four ramps would not have their capacity limited so therefore, no further analysis of impacts or issues is needed pertaining to the remaining ramps.

The analysis of the ramps on the east side of YBI without ramp metering concludes that the average operating speed on the SFOBB would be lower because the capacity of the new on-ramp would increase to 1,200 vph from 330 vph. Without ramp metering, on-ramp traffic would be allowed to enter the mainline unimpeded, thus reducing queuing on the on-ramp.

After construction, ramp metering will be in effect, which may cause long delays and queues on the approaches to the on-ramp. With ramp metering, the metering rates can be coordinated such that the number of vehicles entering the mainline would be based on the number of vehicles exiting the mainline. Additionally, the mainline metering lights for westbound traffic (just west of the toll booths) could be coordinated with the on-ramp, such that the traffic entering the SFOBB could be reduced while the metering rate for the on-ramp is increased, and vice versa.

Volumes on the northbound Macalla Road approach to the westbound loop on-ramp are expected to be 879 vehicles in the AM peak hour and 1,119 vehicles (with 1,104 turning right onto ramp) in the PM peak hour in 2035. If the metering rate is set to the expected off-ramp volume of only 578 vph during the PM peak hour, a queue is expected to form on the Macalla Road approach to the on-ramp. To reduce such a queue, the metering rate may need to be increased to about 1,100 vph (which is still less than the 1,200 vph capacity assumed for the loop on-ramp).

The southbound South Gate Road approach to the eastbound loop on-ramp is expected to be 490 in the AM peak hour and 604 in the PM peak hour in 2035. If the metering rate is set to the expected off-ramp volume of only 255 vph during the AM peak hour and 533 during the PM peak hour, the on-ramp queue is expected to be extensive on South Gate Road (especially during the AM peak hour). To reduce these queues, the metering rate may need to be increased to about 500 vph during the AM peak hour and 600 vph during the PM peak hour (which is still less than the 1,500 vph capacity assumed for this loop on-ramp).

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3.7 Visual/Aesthetics

A Visual Impact Assessment (VIA) for the YBI Ramps Improvement Project was conducted in accordance with guidelines provided in the publication *Visual Impact Assessment for Highway Projects* (FHWA 1981). The VIA is included as Appendix I of this Draft EIR/EIS. The EIR visual analysis characterizes the project area in terms of "landscape units," which are distinct segments of the project site and its vicinity that have a consistent or cohesive visual or physical character, and identifies visual quality within the landscape units. Selected viewpoints at the project site and its vicinity where the project could affect existing visual quality are identified and evaluated. In addition, physical changes attributable to the proposed project that would cause changes to views currently experienced by freeway travelers, YBI residents, recreational users, and event attendees are evaluated. Avoidance, minimization, and mitigation measures to address visual effects are also described.

3.7.1 Regulatory Setting

NEPA establishes that the Federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings (42 U.S.C. 4331[b][2]). To further emphasize this point, FHWA in its implementation of NEPA (23 U.S.C. 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

Likewise, CEQA establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of *aesthetic*, natural, scenic and historic environmental qualities" (CA Public Resources Code Section 21001[b]).

3.7.2 Affected Environment

3.7.2.1 Visual Setting

The regional landscape establishes the general visual environment of the project, but the specific visual environment upon which this section will focus is determined by defining landscape units and the project viewshed.

The San Francisco Bay Area extends more than 96.56 kilometers (59.4 miles) from the Sacramento River Delta in Benicia to the marshlands of Santa Clara County, a total of more than 1,000 square kilometers (386.1 square miles). The Bay is a rich marine resource providing navigable waterways for commerce, and habitat for countless wildlife species. The Bay Area combines water, islands, skylines, bridges, and mountains into vistas both picturesque and impressive. Seven different bridges span the Bay, each one constituting a significant visual resource in its own right. The Golden Gate Bridge is known around the world for its grace and beauty. However, all seven bridges span significant stretches of open water and are highly visible from vantage points around the Bay.

Roughly midway between the northern and southern ends of the Bay, the cities of Oakland and San Francisco are located across the Bay from one another. For viewers both on and off the water, the area between these two cities is particularly scenic. Four major islands (Alcatraz, Angel, Treasure, and Yerba Buena) are found in this region, while Mt. Tamalpais and the hills of Marin County tower to the west. The skylines of Oakland and San Francisco provide a vivid and unique visual image. Preservation of this region's aesthetic quality is of particular importance to the millions of people who live in and visit the Bay Area each year.

YBI is a 59.49-hectare (147 acre) natural island that sits in San Francisco Bay between San Francisco and Oakland. The island's high point is located 103 meters (337.9 feet) above mean sea level, and large portions of it are undeveloped, with steep wooded hillsides leading down to the shoreline.

A large amount of the island's surface area is covered with thick vegetation consisting mostly of stands of large, mature eucalyptus trees; smaller ornamental landscape trees; shrubs; and lawn areas. Developed areas of the island are scattered throughout, almost "embedded" within its less developed areas. Consequently, when a person is located in a developed area of YBI, it appears that much of the surrounding area is undeveloped, though other buildings and/or roads are located nearby. Views to these visual elements are obstructed by existing thick vegetation.

The eastern fringe of the island, however, where the USCG installation is located, is mostly flat and open with less vegetation cover. The USCG buildings, mostly small one- and two-story structures, are clustered in groups along the eastern shore of the island. This part of the island, more so than the western side of YBI, is visually dominated by the western terminus of the SFOBB East Span. Users of the island situated in this area are able to see the elevated roadway superstructure of the western terminus in almost any direction.

3.7.2.2 Existing Visual Character

The YBI landscape unit has a certain visual character based upon the land uses that comprise it. These smaller scale uses and landforms within the landscape unit are called image types. These image types give the landscape unit its character. A cross section of image types found on YBI is shown in photographs presented in Figure 3.7-1. The following four general image types can be identified on YBI:

RESIDENTIAL

<u>Older Residential</u> – This image type refers to various single-family residential structures built on the island during the early to middle part of the twentieth century and includes historically significant buildings.

<u>High-Density Residential</u> – This image type refers to newer late twentieth century residential buildings.

<u>Woodland/Open Space</u>. This image type refers to the many areas of the island covered in vegetation. Vegetation includes open lawns, ornamental shrubbery and ornamental trees, to large stands of mature eucalyptus and pine trees.

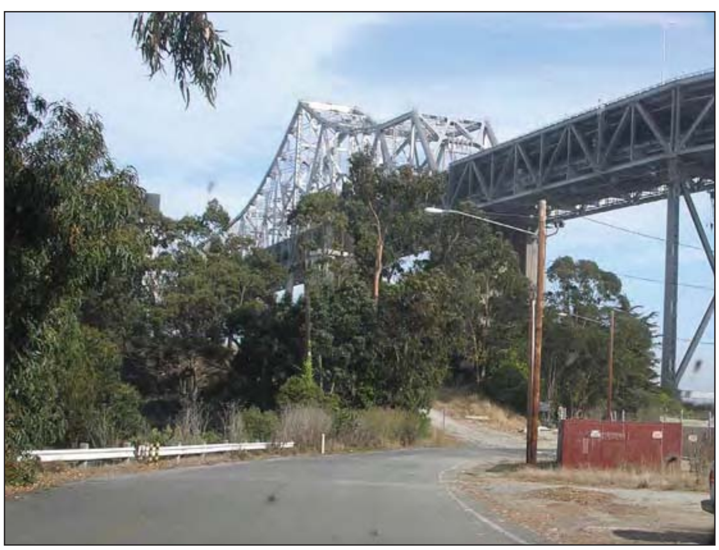
<u>Infrastructure</u>. This image type refers to bridge and surface road facilities on YBI.

A

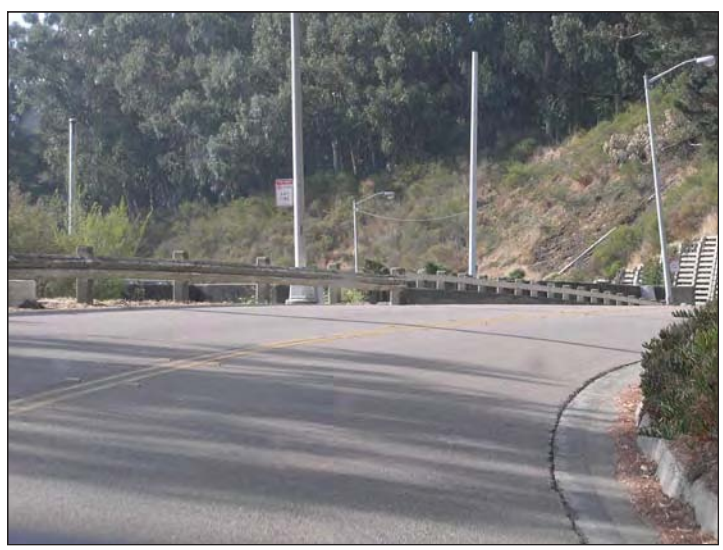
B

C

D



E



F

Figure 3.7-1
Yerba Buena Island Image Types

Institutional. This image type refers to USCG property on YBI. Due to security concerns, no close range photographs of this property are shown, with the exception of one key viewpoint analyzed in this VIA.

Photos “A” and “B” and “C” in Figure 3.7-1 illustrate views of residential, woodland/open space, and infrastructure image types. The photographs show older single-family residential buildings initially used by the U.S. Navy during the early part of the twentieth century. The buildings are situated along narrow roads, in an area where the undulating landform is covered by low shrubs, mature trees, lawn areas, and non-native stands of mature eucalyptus woodland.

Photo “D” in Figure 3.7-1 illustrates the type of high-density residential structures found on YBI, many of which were built during the 1960s and 1970s.

In terms of infrastructure, several of the photos in Figure 3.7-1 provide examples of infrastructure image types on YBI. Photos “D”, “E,” and “F” illustrate the undulating landforms that exist on YBI, a landform that predominates on the island. Owing to this natural landform, roads often undulate and curve as they travel throughout the island, and much of the island’s developed areas conform to the island’s natural topography.

3.7.2.3 Project Viewshed

A viewshed is a subset of a landscape unit and is composed of all the surface areas visible from an observer’s viewpoint. The limits of a viewshed are defined as the visual limits of the views located from the proposed project. The viewshed also includes the locations of viewers likely to be affected by visual changes brought about by project features.

Due to the location of YBI at the geographical center of the Bay Area, the project’s conceptual viewshed is vast. The project area is visible from many Bay Area locations at sea level, and from locations at higher elevations. Similarly, YBI offers vast and often unobstructed view opportunities of large parts of the Bay Area. For practical purposes, the analysis focuses on three primary viewing distance viewshed zones: immediate, moderate and long distance. These distance zones are subsets of the larger conceptual project viewshed.

The immediate distance viewshed zone encompasses the project site and the area of YBI immediately around it. This area offers close views of the SFOBB and the YBI ramps, as well as isolated views to the Bay. From the moderate distance viewshed zone, which extends up to 0.8 kilometer (0.5 mile) away from YBI, the project area is still visible though less well defined. The island’s vegetation begins to obscure some project features and the island as a whole appears as a singular, intact landmass. From the long distance viewshed zone, which extends up to 3.2 kilometers (2 miles) away to the Oakland Touchdown area, project site features are not clearly defined. Sightlines to the various viewsheds from the project site are for the most part unobstructed.

3.7.2.4 Landscape Units

A landscape unit is a portion of the regional landscape and can be thought of as an outdoor room that exhibits a distinct visual character. A landscape unit often corresponds to a place or district that is commonly known among local viewers. The following three landscape units have been identified for the project site and its vicinity. They are shown graphically in Figure 3.7-2.

Northeast YBI Landscape Unit. The SFOBB touches down on the northeastern tip of YBI. This location is visually distinct from other parts of the island due to the bridge structure's dominating effect on views toward the area as well as on views from the area. The area's topography is mostly flat relative to the rest of the island and is also less vegetated. Current SFOBB ESSSP construction activity and construction staging areas associated with that project have affected the area's visual character, in that views of construction materials and equipment are common in this part of the island. Views from this landscape unit include Bay waters, TI, and the East Bay.

Greater YBI Landscape Unit. This landscape unit is visually distinct from the northeast YBI landscape unit. Though from some locations the SFOBB has a strong visual presence, it is less dominant when compared to its effect in the northeastern part of the island. This area is vegetated predominantly with mature eucalyptus trees that grow across the island's hilly landform. Views from this landscape unit are expansive and include Bay waters, TI, the East Bay, South Bay, San Francisco, and Marin.

Bay Water/Shoreline Landscape Unit. This landscape unit encompasses Bay waters near YBI, as well as the shorelines of TI and the Oakland Touchdown area, from which views of YBI are proximate and clear. The visual character of this area is influenced by the expanse of Bay waters that is visible from many vantage points, as well as by the shorelines of nearby land masses.

3.7.2.5 Existing Viewer Groups, Viewer Exposure, and Viewer Awareness

Freeway Travelers. Approximately 275,000 vehicles that use the SFOBB each day pass through YBI. Many of these vehicles contain commuters traveling between San Francisco and the East Bay. Daily commuters may have an increased awareness of views from the road due to their frequency of travel through YBI. Those that experience congested traffic conditions as they travel through YBI tend to focus on views of the island itself. Drivers traveling at normal freeway speeds usually focus attention on long-range nonperipheral views. This viewer group has a heightened awareness of a wide range of views.

YBI Residents (including USCG personnel stationed on island). Upon decommissioning of the Naval base on YBI by the U.S. Navy in 1996, much of the housing stock on the island became occupied by civilian, rather than military residents. Currently, residents that live on YBI in housing of various types are located throughout the island. These residents use the existing YBI on-ramp and off-ramp infrastructure relatively frequently as they arrive at and leave the island and therefore constitute an important viewer group. Some YBI residents also have views from their homes toward the YBI on-ramp and off-ramp infrastructure. USCG personnel are stationed on YBI for extended periods of time and are therefore also an important viewer group.

Recreational Users and Event Attendees. Recreational opportunities abound around the Bay and many of them center upon either the use of the Bay or upon views of the Bay. Activities such as sailing, kayaking, windsurfing, and fishing make use of the Bay itself, while activities such as sightseeing, hiking, biking, and walking often incorporate a view

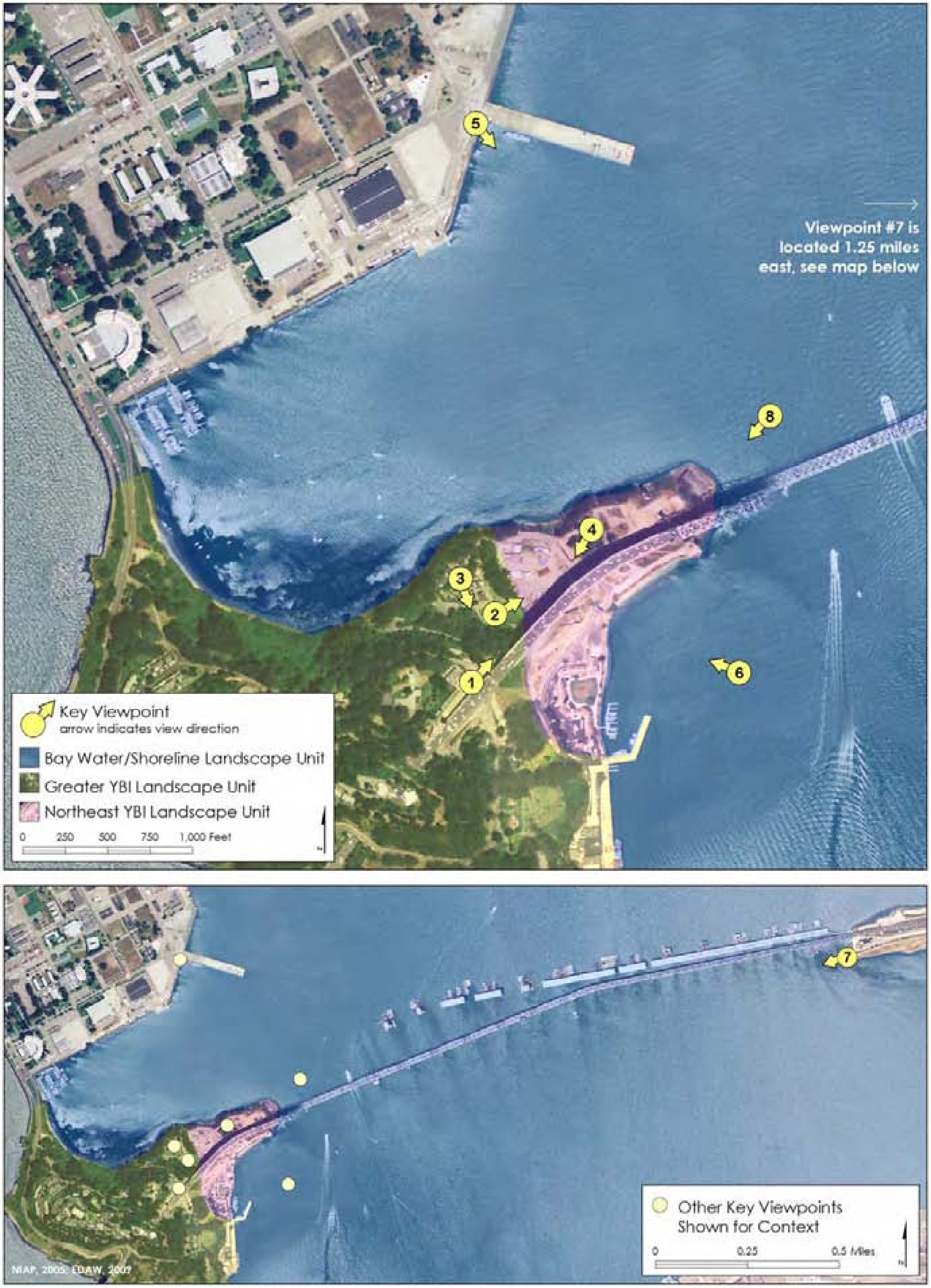


Figure 3.7-2
Key Viewpoint Locations

of the Bay. Recreationalists involved in these activities may at various times experience views of YBI and its features. The island is also host to events such as weddings, which bring visitors to YBI.

3.7.2.6 Existing Visual Quality

Eight key viewpoints were identified to represent the visual character of the project site and used to define visual quality. The existing visual quality for each of the viewpoints was evaluated based on indicators of the level of visual relationships, rather than judgments of physical landscape components. This approach provides a set of three evaluative criteria: vividness, intactness, and unity. These criteria are defined as follows:

- Vividness is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.
- Intactness is the visual integrity of the natural and human-made landscape of the immediate environs and its freedom from encroaching elements.
- Unity is the visual coherence and compositional harmony of the viewshed. The viewshed entails all natural and human-made features found within the normal view range. In man-altered landscapes, it frequently attests to the careful design or fit of individual components in the landscape.

Existing visual quality on YBI is moderately high. The island is located in a natural setting that is very vivid when seen from a variety of vantage points. Simply due to being one of a few islands located on San Francisco Bay, YBI is a very vivid landform that is memorable to people that observe it from near and far. People viewing YBI as they approach the island from the East Bay, or from San Francisco while traveling on the SFOBB, note the strikingly dense land cover found on the island, as well as how it visually interacts with the SFOBB. Other human-made development on the island, such as the well-preserved, distinctive, early-twentieth-century U.S. Navy structures, is quite memorable to island visitors. Viewers located on the San Francisco mainland and to a greater degree, viewers in the East Bay, see YBI in a less defined manner. It is more difficult for these distant viewers to discern the island's variations in topography, its varied vegetation types, and developed areas that contain its residential and institutional buildings.

The overall visual intactness of YBI is moderate, given the effect the SFOBB has had on the island's natural state. In some areas of YBI, the bridge is quite omnipresent and visually dominates other features on the island such as vegetated open spaces and human-made development. Visual intactness of these areas is therefore considered low. From other locations on YBI, the bridge is not visible at all, since it is obstructed by hilly landforms and vegetation, lending these areas a higher degree of intactness. Though these areas may be developed with residential structures and/or infrastructure, these objects blend in with the natural environment to a greater degree than does the SFOBB. When viewed from a distance, or from areas of YBI that are at a higher elevation than the SFOBB, the visual intactness and unity of YBI is higher than when viewed from the island's lower elevations. From higher elevations, the island's landform interacts elegantly with surrounding Bay waters and the SFOBB gracefully meets the YBI land mass. In views from the San Francisco mainland, YBI and the SFOBB together form an intact and unified image consisting of two large structures—one natural and one human made.

3.7.2.7 Identification of Key Viewpoints

Because it is not feasible to analyze all the views in which the proposed project would be seen, it was necessary to select a number of key viewpoints that would most clearly display the visual effects of the project. Key viewpoints also represent the primary viewer groups that would potentially be affected by the project.

A total of eight key viewpoint locations were identified. The viewpoints are identified as the following:

1. Macalla Road at North Gate Road Intersection
2. Nimitz House
3. Officers Quarters Open Space
4. North Gate Road Staging Area
5. Treasure Island
6. Eastern YBI Waterborne Approach
7. SFOBB Oakland Touchdown
8. SFOBB Transition Structure

This chapter discusses two renderings prepared for the Alternative 2b design pertaining to Key Viewpoints 1 and 8, and a discussion of six photo-simulations prepared for the Alternative 2b design related to Key Viewpoints 2 through 7. This is followed by a discussion of two renderings prepared for the Alternative 4 design pertaining to Key Viewpoints 1 and 8, and a discussion of six photo-simulations prepared for the Alternative 4 design related to Key Viewpoints 2 through 7. Key viewpoint locations are listed above.

In addition to “before and after” images of the viewpoints that are illustrated through the use of photo-simulations, the figures also illustrate where a hypothetical observer of each viewpoint would be located geographically relative to the YBI ramps. The images also help the reader distinguish between structural elements associated with the YBI Ramps Improvement Project and elements of the separate SFOBB ESSSP. When evaluating the potential visual impacts of the proposed YBI ramps, it is important to recognize to what degree visual impacts in the project area would be caused by the YBI Ramps Improvement Project compared to impacts resulting from the separate SFOBB ESSSP. This is done through the use of graphical insets that clearly distinguish which structures in each viewpoint are associated with the YBI Ramps Improvement Project and which are a part of the SFOBB ESSSP. In these insets, structures associated with the YBI Ramps Improvement Project appear in color (blue for Alternative 2b insets, orange for Alternative 4 insets), while the rest of the image is shown in black and white.

The photo-simulations and renderings presented for Alternative 2b illustrate ramp designs that incorporate ribbing on road deck undersides, while Alternative 4 photo-simulations and renderings present ramp designs without ribbing. A ribbed design is dramatically distinct from a nonribbed design. Therefore, it is necessary to separately consider the visual effects of each design technique. To facilitate analysis of this design feature in an effective manner, the ribbed design technique is presented only for Alternative 2b, while the nonribbed design technique is presented only for Alternative 4.

Rather than compare the visual effects of a ribbed design with a nonribbed design for each alternative and each viewpoint, it is useful to discuss the effects of each technique on a more holistic scale that would apply to both alternatives and all viewpoints.

The rib design technique proposed for the YBI ramps involves installation of semi-rectangular-shaped concrete elements on the lateral undersides of the road decks. Each rib would measure about 9 meters (29.5 feet) in length from the outside edge of the ramp to near its center, and 61 centimeters (2 feet) wide when viewed in profile from below the ramp. The ribs would be spaced about 3 meters (9.8 feet) apart from each other.

3.7.2.8 Description of Key Viewpoints

The key viewpoints are typical views that people would have of or from the project, as described below:

KEY VIEWPOINT 1 – MACALLA ROAD AT NORTH GATE ROAD INTERSECTION

Orientation. This key viewpoint, shown in Figure 3.7-3, is toward the northeast from the intersection of Macalla Road and North Gate Drive. Implementation of Alternative 2b would require removal of Building 267 (a garage located in the center of the view), to provide right-of-way for the YBI ramps. Analysis of this viewpoint is based on a rendering rather than a photo-simulation. Implementation of Alternative 2B would require removal of Quarters 10 (a US Navy residential structure) and Building 267 (a garage associated with Quarters 10), in order to provide right-of-way for the proposed ramps. Quarters 10 is not visible from this vantage point. Therefore, it would be inaccurate to present a “before” image of the vantage point when a structure that would be drastically affected by the project is not visible in the image. For this reason, a rendering was chosen as a means to illustrate the visual effect of the ramps at the intersection of Macalla Road and North Gate Road.

Landscape Unit. Greater YBI landscape unit.

Viewer Groups. This viewpoint represents a typical view experienced by YBI residents.

Existing Visual Quality/Character. This area of the island is dominated by the presence of the double-deck structure of the SFOBB East Span as it nears the YBI tunnel. The view presented in this viewpoint is a vivid microcosm of the island itself, in that on YBI there is often an inter-play between the natural environment and the SFOBB. In this view, the bridge’s intactness and unity are relatively low, due to the large scale and omnipresence of the road decks when viewed from such close proximity. Overall unity and intactness of the view are low when all of its elements are taken together. The substation on the left side of the view, Building 267, the mature vegetation, and the road decks present a cluttered image in which natural features and human-made features do not visually complement each other.

KEY VIEWPOINT 2 – NIMITZ HOUSE

Orientation. This key viewpoint looks northeast from the patio of the Nimitz House, one of the historic U.S. Navy structures located on the island. Figure 3.7-4 depicts a view of existing conditions from this viewpoint.

Landscape Unit. Greater YBI landscape unit.

Viewer Groups. This viewpoint represents a typical view experienced by recreational users and event attendees.

Existing Visual Quality/Character. Like Viewpoint 1, Viewpoint 2 also illustrates a close-up of the SFOBB alongside mature vegetation. However, this viewpoint has higher vividness than the image presented in Viewpoint 1. In this view, the bridge's structural lines combine in distinct visual patterns, contrasting dramatically with the foliage of the mature eucalyptus trees nearby, the San Francisco Bay, and portions of the East Bay Hills somewhat visible in the background.

From this viewpoint the bridge and trees frame a distant view of the East Bay Hills. This view illustrates a low degree of unity and intactness, given that since construction of the SFOBB ESSSP began, it has been markedly diminished by the presence of SFOBB Transition Structure construction activity occurring in the center of the view.

KEY VIEWPOINT 3 – OFFICERS' QUARTERS OPEN SPACE

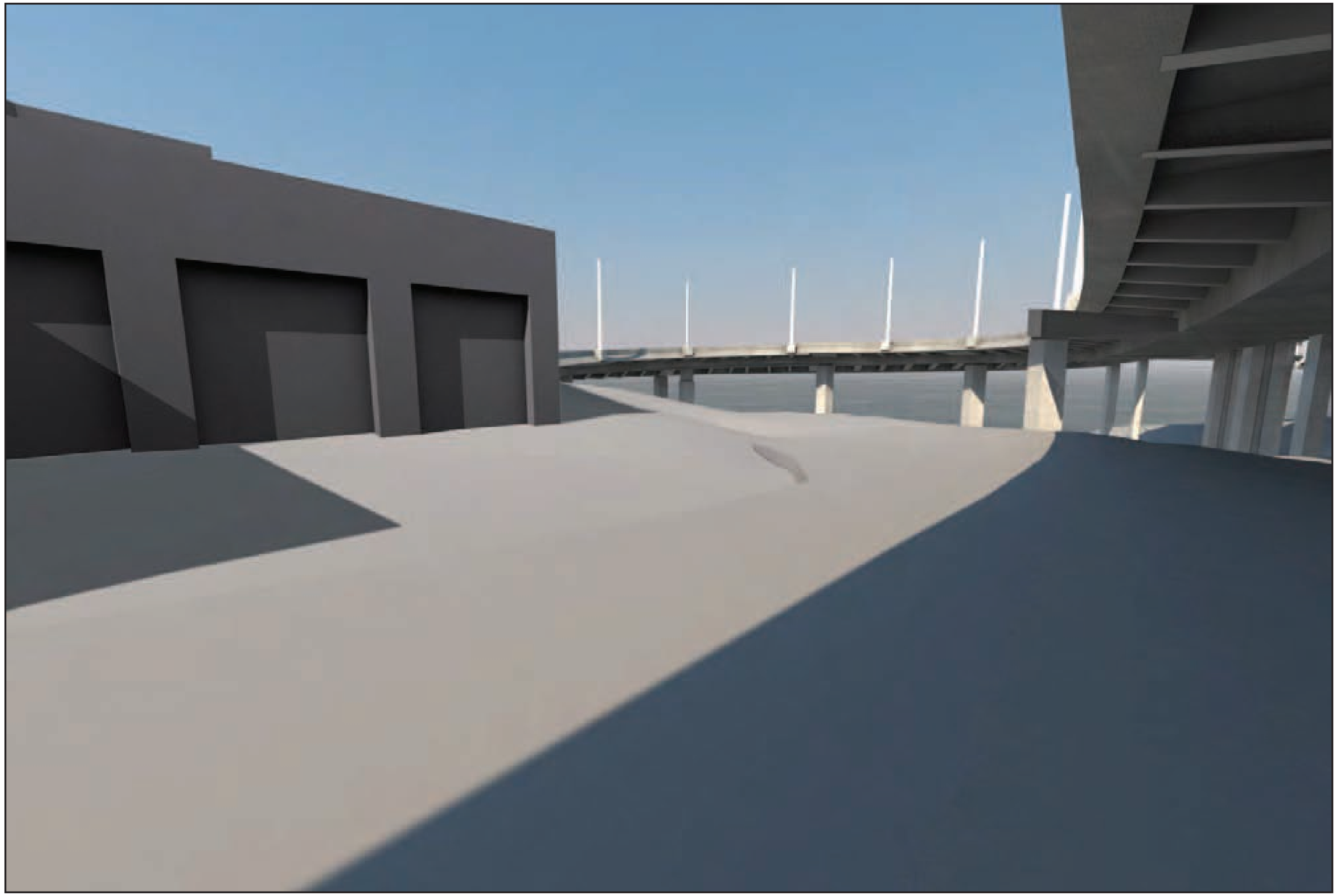
Orientation. This key viewpoint looks southeast from a large open space area between Quarters 4 and Quarters 7 toward other historic U.S. Navy structures that include the Nimitz House (Quarters 1), Quarters 2, Building 83, and Building 205. Figure 3.7-5 depicts a view of existing conditions from this viewpoint.

Landscape Unit. Greater YBI landscape unit.

Viewer Groups. This viewpoint represents a typical view experienced by YBI residents and recreational users.

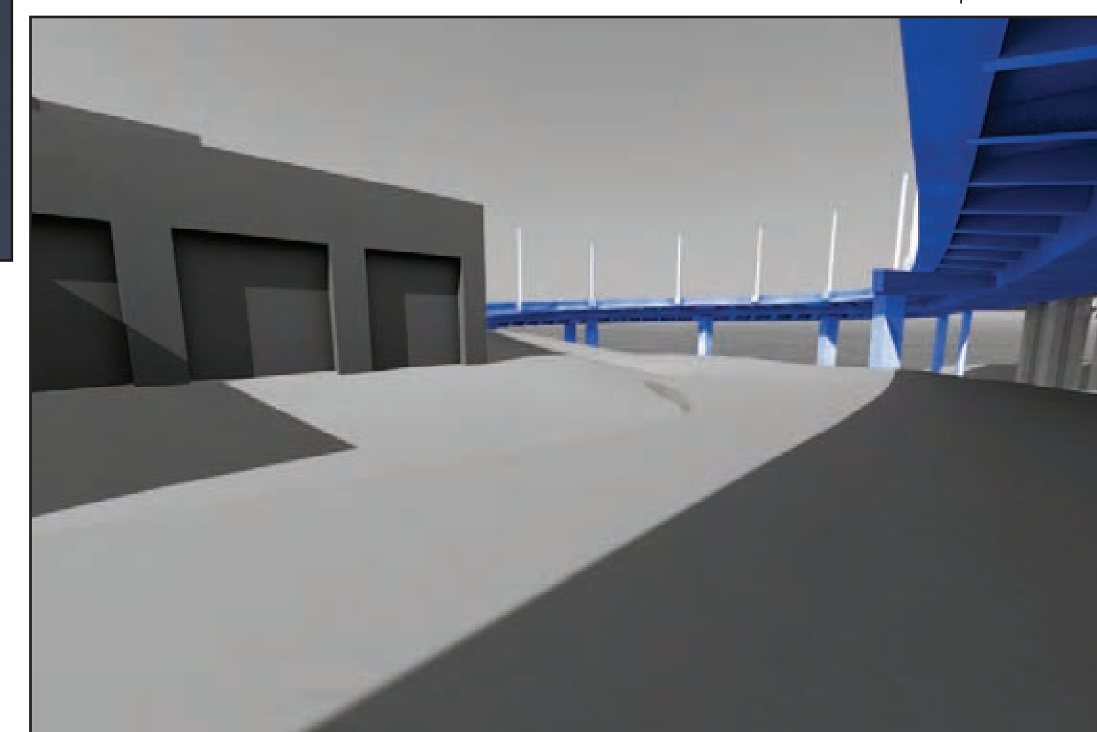
Existing Visual Quality/Character. This viewpoint presents a moderate to highly vivid scene. Various former U.S. Navy structures stand among lush vegetation, while a segment of the SFOBB East Span is visible in the background. In the view, design elements of the U.S. Navy structures can be clearly distinguished and the lines of the SFOBB East Span structure are also vivid.

From this viewpoint, the U.S. Navy structures and the SFOBB East Span are moderately intact and unified. They overlap and obscure each other in space, but not in a way that is inharmonious. The existing vegetation also significantly obscures the buildings and the SFOBB East Span, but the result is that these objects appear to visually complement each other. The area's visual quality is also enhanced by a large open space area, visible in the viewpoint's foreground.



Rendered View

Building 267
to be removed as part of Alt. 2B



Alternative 2B Ramp Components: Blue highlighting distinguishes Alternative 2B ramp components from SFOBB East Span project components

Geographic Context
Indicates distance from viewpoint to Alternative 2B ramp components

Figure 3.7-3
Alternative 2b Key Viewpoint 1: Macalla Road at North Gate Road Intersection

Simulated View

Existing View

Alternative 2B Ramp Components: Blue highlighting distinguishes Alternative 2B ramp components from SFOBB East Span project components

Geographic Context
Indicates distance from viewpoint to Alternative 2B ramp components

Figure 3.7-4
Alternative 2b Key Viewpoint 2: Nimitz House

Simulated View

Existing View

Alternative 2B Ramp Components: Blue highlighting distinguishes Alternative 2B ramp components from SFOBB East Span project components

Geographic Context
Indicates distance from viewpoint to Alternative 2B ramp components

Figure 3.7-5
Alternative 2b Key Viewpoint 3: Officer's Quarters Open Space

KEY VIEWPOINT 4 – NORTH GATE ROAD STAGING AREA

Orientation. This key viewpoint looks southwest across a construction staging area just northeast of North Gate Road that is being used for the SFOBB ESSSP. The Nimitz House and thick vegetation in its vicinity are visible in the background. Figure 3.7-6 depicts a view of existing conditions from this viewpoint.

Landscape Unit. Northeast YBI landscape unit.

Viewer Groups. This viewpoint represents a typical view experienced by YBI residents and recreational users.

Existing Visual Quality/Character. Viewpoint 4 presents a low to moderately vivid image of a construction staging area in the foreground and the Nimitz House situated among mature vegetation visible in the background. Though the image of the Nimitz House and thick vegetation is scenic, the scattered construction materials in the foreground detract from the more vivid features of the scene. The new piling visible in the left side of the frame and the fragmented view of the East Span also detract from the more scenic parts of the view.

In its present state, this viewpoint is characterized as having low unity and intactness. The disturbed nature of the area, due to the presence of the SFOBB ESSSP construction staging area, has degraded the intactness and unity of the view.

KEY VIEWPOINT 5 – TREASURE ISLAND

Orientation. Viewpoint 5 is a view of YBI looking southeast from the southern shore of TI. Figure 3.7-7 depicts a view of existing conditions from this viewpoint.

Landscape Unit. Bay Water/Shoreline landscape unit.

Viewer Groups. This viewpoint represents a typical view experienced by recreational users (users of TI marina).

Existing Visual Quality/Character. The view from TI to YBI from this location is moderately vivid. Due to the distance from the bridge, its structural lines are not as evident compared to views seen from locations on YBI. Also, the island's vegetation appears more homogeneous because it is not possible to distinguish between different types of vegetation from this distance. However, the contrast between the form of YBI and the line of the Bay shore touching the island is a vivid characteristic of this view, as is the image of the SFOBB touching down on the island.

From this viewpoint, the island has moderate intactness and unity. Only portions of the island and the SFOBB East Span are visible to the viewer. However, the Bay waters do provide a sense of visual coherence and compositional harmony, balancing the lack of complete images of the island and the SFOBB.

KEY VIEWPOINT 6 – EASTERN YBI WATERBORNE APPROACH

Orientation. This viewpoint illustrates a westward view of YBI as if on a waterborne approach to the island. This viewpoint is based about 152 meters (498.7 feet) east of the island. Figure 3.7-8 depicts a view of existing conditions from this viewpoint.

Landscape Unit. Bay Water/Shoreline landscape unit.

Viewer Groups. This viewpoint represents a typical view experienced by recreational users and USCG personnel.

Existing Visual Quality/Character. This view of a waterborne approach to the part of YBI occupied by the USCG provides a high level of vividness for the viewer. From this vantage point, it is possible to very clearly see the structural lines of the SFOBB East Span as it connects to YBI, and it is also possible to observe the structural lines of the temporary Transition Structure currently being built as part of the SFOBB ESSSP. This is a dramatic view of the connection between YBI and the SFOBB.

However, this view does not offer the observer a very unified or intact image of the island, of the bridge, or of the USCG facility. Each of these objects is truncated for the viewer, with little visual context to provide information about what lies beyond the frame.

KEY VIEWPOINT 7 – SFOBB OAKLAND TOUCHDOWN

Orientation. This key viewpoint looks west toward YBI from the SFOBB Oakland Touchdown area, which is located about 2 kilometers (1.24 miles) from the island. Figure 3.7-9 depicts a photo-simulation of Alternative 2b from this viewpoint.

Landscape Unit. Bay Water/Shoreline landscape unit.

Viewer Groups. This viewpoint represents a typical view experienced by recreational users.

Existing Visual Quality/Character. This long-range view of the project site from the SFOBB Oakland Touchdown is a vivid perspective of YBI in the context of its surroundings. From this vantage point, the viewer’s attention is focused in large part on the SFOBB East Span crossing the Bay from Oakland to San Francisco. YBI is visible, but only as a distant landmass at the end of the SFOBB East Span. From this point of view it is not even clear that YBI is an island, but it is possible to place it visually in the context of setting elements in its vicinity.

This is a highly unified and intact perspective of YBI. From the Oakland Touchdown, an observer can clearly see a large part of the island’s landmass, though as mentioned before, an uninitiated viewer would not necessarily realize it is an island. Nevertheless, the presence of a large part of the SFOBB East Span in the frame, as well as small glimpses of the West Span, downtown San Francisco skyscrapers, and buildings on TI, results in a very intact and unified scene.

KEY VIEWPOINT 8 – SFOBB TRANSITION STRUCTURE

Orientation. This viewpoint, shown in Figure 3.7-10 is toward the southwest from the future roadway of the SFOBB East Span as it approaches the YBI tunnel. No image of existing conditions is shown, given that this viewpoint does not currently exist.

Landscape Unit. Bay Water/Shoreline landscape unit.

Viewer Groups. This viewpoint represents a typical view experienced by freeway travelers.

Simulated View

Existing view is a composite of two images, resulting in natural lens and perspective distortion. Perspective correction was used to produce the simulated view

Alternative 2B Ramp Components: Blue highlighting distinguishes Alternative 2B ramp components from SFOBB East Span project components

Geographic Context
Indicates distance from viewpoint to Alternative 2B ramp components

Figure 3.7-6
Alternative 2b Key Viewpoint 4: North Gate Road Staging Area

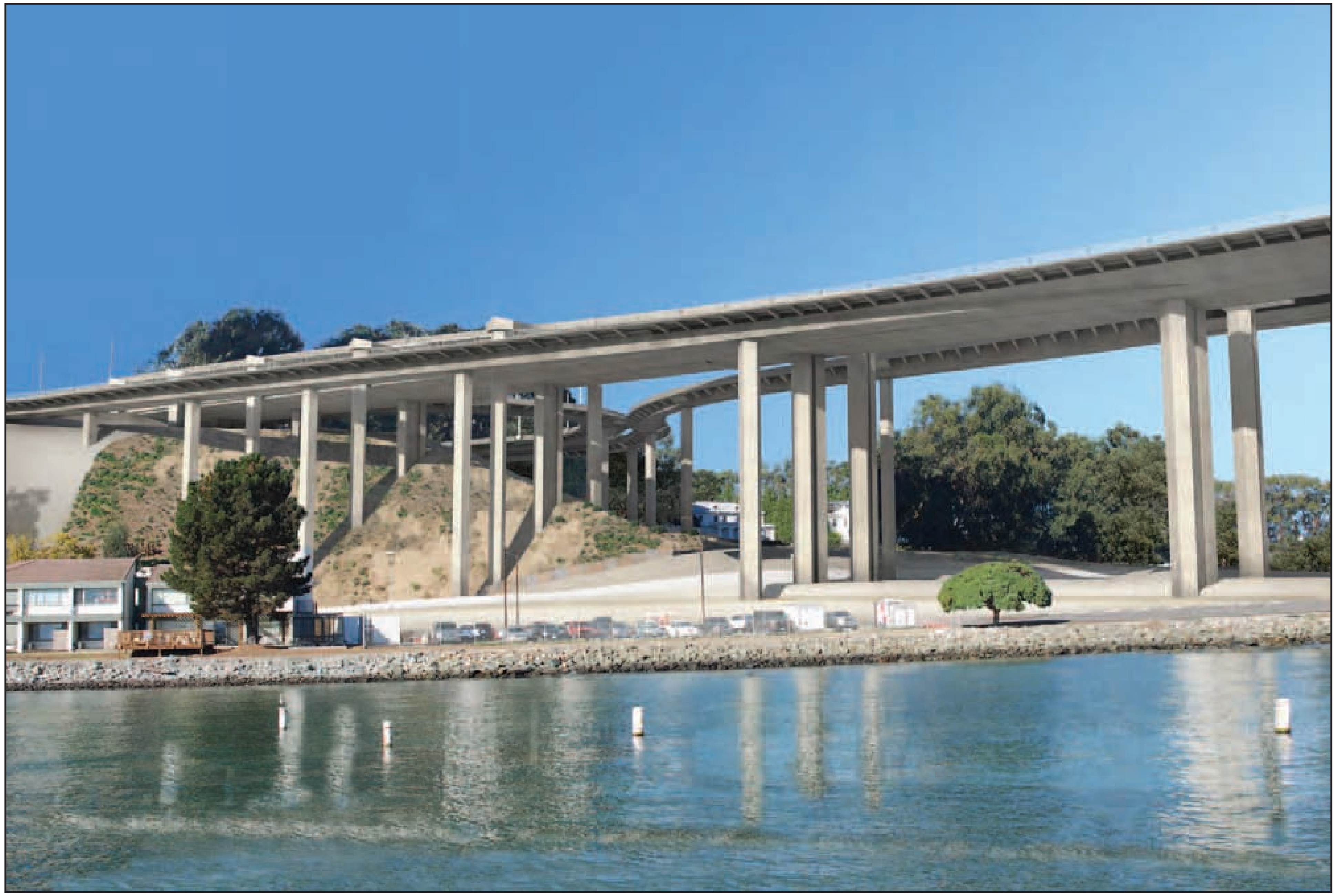

Simulated View


Existing View

Geographic Context
Indicates distance from viewpoint to Alternative 2B ramp components


Alternative 2B Ramp Components: Blue highlighting distinguishes Alternative 2B ramp components from SFOBB East Span project components

Figure 3.7-7
Alternative 2b Key Viewpoint 5: Treasure Island



Simulated View

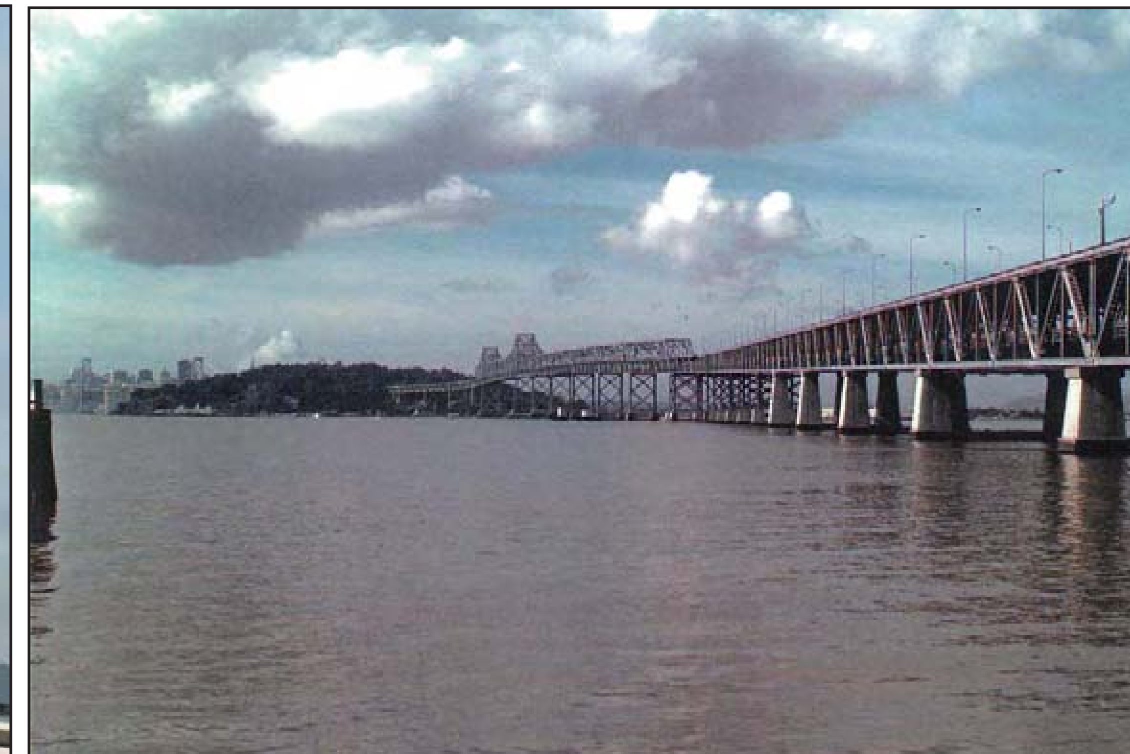
Existing View

Geographic Context
Indicates distance from viewpoint to
Alternative 2B ramp components

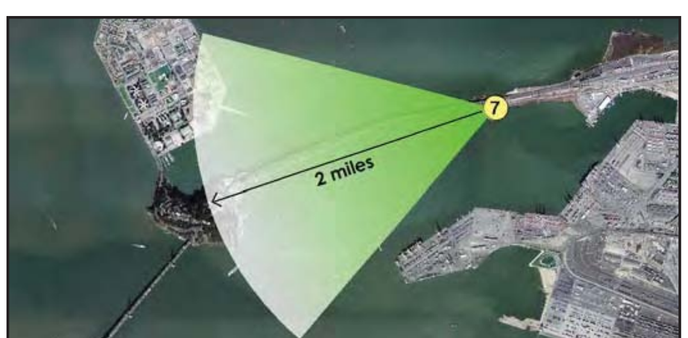
Alternative 2B Ramp Components: Blue highlighting distinguishes Alternative 2B ramp components from SFOBB East Span project components

Figure 3.7-8
Alternative 2b Key Viewpoint 6: Eastern Yerba Buena Island Waterborne Approach

Simulated View



Existing View



Geographic Context
Indicates distance from viewpoint to
Alternative 2B ramp components

Alternative 2B Ramp Components: Blue highlighting distinguishes Alternative 2B ramp components from SFOBB East Span project components

Figure 3.7-9
Alternative 2b Key Viewpoint 7: Oakland Touchdown

Rendered View

Alternative 2B Ramp Components: Blue highlighting distinguishes Alternative 2B ramp components from SFOBB East Span project components

Geographic Context
Indicates distance from viewpoint to Alternative 2B ramp components

Figure 3.7-10
Alternative 2b Key Viewpoint 8: San Francisco-Oakland Bay Bridge Transition Structure

Existing Visual Quality/Character. Because construction of the new SFOBB East Span is not yet complete, and this vantage point is from the future East Span roadway, it is not possible to describe the existing visual character of this viewpoint.

3.7.3 Environmental Consequences

3.7.3.1 Temporary Impacts

NO BUILD ALTERNATIVE

Under the No Build Alternative the existing on- and off-ramps would remain and no new ramps would be built. Existing landscaping and vegetation would not be removed and no construction would occur. The No Build Alternative would not result in an adverse change in the visual character of the study area.

ALTERNATIVE 2B AND ALTERNATIVE 4

During the project's construction period, both build alternatives would result in an adverse change in the visual character of the study area. All build alternatives would require the removal of existing landscaping and vegetation during construction, resulting in a significant visual impact. For all build alternatives, construction equipment, including portable construction lighting, may be present during the construction period. At times, residents living near the construction area may experience increased light and glare from temporary lighting sources at night due to the scheduling of nighttime construction work. This light and glare could be more visible due to the removal of existing vegetation. Light and glare from nighttime construction lighting would have an adverse effect, given that it would be temporary in duration. In addition, portable construction lighting would be required to be down-focused and oriented away from residential areas whenever feasible to reduce potential nighttime disturbance.

3.7.3.2 Permanent Impacts

The criteria used to determine effects on viewers include: visual dominance of the project; view obstruction or view expansion; effects on community disruption; viewer orientation; and design quality issues, such as changes in vividness, intactness and unity. For purposes of this analysis, changes in visual character are categorized as:

- Strongly Beneficial: substantial visual change and considerable increase in the overall visual quality, with the likelihood of strongly positive viewer responses.

- Beneficial: moderate degrees of visual change and an increase in the overall visual quality, with the likelihood of positive viewer responses.

- Minimally Beneficial: tangible visual changes and a minimal increase in overall visual quality, with the likelihood of moderately positive viewer responses.

- Negligible: little or no visual change and no tangible reduction or increase in visual quality, without negative or positive viewer responses expected.

- Minimally adverse: a tangible degree of visual change and a minimal reduction in overall visual quality, with the likelihood of some moderately negative viewer responses.
- Adverse: moderate degrees of visual change and a reduction in the overall visual quality, with the likelihood of negative viewer responses.
- Strongly Adverse: substantial visual change and considerable reduction in the overall visual quality, with the likelihood of strongly negative viewer responses.

NO BUILD ALTERNATIVE

Under the No Build Alternative the existing on- and off-ramps would remain and no new ramps would be built. Existing landscaping and vegetation would not be removed and no construction would occur. The No Build Alternative would not result in a permanent adverse change in the visual character of the study area.

ALTERNATIVE 2B

The following section discusses the impacts of Alternative 2b at each of the eight viewpoints.

Key Viewpoint 1 – Macalla Road at North Gate Intersection

<u>Proposed Project Features</u>. Implementation of Alternative 2b would require the removal of some vegetation currently visible in the view (in the area immediately right of Building 267) to provide right-of-way for the ramps. A viewer at this location would see the on-ramp overhead as it descends toward Macalla Road. Figure 3.7-3 depicts a rendering of Alternative 2b from this viewpoint.

<u>Change to Visual Quality/Character</u>. Though the ramps would be somewhat obstructed by existing foreground vegetation, they nevertheless would be the dominant visual feature of this viewpoint. From this vantage point, the ramps' massing would be visible immediately overhead as well as in the distance as they loop across the viewer's line of sight, though portions would be obscured by existing vegetation and the existing substation building.

Though the ramps' massing would be considerable, they would not be out of character with the current visual setting. Construction of the ramps would involve clearing of some vegetation from the area, which would open up partial views of San Francisco Bay. Though this clearing would provide new views of the Bay, the ramps would also partially obstruct these views.

Though new views of the Bay would become available and the ramps would be partially obstructed by the site's existing vegetation, a significant portion of their massing would tower over viewers situated at this location. Although the project would cause an adverse change, it would not be substantial, given the nature of the existing visual setting. The change in visual quality and character would be minimally adverse and overall viewer response would not be substantially affected.

Key Viewpoint 2 – Nimitz House

Proposed Project Features. Project features visible in this view would include two columns in the right foreground that would support the off-ramp. A portion of the off-ramp would also be visible overhead. Figure 3.7-4 depicts a photo-simulation of Alternative 2b from this viewpoint.

Change to Visual Quality/Character. The structural elements added under Alternative 2b would contribute to the overall dominance of the new SFOBB Transition Structure. However, elements of the new SFOBB Transition Structure would comprise most of the new right-of-way visible from this viewpoint, while a smaller visually subordinate portion, visible in the foreground, would form a part of the YBI off-ramp. The off-ramp would be visually subordinate to other elements in the setting.

Implementation of Alternative 2b would result in a partial increase in view obstruction. Two new support columns for the off-ramp and a portion of the off-ramp roadway would partially obstruct views to the east. However, this obstruction would be minimal relative to elements of the SFOBB Transition Structure that would also obstruct eastward views.

Changes to the vividness of the view resulting from construction of the off-ramp would be minimal compared to the effect the future SFOBB Transition Structure would have on this viewpoint's vividness. Changes to the view resulting from Alternative 2b would not significantly affect the compositional harmony of the larger viewshed, and very little change in the unity and intactness of the area would result.

Viewers at this location would tend to linger for relatively extended periods of time, given that a good number of them would be at the location to attend special events such as weddings. However, this alternative's relatively minor effect on the view's visual quality would not be substantial. Against the backdrop of the SFOBB, the visual change of the project would be minimally adverse.

Key Viewpoint 3 – Officers' Quarters Open Space

Proposed Project Features. Project features visible in this view include a northern portion of the on-ramp, a southern portion of the off-ramp, and a total of eight support columns. Figure 3.7-5 depicts a photo-simulation of Alternative 2b from this viewpoint.

Change to Visual Quality/Character. The structural elements added under Alternative 2b would contribute to the overall dominance of the new SFOBB Transition Structure. The project's on-ramp and off-ramp structures would visually dominate other objects in the setting.

New columns and other structural elements of the on-ramp and off-ramp built as part of this alternative would obstruct views of the SFOBB East Span structure, but would not obstruct views of the U.S. Navy structures, which would remain visible in the foreground.

Changes associated with this alternative would result in a negative effect on the existing vividness of the area, due to the necessary removal of mature vegetation that would be replaced by the ramp structures. The addition of the off-ramp and on-ramp to this view would result in a lowering of the view's intactness and unity. The on-ramp and off-ramp structures would reduce the level of visual harmony that is currently visible from this viewpoint, resulting in an overall strongly adverse change to visual quality. Viewers at this location would tend to travel through the area at a relatively slow speed, given that they would be walking or bicycling, or they would remain relatively stationary as they recreate in the open space area. Therefore, this alternative's adverse visual effects would be felt strongly by people at this location.

Overall viewer response and change in visual character would be strongly adverse and the resulting visual impact would be strongly adverse.

Key Viewpoint 4 – North Gate Road Staging Area

Proposed Project Features. Project features that would be visible from this viewpoint include large portions of the semicircular on-ramp and off-ramp structures, along with seven ramp support columns placed in the near vicinity of the Nimitz House. The Macalla Road retaining wall would not be visible from this viewpoint due to the low viewing angle relative to Macalla Road. Figure 3.7-6 depicts a photo-simulation of Alternative 2b from this viewpoint.

Change to Visual Quality/Character. The structural elements of the off-ramp and on-ramp would be equally dominant with elements of the SFOBB East Span. The YBI ramp structures would tower over and visually overshadow the Nimitz House.

The proposed ramps would result in a partial obstruction of views toward the Nimitz House, but none of the ramps' structural elements would obstruct the Nimitz House.

Changes associated with this alternative would moderately affect the area's existing vividness, due to the partial blockage of views toward the Nimitz House and the loss of a significant amount of mature vegetation behind the Nimitz House. The ramp structures associated with this alternative would further reduce the already low level of intactness and unity in this area. This alternative would result in an overall adverse change to the area's visual quality.

Overall viewer response and change in visual character would be adverse and the resulting visual impact would be adverse. Currently, relatively few people observe this view. However, over the long term, once construction activity end and the TI/YBI Redevelopment Plan is implemented, more people may see the area from this viewpoint (the area is proposed as Open Space). These viewers would be adversely affected by the low visual quality of the area.

Key Viewpoint 5 – Treasure Island

Proposed Project Features. From this vantage point, about 0.8 kilometer (0.5 mile) from the project site, visible project features would include a thin ribbon-like portion of the off-ramp and four support columns. From this perspective, it would not be possible to see features of the on-ramp. Figure 3.7-7 depicts a photo-simulation of Alternative 2b from this viewpoint.

Change to Visual Quality/Character. The off-ramp would be visually subordinate in this viewpoint when compared to other elements in the area, and the on-ramp would not be evident. Though the off-ramp support columns and road deck would be noticeable, they would be less dominant than the future SFOBB Transition Structure, the temporary Transition Structure, SFOBB East Span, San Francisco Bay waters, and the YBI land mass.

The ramp structures proposed as part of Alternative 2b would result in a minimal obstruction of elements currently visible from this vantage point. The ramps and columns would be situated such that their profile would nearly mirror the profile of the future SFOBB Transition Structure. To the casual observer, the YBI ramps would not stand out in a distinctive way.

This alternative would have a negligible effect on the area's overall visual quality. Overall viewer response and change in visual character would be negligible. The resulting visual impact would be negligible.

Key Viewpoint 6 – Eastern YBI Waterborne Approach

Proposed Project Features. From this vantage point, a viewer would see a portion of the future SFOBB East Span Transition Structure in the foreground as it approaches the northeastern tip of YBI. In the background, behind the Transition Structure and its support columns, some portions of the YBI off-ramp and on-ramp and several columns would be visible. Figure 3.7-8 depicts a photo-simulation of Alternative 2b from this viewpoint.

Change to Visual Quality/Character. The YBI ramps design for Alternative 2b would be visually subordinate in this viewpoint when compared to other elements in the area. Though the YBI ramp columns and road decks would be noticeable, they would be less dominant than the future SFOBB Transition Structure, primarily because the ramps would be partially obstructed by it.

From this viewpoint, the ramp structures would be largely obstructed by the island's landmass and by the SFOBB Transition Structure. Against the backdrop of the SFOBB, the visual change of the project would be minimal. The ramps would obstruct existing vegetation and the U.S. Navy buildings in the background.

Implementation of this alternative would not result in a high degree of change to the area's vividness. The YBI ramps would be noticeable but not dominant from this viewpoint. Overall change in viewer response and visual character and the resulting visual impact would be minimally adverse.

Key Viewpoint 7 – SFOBB Oakland Touchdown

Proposed Project Features. At such a distance from YBI, viewers at the Oakland Touchdown area would have difficulty discerning the ramp project's features, though some ramp features would be slightly visible among a grouping of SFOBB Transition Structure columns and the SFOBB East Span. Figure 3.7-9 depicts a photo-simulation of Alternative 2b from this viewpoint.

Change to Visual Quality/Character. Alternative 2b's ramps would not be evident from the Oakland Touchdown area, due to the relatively long distance to YBI. From this vantage point, the ramps would be difficult to discern by the casual viewer. As shown in the Alternative 2b Ramp Components inset of Figure 3.7-9, the ramps would be so indiscernible that the blue highlighting used to distinguish the ramps is not visible.

The ramp structures designed for this alternative would result in very minimal view obstruction. From this vantage point, the ramps would be difficult to discern by the casual viewer, yet they would nevertheless contribute to the partial obstruction of YBI that the SFOBB produces for Oakland Touchdown viewers. From this vantage point, elements of the YBI ramps and the SFOBB, especially their support columns, appear to meld together in a dense cluster, making it difficult to distinguish elements of the ramps from elements of the SFOBB. Obstruction that is attributable to the YBI ramps would be minimal.

From this vantage point, the structural elements associated with Alternative 2b would be difficult for the casual viewer to discern. Therefore, the overall change in visual quality resulting from this alternative would be negligible.

Overall change in viewer response and visual character would be negligible. The resulting visual impact would be negligible.

Key Viewpoint 8 – SFOBB Transition Structure

Proposed Project Features. From this vantage point, a motorist approaching YBI would see only a very small portion of the off-ramp and five of its light standards near the viewer's line of sight vanishing point. No portion of the on-ramp would be visible. Figure 3.7-10 depicts a photo-simulation of Alternative 2b from this viewpoint.

Expected Visual Quality/Character. From this viewpoint, the project would have a subordinate visual effect from the perspective of motorists approaching the ramp structures. A small sliver of the off-ramp would be visible in the center of the view. The most dominant features visible to the viewer would be the SFOBB Transition Structure roadway as it extends into the distance, as well as the YBI landmass.

The off-ramp would be almost imperceptible from this vantage point and any view obstruction attributable to the ramp would be negligible.

This is a view illustrating the perspective of a motorist crossing the SFOBB East Span Transition Structure and approaching the YBI Tunnel. From this location, the off-ramp would not be a prominent element of the view seen by motorists. The off-ramp would be a subordinate element in the view, and any effect this alternative would have on the overall visual quality of the area would be negligible.

Overall change in viewer response and visual character would be negligible. The resulting visual impact would be negligible.

ALTERNATIVE 4

The following section discusses the impacts of Alternative 4 at each of the eight viewpoints.

Key Viewpoint 1 – Macalla Road at North Gate Road Intersection

Proposed Project Features. Project features visible from this vantage point include the terminus of the off-ramp as it touches down onto the island at the intersection of Macalla Road and North Gate Road, as well as a short stretch of the on-ramp running over the terminus of the off-ramp. Figure 3.7-11 depicts a rendering of Alternative 4 from this viewpoint.


Rendered View

Geographic Context
Indicates distance from viewpoint to Alternative 4 ramp components

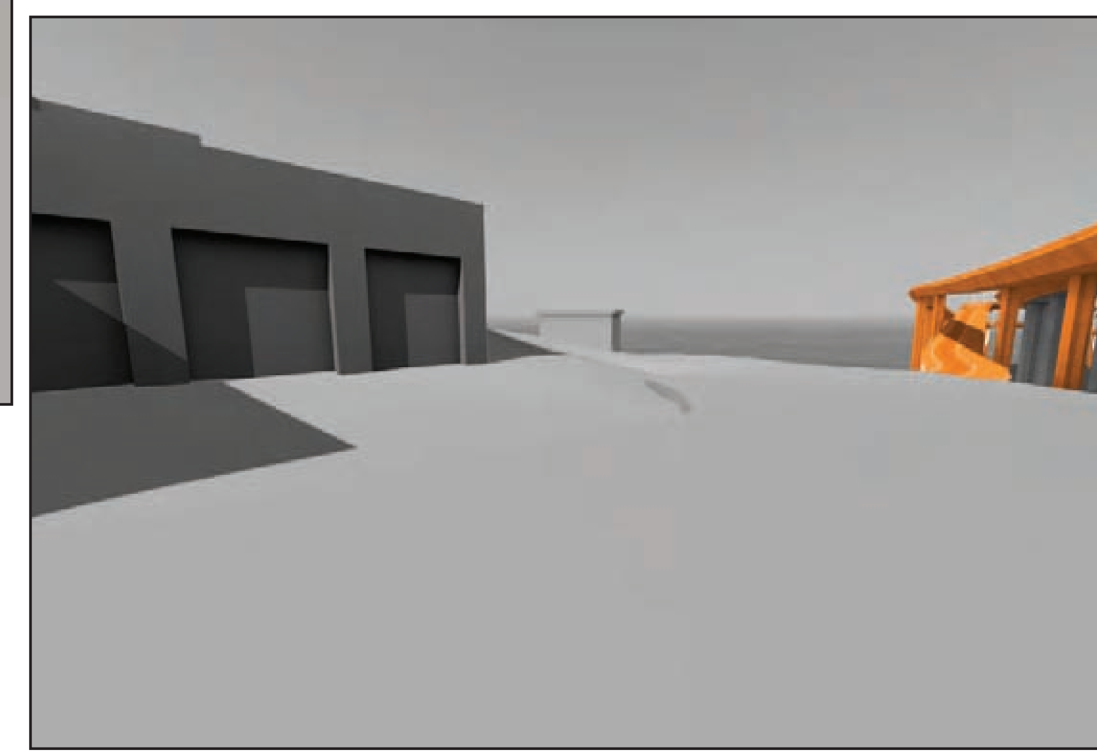

Alternative 4 Ramp Components: Orange highlighting distinguishes Alternative 4 ramp components from SFOBB East Span project components

Figure 3.7-11
Alternative 4 Key Viewpoint 1: Macalla Road at North Gate Road Intersection

Change to Visual Quality/Character. The ramp elements associated with Alternative 4 would be equally dominant in the view relative to other area features, in that the substation, existing vegetation and the ramps would all vie for the viewer's attention.

Construction of the ramps would involve clearing of some vegetation from the area, which would open up partial (very minimal) views of San Francisco Bay. Though this clearing would provide new views of the Bay, the ramps would also partially obstruct these views.

On the whole, this alternative would have a minimally adverse effect on visual quality, given that overall viewer response would not be substantially affected. Construction of the ramps would do little to harmonize the relationship between the transportation infrastructure of YBI and its surrounding natural environment, but the ramps would not reduce existing visual quality. In addition, new views of the Bay would become available, though these would be quite minimal. The resulting visual impact would be minimally adverse.

Key Viewpoint 2 – Nimitz House

Proposed Project Features. Project features visible in this view include a large portion of the on-ramp as its passes underneath the future SFOBB Transition Structure from right to left making its way toward the Nimitz House. Also visible is a short stretch of the off-ramp as it descends on its path to the intersection of Macalla Road and North Gate Road, out of view behind the Nimitz House. The on-ramp is the leftmost road deck visible in the viewpoint, while the off-ramp is situated immediately to the right of the on-ramp. Figure 3.7-12 depicts a photo-simulation of Alternative 4 from this viewpoint.

Change to Visual Quality/Character. The future SFOBB Transition Structure would extend farther left into the viewer's line of sight than the existing SFOBB East Span structure. The YBI on-ramp would loop under the SFOBB Transition Structure and travel toward the viewer as it makes its way in a southwesterly direction toward an eventual connection with the Transition Structure. (The viewer would need to turn completely around to see this connection.) From this viewpoint, the off-ramp and on-ramp would be equally dominant with the future SFOBB Transition Structure.

This alternative would result in a partial obstruction of views toward the East Bay Hills. However, the level of obstruction would be considered less than that caused by the road decks and columns of the SFOBB ESSSP visible from this vantage point.

This alternative would result in an overall adverse effect on the visual quality of the viewpoint. Though most viewers observing from this viewpoint would experience it on a temporary basis, the type of special events they would attend at the Nimitz House would usually benefit from an ambience of high visual quality. This alternative would lead to a further reduction of visual quality in addition to the reduction that is attributable to the physical elements of SFOBB ESSSP.

Overall change in viewer response and visual character would be minimally adverse based on the much larger change in visual character attributable to the physical elements of the SFOBB ESSSP. The resulting visual impact would be minimally adverse.

Key Viewpoint 3 – Officers' Quarters Open Space

Proposed Project Features. Project features visible in this view include a short stretch of the on-ramp as it passes over North Gate Road on the east side of the SFOBB Transition Structure. A larger portion of the on-ramp located west of the Transition Structure would also be visible, as would a small stretch of the off-ramp as it nears its terminus at North Gate Road and Macalla Road. Portions of three YBI ramp columns supporting the ramps would also be visible. Figure 3.7-13 depicts a photo-simulation of Alternative 4 from this viewpoint.

Change to Visual Quality/Character. The structural additions associated with this alternative would be equally dominant with other features of the view. The massing of the off-ramp and on-ramp would pass across the viewer's line of sight, roughly paralleling the massing of the double-decked SFOBB Transition Structure. The visual dominance of the YBI ramps would be fairly equal to the dominance of the Transition Structure.

New columns and other structural elements of the on-ramp and off-ramp would obstruct views of the SFOBB East Span structure, but would not obstruct views of the U.S. Navy structures, which would remain visible in the foreground.

This alternative would result in an overall minimally adverse effect on the visual quality of the viewpoint. Under current conditions, the SFOBB East Span passes over and behind the U.S. Navy structures, with a left-to-right movement of massing that appears to float elegantly in midair. The Alternative 4 design would involve construction of ramp road decks and columns behind and in front of the SFOBB Transition Structure that would not on the whole present a bulkier image. However, elements of the new design would lend it an overall wider horizontal (ramp decks) and vertical (columns) profile when compared to the image presented by the current bridge structure.

Overall change in viewer response and visual character would be minimally adverse. The resulting visual impact would be minimally adverse.

Key Viewpoint 4 – North Gate Road Staging Area

Proposed Project Features. This viewpoint presents a southwestern view of project features, including nine columns that would support portions of the on-ramp and off-ramp. Portions of the ramp decks are visible, though less prominent, than the dominant massing of the columns. Figure 3.7-14 depicts a photo-simulation of Alternative 4 from this viewpoint.

Change to Visual Quality/Character. Compared to the existing view, the structures proposed in this alternative would markedly dominate the viewer's line of sight. As described above, the ramp support columns would have the most visually dominating effect, while the ramp decks would play a less dominant role.

This alternative would result in a partial, though very large obstruction of the view. The currently unobstructed view of the Nimitz House and the mature vegetation in its vicinity would be considerably obstructed by the columns supporting the proposed ramp decks.

Simulated View

Existing View

Alternative 4 Ramp Components: Orange highlighting distinguishes Alternative 4 ramp components from SFOBB East Span project components

Geographic Context
Indicates distance from viewpoint to Alternative 4 ramp components

Figure 3.7-12
Alternative 4 Key Viewpoint 2: Nimitz House

Simulated View

Existing View

Alternative 4 Ramp Components: Orange highlighting distinguishes Alternative 4 ramp components from SFOBB East Span project components

Geographic Context
Indicates distance from viewpoint to Alternative 4 ramp components

Figure 3.7-13
Alternative 4 Key Viewpoint 3: Officers' Quarters Open Space

Simulated View

Geographic Context
Indicates distance from viewpoint to
Alternative 4 ramp components

Existing view is a composite of two images, resulting in natural lens and perspective distortion. Perspective correction was used to produce the simulated view.

Alternative 4 Ramp Components: Orange highlighting distinguishes Alternative 4 ramp components from SFOBB East Span project components

Figure 3.7-14

Alternative 4 Key Viewpoint 4: North Gate Road Staging Area

The ramp structures would result in a strongly adverse visual effect for viewers observing the area. The scene's visual quality is already at a low level, given the adverse effect produced by the SFOBB ESSSP construction staging area. The view's vividness, intactness, and unity would decline further upon implementation of Alternative 4. Over the long term, upon implementation of the TI/YBI Redevelopment Plan, the construction staging area would be converted to Open Space. It is unlikely that visitors to the Open Space area would be able to avoid views of the YBI ramps. Therefore, it is expected that visual quality in this area would remain at a low level over the long term. Future users of the area would be adversely affected.

Overall change in viewer response and visual character would be adverse. The resulting visual impact would be adverse.

Key Viewpoint 5 – Treasure Island

Proposed Project Features. This viewpoint, compared to others that illustrate the proposed Alternative 4 ramp designs, allows the viewer to observe the ramps nearly in their entirety. From this perspective, the viewer would see almost the entire profile of the off-ramp as it descends from the Transition Structure, as well as almost the entire profile of the on-ramp as it loops underneath the Transition Structure. Figure 3.7-15 depicts a photo-simulation of Alternative 4 from this viewpoint.

Change to Visual Quality/Character. The ramp structures associated with Alternative 4 would be equally dominant in the visual setting. From the southern shore of TI, the viewer would have a nearly "head-on" perspective of the ramps and the ramps would be as visually dominant from this perspective as the SFOBB East Span and the YBI land mass.

The ramp structures would partially obstruct views of the mature vegetation located on the northeastern tip of YBI and would also partially block views of the future SFOBB Transition Structure.

Alternative 4 would adversely affect the visual quality of the area as seen from this vantage point. The view is currently considered moderately vivid, and its unity and intactness are low. As discussed above, the view's positive attributes are counteracted by its negative characteristics, resulting in a relatively neutral level of visual quality. However, the ramp structures associated with this alternative would tip the balance, lessening the area's visual quality. Viewers in this area currently consist of people who work at the Sailing Center facility located along the shoreline and other visitors that pass through this publicly accessible location. The former group would have frequent, long duration views of the project area, and would be susceptible to the adverse effects of this alternative. Visitors would be more transient, though it is assumed they would most likely be in the area for recreational purposes and would also be adversely affected by the view's low visual quality. Over the long term, this area is designated by the TI Development Plan to be the site of recreational open space and residential land uses. These future uses would be adversely affected by the project's visual impact, given that viewers at this location would tend to spend long amounts of time viewing the YBI ramps.

However, when considering the effect of Alternative 4 within the context of changes associated with the SFOBB project, changes in viewer response and visual character resulting from Alternative 4 would be considered negligible. The resulting visual impact would be negligible.

Key Viewpoint 6 – Eastern Yerba Buena Island Waterborne Approach

Proposed Project Features. Project features visible from this viewpoint include a section of the on-ramp located on the southern side of the Transition Structure, a section of the off-ramp structure located on the northern side of the Transition Structure, and support columns. From this viewpoint it is possible to see the on-ramp passing alongside and just below the level of the Transition Structure. The small section of the off-ramp that is visible is descending from the Transition Structure as it makes its way to the intersection of Macalla Road and North Gate Road. Figure 3.7-16 depicts a photo-simulation of Alternative 4 from this viewpoint.

Change to Visual Quality/Character. On a waterborne approach to the USCG facility at YBI, the ramp structures would be equally dominant with other elements of the setting. The on-ramp, visible in front of the SFOBB Transition Structure, and the off-ramp, visible behind it, would visually parallel the equally dominant Transition Structure.

The ramp structures would partially obstruct views of the Transition Structure and would also partially obstruct scant existing views of the Nimitz House and Quarters 2.

Alternative 4 would adversely affect the visual quality of the area. From a viewer's perspective, the on-ramp would cross their line of sight from left to right in front of the SFOBB Transition Structure while the off-ramp would pass behind the Transition Structure. The movement of the ramps has the effect of cluttering and "crowding out" the thin, simple lines of the Transition Structure. Compared to other viewpoints, relatively few people would observe this view. However, a number of these people would be involved in recreational boating activities that would necessitate relatively long exposure to views of the ramps, and their enjoyment of the area would be diminished by the structural elements of Alternative 4.

Overall change in viewer response and visual character would be minimally adverse. The resulting visual impact would be minimally adverse.

Key Viewpoint 7 – SFOBB Oakland Touchdown

Proposed Project Features. Alternative 4 project features are somewhat difficult to discern from features of the SFOBB and its Transition Structure, due to the relatively long distance between the viewer and the YBI ramp structures. Nevertheless, a viewer would be able to identify the on-ramp as it loops underneath and around the Transition Structure. Figure 3.7-17 depicts a photo-simulation of Alternative 4 from this viewpoint.

Change to Visual Quality/Character. From this viewpoint, the Alternative 4 ramp structures would not be evident to the casual viewer. Though the ramps would be visible, the viewer's attention would be drawn to more dominant features of the view, including the SFOBB East Span, YBI, the San Francisco skyline partially visible behind YBI, TI, a portion of Angel Island, and San Francisco Bay.

Simulated View

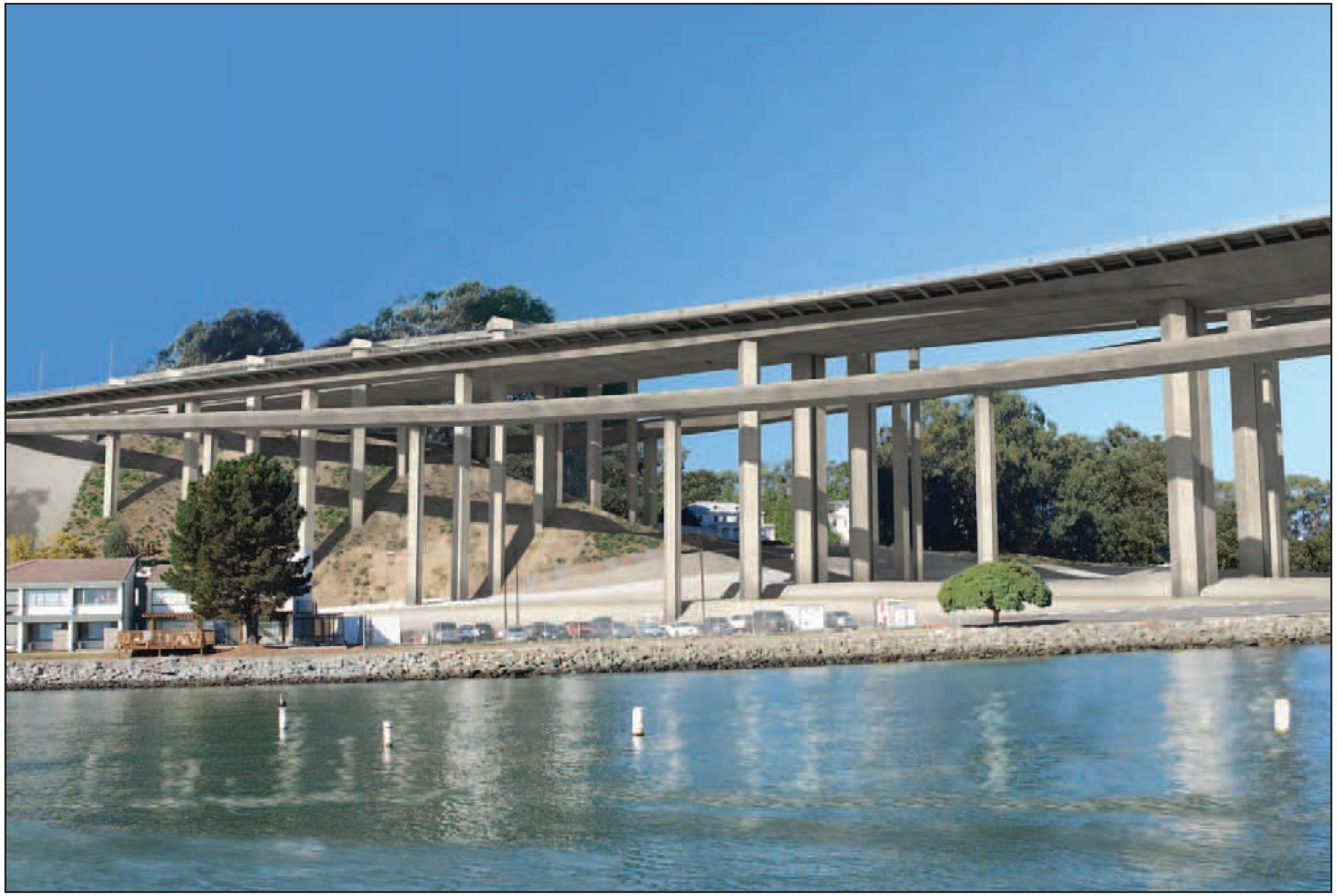
Existing View

Alternative 4 Ramp Components: Orange highlighting distinguishes Alternative 4 ramp components from SFOBB East Span project components

Geographic Context
Indicates distance from viewpoint to Alternative 4 ramp components

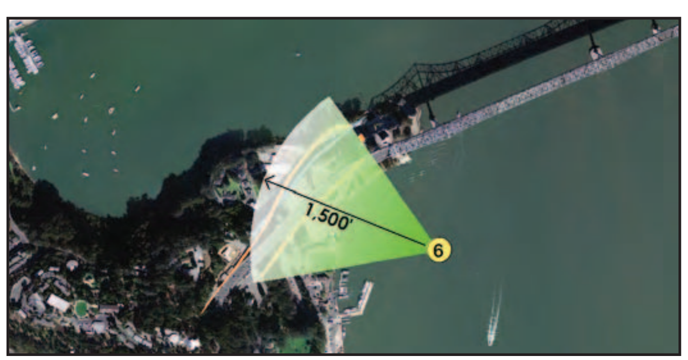
Figure 3.7-15

Alternative 4 Key Viewpoint 5: Treasure Island



Simulated View

Existing View



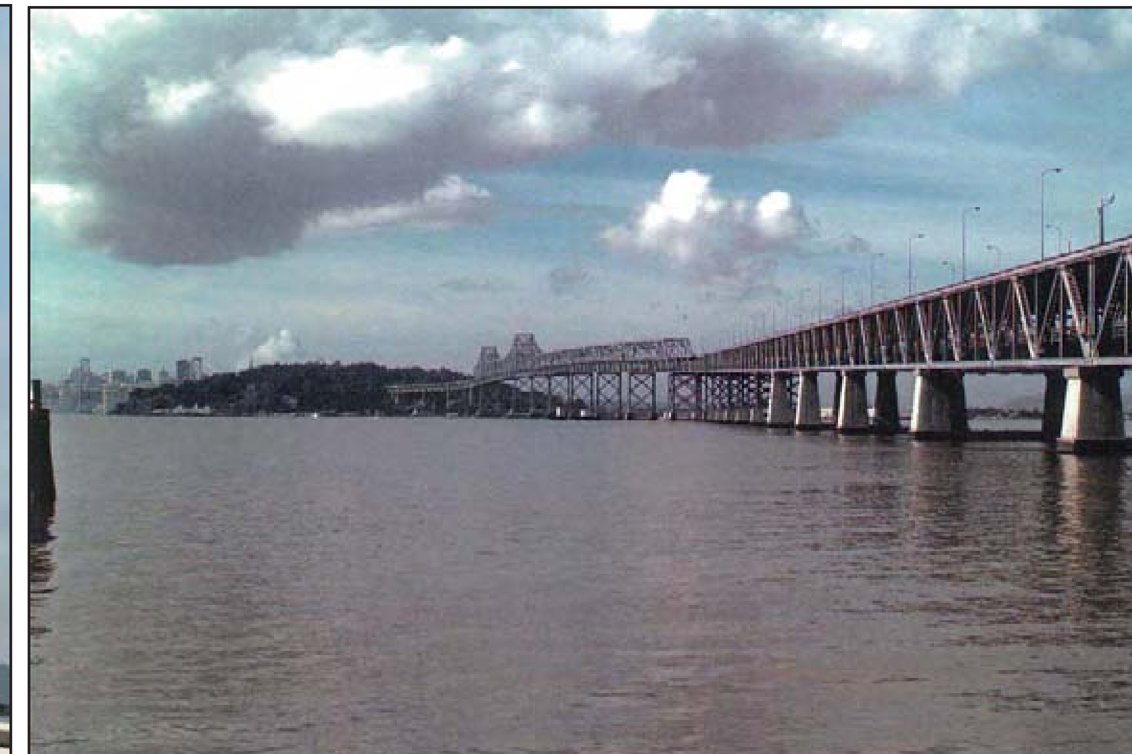
Geographic Context
Indicates distance from viewpoint to Alternative 4 ramp components

Alternative 4 Ramp Components: Orange highlighting distinguishes Alternative 4 ramp components from SFOBB East Span project components

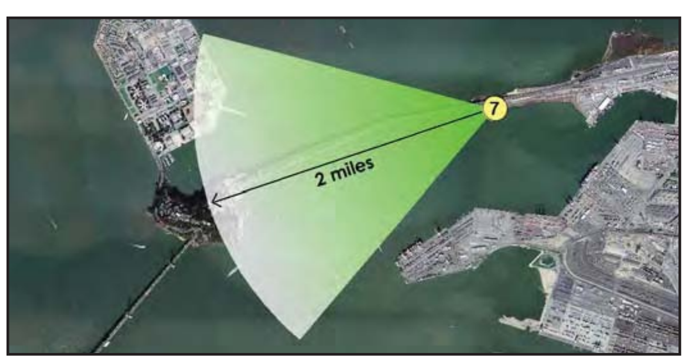
Figure 3.7-16

Alternative 4 Key Viewpoint 6: Eastern Yerba Buena Island Waterborne Approach

Simulated View



Existing View



Geographic Context
Indicates distance from viewpoint to
Alternative 4 ramp components

Alternative 4 Ramp Components: Orange highlighting distinguishes Alternative 4 ramp components from SFOBB East Span project components

Figure 3.7-17

Alternative 4 Key Viewpoint 7: Oakland Touchdown

The ramp structures would minimally obstruct views of the northeastern tip of YBI, but not to a greater extent than obstruction attributable to the existing SFOBB East Span or the future SFOBB East Span structure.

The ramp structures would have an overall negligible effect on the visual quality of the view from the SFOBB Oakland Touchdown. Though the ramps would be visible, they would result in little or no visual change and no tangible reduction or increase in visual quality. No negative or positive viewer response would be expected.

Overall change in viewer response and visual character would be negligible. The resulting visual impact would be negligible.

Key Viewpoint 8 – SFOBB Transition Structure

Proposed Project Features. As motorists approach the YBI tunnel while driving in a westerly direction, from this viewpoint they would see a small portion of the on-ramp as it ascends onto the SFOBB. Figure 3.7-18 depicts a rendering of Alternative 4 from this viewpoint.

Expected Visual Quality/Character. The on-ramp would be visible on the right side of the view as a motorist travels on the SFOBB East Span. From this location, the ramp would be visible but subordinate to other elements of the setting.

The on-ramp would partially obstruct views toward YBI. However, the level of obstruction attributable to the ramp would be relatively minimal compared to the obstruction caused by the SFOBB East Span.

The on-ramp would have an overall negligible effect on the visual quality of the view. Though the ramp would be visible, it would result in little or no visual change and no tangible reduction or increase in visual quality.

Overall change in viewer response and visual character would be negligible. The resulting visual impact would be negligible.

3.7.4 Summary of Project Impacts

Table 3.7-1 provides a concise description of the visual impacts associated with Alternative 2b and Alternative 4 for each viewpoint. Review of the table indicates that Alternative 2b would have a less adverse visual impact on the project area than Alternative 4.

Table 3.7-1: Summary of Project's Visual Quality Impacts

	Alternative 2b	Alternative 4
Key Viewpoint 1	Minimally Adverse	Minimally Adverse
Key Viewpoint 2	Minimally Adverse	Adverse
Key Viewpoint 3	Strongly Adverse	Minimally Adverse
Key Viewpoint 4	Adverse	Adverse
Key Viewpoint 5	Negligible	Adverse
Key Viewpoint 6	Minimally Adverse	Minimally Adverse
Key Viewpoint 7	Negligible	Negligible
Key Viewpoint 8	Negligible	Negligible

In general, ramp features associated with Alternative 2b would have a lesser visual impact than the ramp features associated with Alternative 4.

The project site is not located within a State-designated scenic corridor. Implementation of either build alternative would potentially affect the visual quality of the project site and its vicinity, including neighboring historic structures. Please refer to Section 3.8, Cultural Resources, of this Draft EIR/EIS to learn more about the project's potential impacts on these resources.

3.7.5 Avoidance, Minimization, and/or Mitigation Measures

Caltrans and FHWA mandate that a qualitative/aesthetic approach should be taken to mitigate for visual quality loss in the project area. This approach fulfills the letter and the spirit of FHWA requirements because it addresses the actual cumulative loss of visual quality that would occur in the project viewshed if the project was implemented along with the SFOBB. It also constitutes mitigation that can more readily generate public acceptance of the project.

Visual mitigation for adverse project impacts addressed in the key viewpoint assessments and summarized in the previous section would consist of adhering to the following design requirements in cooperation with the District Landscape Architect.

3.7.5.1 Alternative 2b

Construction of the Alternative 2b design would in some cases have significant impacts on the visual quality of some areas when these areas are observed from certain viewpoints. This would be noticeable in cases where views toward or from the Senior Officers' Quarters Historic District would be dominated and/or obstructed by the ramp structures.

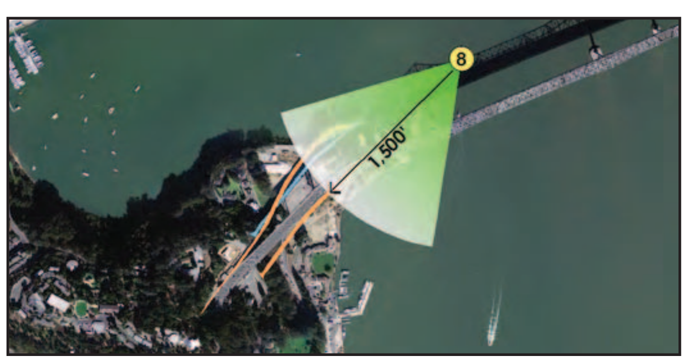
Alternative 2b would require the removal of woodland vegetation, mostly mature eucalyptus trees, within the project's construction limits. Most of the trees that would be removed are located in the area southwest of the Nimitz House, which is where the off-ramp would end and the on-ramp would begin. These are mature tall trees that add to the island's appearance and shield the ramps partially from view. The removal of this vegetation would constitute a substantial visual impact, and a number of years would be required before the vegetation could reestablish itself to the density that exists today.

Given the large scale of the ramps, it would be difficult to screen or sufficiently offset their visual impacts without in the process causing secondary significant visual impacts. Design requirements including ribbing to match the existing and proposed adjacent structures would be implemented under Alternative 2b. To promote a seamless interaction between the ramps and the SFOBB Transition Structure, the ramps would utilize a ribbed design that is consistent with the structural form and architectural vocabulary of the new SFOBB East Span. The intent is to blend the structure such that both components appear to be integrated as one project.

A landscaping plan for the project area would be developed in cooperation with Caltrans' District 4 Landscape Architect and is still being designed. While the goal would be to aesthetically enhance the project site, bridge security may limit the range of options that can be considered. However, some new vegetation will be planted in appropriate

Rendered View

Alternative 4 Ramp Components: Orange highlighting distinguishes Alternative 4 ramp components from SFOBB East Span project components



Geographic Context
Indicates distance from viewpoint to Alternative 4 ramp components

Figure 3.7-18

Alternative 4 Key Viewpoint 8: San Francisco-Oakland Bay Bridge Transition Structure

locations. The landscaping alone will not fully mitigate the visual impact. The landscaping plan would incorporate the use of native plants such as Coast live oak, Toyon, Coyote brush, Snowberry, Blue elderberry, California blackberry, and Miner's lettuce, and would be developed in coordination with Caltrans' SFOBB landscape plan. In addition TIDA's Treasure Island/Yerba Buena Island Development Plan best management practices (BMPs) identified in the Habitat Management Plan would also be considered. The BMPs consist of revegetation, protection of sensitive resource areas, invasive plant removal and prevention, and hazard tree removal. The landscaping plan would be in compliance with the invasive species provisions outlined in the Biological Resources section of this EIR/EIS. In compliance with EO 13112 and subsequent guidance from FHWA, the landscaping and erosion control measures included in the project would not use species listed as noxious or invasive weeds by the California Department of Food and Agriculture.

3.7.5.2 Alternative 4

Construction of the Alternative 4 design would in some cases have significant impacts on the visual quality of some areas when these areas are observed from certain viewpoints. This would be noticeable in cases where views toward or from the Senior Officers' Quarters Historic District would be dominated and/or obstructed by the ramp structures.

Alternative 4 would require the removal of woodland vegetation, mostly mature eucalyptus trees, within the project's construction limits. Most of the trees that would be removed are located in the area at the northeastern tip of YBI southwest. These are mature tall trees that add to the island's appearance and shield the ramps partially from view. The removal of this vegetation would constitute a substantial visual impact, and a number of years would be required before the vegetation could reestablish itself to the density that exists today.

Design requirements including ribbing to match the existing and proposed adjacent structures would be implemented under Alternative 4. To promote a seamless interaction between the ramps and the SFOBB Transition Structure, the ramps would utilize a ribbed design that is consistent with the structural form and architectural vocabulary of the new SFOBB East Span. The intent is to blend the structure such that both components appear to be integrated as one project.

Given the large scale of the ramps, it would be difficult to screen or sufficiently offset their visual impacts without in the process causing secondary significant visual impacts. As described in Section 2.2.4, trees and sensitive plants removed during construction would be replaced with the intent to restore disturbed areas with similar landscape that would screen portions of the ramp structure (i.e. columns, column foundations) from surrounding viewpoints over time, to the extent feasible.

A landscaping plan for the project area would be developed in cooperation with Caltrans' District 4 Landscape Architect and is still being designed. While, the goal would be to aesthetically enhance the project site, bridge security may limit the range of options that can be considered. However, some new vegetation will be planted in appropriate locations. The landscaping plan alone will not fully mitigate the visual impact. The landscaping plan would improve the overall appearance and soften the structure of the ramp and shall incorporate the use of native plants such as Coast live oak, Toyon, Coyote brush, Snowberry, Blue elderberry, California blackberry, and Miner's lettuce, and would be developed in coordination with Caltrans' SFOBB landscape plan. In addition the Treasure Island/Yerba Buena Island Development Plan best management practices (BMPs) identified in the Habitat Management Plan would also be considered. The BMPs consist of revegetation, protection of sensitive resource areas, invasive plant removal and prevention, and hazard tree removal. The landscaping plan would be in compliance with the invasive species provisions outlined in the Biological Resources section of this EIR/EIS. In compliance with EO 13112 and subsequent guidance from FHWA, the landscaping and erosion control measures included in the project would not use species listed as noxious or invasive weeds by the California Department of Food and Agriculture.

3.8 Cultural Resources

Cultural and historic resources provide information about people from the past and establish important connections to the present. They also provide evidence about important historical trends and events; reflect people's everyday lives and accomplishments; and illustrate distinctive architectural, landscape, and engineering designs.

The YBI Ramps Improvement Project area contains a rich collection of cultural resources, including archaeological sites, historic buildings, structures and objects, and cultural landscape features. These include the former Military Base on YBI and its contributing elements, the San Francisco-Oakland Bay Bridge, and a prehistoric archaeological site known as CA-SFR-04/H.

3.8.1 Regulatory Setting

The term "cultural resources" as used in this document refers to all historical and archaeological resources, regardless of significance. Laws and regulations dealing with cultural resources for the Yerba Buena Ramps Improvement Project include the following.

3.8.1.1 National Historic Preservation Act

The National Historic Preservation Act of 1966, as amended, (NHPA) sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the NRHP. Section 106 of NHPA requires Federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council (36 C.F.R. 800). On January 1, 2004, a Section 106 Programmatic Agreement (PA) between the Advisory Council, FHWA, State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 C.F.R. 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA's responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Pilot Program (23 C.F.R. 773) (July 1, 2007).

3.8.1.2 Native American Graves Protection and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act (NAGPRA) governs the treatment of prehistoric Native American human remains discovered on Federal land and the disposition of such remains in possession of the Federal government. Because YBI is a Federal military installation, NAGPRA would govern the treatment of human remains discovered during implementation of the project. NAGPRA provides a process for museums and Federal agencies to return certain Native American cultural items—human remains, funerary objects, sacred objects, or objects of cultural patrimony—to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations. NAGPRA includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American cultural items on Federal and tribal lands, and penalties for noncompliance and illegal trafficking. In addition, NAGPRA authorizes Federal grants to Indian tribes, Native Hawaiian organizations, and museums to assist with the documentation and repatriation of Native American cultural items, and establishes the Native American Graves Protection and Repatriation Review Committee to monitor the NAGPRA process and facilitate the resolution of disputes that may arise concerning repatriation under NAGPRA. All Federal agencies are subject to NAGPRA. All public and private museums that have received Federal funds, other than the Smithsonian Institution, are subject to NAGPRA.

3.8.1.3 Archaeological Resources Protection Act of 1979

The Archaeological Resources Protection Act (ARPA) applies when a project may involve archaeological resources located on Federal or tribal land. The Archaeological Resources Protection Act of 1979 (ARPA) established uniform definitions, standards, and procedures to be followed by all Federal land managers in providing protection for archaeological resources, located on public lands and Indian lands of the United States. These regulations enable Federal land managers to protect archaeological resources, taking into consideration provisions of the American Indian Religious Freedom Act (92 Stat. 469; 42 U.S.C. 1996), through permits authorizing excavation and/or removal of archaeological resources, through civil penalties for unauthorized excavation and/or removal, through provisions for the preservation of archaeological resource collections and data, and through provisions for ensuring confidentiality of information about archaeological resources when disclosure would threaten the archaeological resources. ARPA mandates that no person shall excavate archaeological sites on public lands without a permit from the relevant Federal agency (16 U.S.C. Section 470ee). Public lands are defined as lands held in fee by the United States (16 U.S.C. Section 470bb). If excavation of an archaeological site would be required to complete cultural resources management necessary for the YBI project, a permit would thus be required.

3.8.1.4 Section 4(f)

Historic properties may also be covered under Section 4(f) of the USDT Act, which regulates the “use” of land from historic properties. See Appendix B for specific information regarding Section 4(f).

3.8.1.5 California Environmental Quality Act

Historical resources are considered under the California Environmental Quality Act (CEQA), as well as California Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources (CRHR). PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet NRHP listing criteria. It further specifically requires Caltrans to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the SHPO before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the National Register or are registered or eligible for registration as California Historical Landmarks.

3.8.2 Affected Environment

A number of cultural resource studies were completed prior to preparation of this environmental document. These included an archaeological survey report (ASR) (Archaeological Survey Report, Yerba Buena Islands Ramps Improvement Project, September, 2009a), a Historic Resources Evaluation Report (HRER) (Historical

Resources Evaluation Report, Yerba Buena Island Ramps Improvement Project, San Francisco, California, May, 2009), and an HPSR (Historic Property Survey Report, Yerba Buena Islands Ramps Improvement Project. September, 2009b). A Finding of Effect (FOE) document was completed in October 2009. These combined reports document the known resources in the multiple areas of potential effects (APEs) that were established for the project and discuss the impacts associated with the undertaking.

Caltrans (under its authority delegated by FHWA in the 2004 PA and NEPA delegation in 2007), with assistance from other agencies, established that the YBI Ramps Improvement Project is an undertaking for the purposes of Section 106 of the NHPA and that the project has potential to cause effects to historic properties. FHWA, with assistance from Caltrans and other agencies, identified appropriate interested parties and Native American participants for input regarding resources in the project's APE.[13] This was followed by a program to identify historic properties in the APE. These efforts were documented in a Historic Property Survey Report (HPSR) that was accepted by Caltrans on October 22, 2009. The HPSR was submitted to SHPO in 2009, who concurred with the FOE (see Appendix J for a copy of the SHPO letter):

- All properties in the APE that were previously listed in or determined eligible for listing in the NRHP, either individually or as contributors to a historic district, remain eligible for listing in the NRHP under criteria established by 36 C.F.R. 60.4. A contributor is a building, structure, object, or site that may lack individual distinction and is, consequently, not individually eligible for the NRHP. Although such resources may lack individual distinction, if they add to the character of a historic district, they are considered to be contributors to that historic district, and are treated as historic properties.
- There are four historic properties within the Focused Area of Potential Effects (APE) for the built environment: Senior Officers' Quarters Historic District; Quarters 10/Building 267; Quarters 8; and a portion of the East Span of the SFOBB (Figures 3.8 1 through 3.8 3). One focused APE was for architectural resources and two were for archaeological resources (Alternatives 2b and 4). All focused APEs meet the definition of an APE set forth in 36 C.F.R. 800.16(d). While the East Span of the SFOBB will be replaced as part of a separate project, a general APE was established for the YBI Ramps project in order to show the full extent of the historic resource.
- Because the current project proposes the construction of new ramps that would connect to the new East Bay Span currently under construction, the proposed project has no potential to affect the existing SFOBB historic property. Therefore, no further study of the SFOBB as a historic resource is required for this project.)
- Archaeological site CA-SFR-04/H is individually eligible for inclusion in the NRHP under Criterion D as set forth in 36 C.F.R. 60.4.

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[13] An APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 C.F.R. Section 800.16(d)). The extent of the study area is dependent upon potential historic or archaeological resources in the general area. Under Caltrans policy, in accordance with guidance in Attachment 3 of the PA, different APEs can be established for different types of cultural resources. Two APEs were established for this undertaking. One encompasses archaeological resources and the other encompasses architectural/engineering resources that may be potentially affected by the YBI Ramps Improvement Project.

Source: Image: Nima/USGS 2004
Data: DMJM Harris, EDAW 8/2009

Figure 3.8-1
Architectural Area of Potential Effect

Area of Potential Effects

Source: Image: Nima/USGS 2004
Data: DMJM Harris, EDAW 8/2009

0 150 300 600 Feet

Figure 3.8-2
Alternative 2b
Archaeological Area of Potential Effects

Source: Image: Nima/USGS 2004
Data: DMJM Harris, EDAW 8/2009

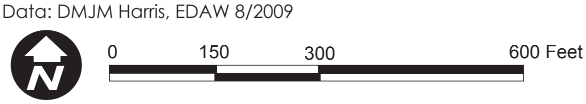


Figure 3.8-3
Alternative 4
Archaeological Area of Potential Effects

The Senior Officers' Historic District (including Quarters 1/Nimitz House), Quarters 10, and Quarters 8 was previously inventoried and evaluated for the U.S. Navy in 1997 as part of the U.S. Navy's Base Realignment and Closure program. The following year, Caltrans evaluated Quarters 10 (and Building 267) for the SFOBB ESSSP. In 2003, NRHP nominations and Historic American Building Survey (HABS) reports were prepared for the both the Senior Officers' Historic District and Quarters 10/Building 267.

The earliest evaluation of the SFOBB was completed in 1977 and resulted in SHPO's determination of eligibility for listing in the NRHP. The bridge was evaluated again in 1983 as part of the I-280 Transfer Concept Program, which was followed in 1999 by a 273-page Historic American Engineering Record (HAER) report.

An FOE was then prepared for agency review and was accepted by Caltrans in October 2009 (see Appendix J for the SHPO letter regarding the FOE received in February 2010). The FOE assesses the potential for this project to cause adverse effects on historic properties and initiates the process to resolve those adverse effects. Letters to interested parties were distributed on November 4, 2009 to describe the report findings as they pertain to cultural resources under the proposed project and alternatives.

Measures taken to mitigate adverse effects of the project are being addressed in the Memorandum of Agreement (MOA). The MOA is being developed in coordination with FHWA, the SHPO and the City and County of San Francisco.

Whereas the proposed project falls under the jurisdiction of FHWA, a Section 4(f) analysis of the project was conducted (see Appendix B).

3.8.2.1 Quarters 8

Quarters 8 is a symmetrical three-story, wood-frame, Mediterranean-style residence constructed in 1905. The building is significant under NRHP Criterion A within the context of military history, and under Criterion C, as an unusual example of Mediterranean-style architecture and as the work of the master architectural firm of the Reid Brothers.

3.8.2.2 Quarters 10/Building 267

Quarters 10/Building 267 was constructed in 1948 and is a mixture of three modern architectural styles: Moderne, International, and Bay Region. Building 267, a garage associated with Quarters 10, is similar in design and construction. The property is significant at the local level under Criterion C, as a significant example of mid-twentieth-century residential architecture.

3.8.2.3 Quarters 1/Nimitz House

Quarters 1/Nimitz House is one of eleven contributing elements to the Senior Officers' Quarters Historic District (described below). Quarters 1 is also listed in the National Register as an individual property and is significant under Criterion A, for its association with the development of West Coast military facilities, and under Criterion C, as an important example of Classical Revival architecture. Its period of significance is identified as 1898–1916.

Quarters 1/Nimitz House is also individually eligible under Criterion A for its association with the development of West Coast military facilities as well as an under Criterion C as an important example of Classical Revival architecture.

3.8.2.4 Senior Officers' Quarters Historic District

The Senior Officers' Quarters Historic District includes 11 contributing elements: seven residences (Quarters 1 through 7), two apartments/garages (Buildings 83 and 230), a five-car garage (Building 205), and the landscape that surrounds the district. The district is generally bounded by Northgate Road on the west and north, the greensward on the east, the SFOBB and hillside on the south, and the southern edge of the informal landscaping south of Building 230 and directly west of Quarters 1/Nimitz House. The majority of these wood-frame buildings were constructed around the turn of the twentieth century, with the exception of Buildings 83, 230, and 205, which were built in 1918, 1936, and 1944, respectively. The property is significant at the local level under Criterion A, for its association with the early development of military facilities on the west coast, and under Criterion C, as significant examples of Classical Revival/Colonial Revival residential architecture.

As described above, Quarters 1/Nimitz House is also individually eligible under Criterion A for its association with the development of West Coast military facilities as well as an under Criterion C as an important example of Classical Revival architecture.

3.8.2.5 San Francisco Oakland Bay Bridge

The SFOBB is significant at the national level under Criterion A, for its important influence on transportation in San Francisco Bay Area and the state as a whole. The bridge is also significant for its engineering design (Criterion C). The SFOBB consists of 15 contributing elements. The six contributing buildings include the Transbay Transit Terminal Building (San Francisco), Key System Electrical Substation (San Francisco), Key System Electrical Substation (YBI), SFOBB Firehouse (also known as the Caltrans Garage, YBI), Bay Bridge Substation (also known as the Caltrans substation, Oakland), and the Key Pier Substation (Oakland). The Firehouse and Key System Electrical Substation, which were once located within the Focused APE, have been demolished. The nine contributing structures consist of individual components of the bridge itself and include approaches, San Francisco approach on and off-ramps, street overcrossings (bus ramps in San Francisco), the main bridge spans (West and East Bay spans) and the YBI tunnel for the SFOBB ESSSP. Of these structures, only a short, westernmost section of the East Bay Span (Bridge No. 33-025) is located within the Focused APE. A new East Span of the SFOBB has been under construction since 2002 and construction activity continues within the Focused APE. The SFOBB within the project area will be replaced as part of a preceding project and thus would not exist to be affected by the project that is the subject of this study.

3.8.2.6 CA-SFR-4/H

One prehistoric archaeological site, CA-SFR-4/H, is located within the Yerba Buena Ramps Improvement Project APE. In 1997 the Caltrans Toll Bridge Program, in conjunction with the FHWA, began conducting cultural resource studies for their proposed SFOBB ESSSP. The project would replace the bridge's east span between YBI in San Francisco Bay and Oakland on the Bay's east shore. Prehistoric and historic-period archaeological site CA-SFR-4/H lay within the project APE on YBI. The site had been recorded previously as a buried prehistoric shell midden and an assemblage of historic-period structural remains associated with nineteenth- and early twentieth-century military use of the island. SHPO concurred with FHWA's determination that the prehistoric component of the site was eligible for the NRHP under Criterion D, for its potential to yield important data about Bay region prehistory. SHPO also concurred that the surface elements of the historic Naval Training Station component of CA-SFR-4/H did not contribute to the site's eligibility due to lack of integrity; however, there was a potential for buried, unevaluated American-period features or deposits associated with early settlers of the island and/or the U.S. Army post and depot.

Preconstruction assessments of the effects of the ESSSP on CA-SFR-4/H determined that about half the site area would be destroyed by project construction. Far Western Anthropological Group reported on the data recovery excavations in 2008 to address adverse effects from the bridge replacement project to the prehistoric component of CA-SFR-4/H and, secondarily, to provide for the compressed evaluation and treatment (consistent with Section 106 of the NHPA) of any historic-period features that might be uncovered during data recovery at the site.

The Research Design and Treatment Plan (Plan) developed for the archaeological investigations at CA-SFR-4/H by URS, was designed to mitigate effects to any components of the site determined to be eligible to the NRHP. All fieldwork under the Plan was conducted within the project's Area of Direct Impacts (ADI). Because human remains were likely to be present at the site, the Plan called for complete excavation of all midden deposits within the ADI, to ensure that any burials present would be recovered prior to construction.

An ARPA permit was required for archaeological excavation in the portion of the APE on Federal land. Phase III data recovery excavations were conducted in the fall of 2002, an additional auger program for boundary delineation was conducted at the site in January 2003, and a second phase of archaeological data recovery excavation was carried out in the summer of 2004, focusing on USCG lands.

Although the shell midden and overlying fill included an admixture of late nineteenth- and early-twentieth-century materials in some areas, no historic-era deposits or features were uncovered that could be attributed to specific occupations, individuals, or uses (e.g., Dowling, one of the first American-period settlers of the island; or U.S. Army post and depot occupation). The paucity of historic-era materials confirms that the historic component of CA-SFR-4/H is not a contributing element to the site's eligibility to the NRHP or the CRHR.

Native American representatives were contacted as part of the current archaeological analysis for the proposed project. The Native American Heritage Commission (NAHC) was solicited for a list of appropriate persons on November 7, 2008. The NAHC checked their database and provided the list of contacts on November 13, 2008, and letters and phone calls were conducted between December 17, 2008, and February 18, 2009. This correspondence is appended to the ASR (Archaeological Survey Report, Yerba Buena Islands Ramps Improvement Project. September, 2009a). Additionally, Native American representatives were contacted by the SFCTA regarding proposed protection measures and FOE on November 4, 2009 (Moscovich 2009).

If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

3.8.3 Environmental Consequences

3.8.3.1 Temporary Impacts

ALL ALTERNATIVES

It has been determined that there would not be any temporary impacts on cultural resources.

3.8.3.2 Permanent Impacts

The following section discusses the potential permanent impacts by alternative on cultural resources that may result from the Yerba Buena Ramps Improvement Project. These impacts include the primary construction activities as well as secondary effects such as impacts to historic buildings from vibration or work in proximity to historic properties that could affect their structural integrity.

Permanent impacts may result from the following activities:

- Preconstruction staging and storage of equipment;
- Utilities relocation;
- Geotechnical studies;
- Construction of haul roads;
- Excavation, grading, and stockpiling of soil;
- Construction of aerial structures and substructures, including vibration impacts during pile driving;
- Construction and demolition of temporary detours;
- Removal of vegetation and removal of existing buildings; and
- Temporary bracing and shoring, roadway construction, placement of reinforced concrete and precast concrete, landscaping, and demobilization.

NO BUILD ALTERNATIVE

The No Build Alternative would have no effect on historic buildings, structures, objects, sites, districts, or the cultural landscape because it represents the existing condition with no project-related activities.

ALTERNATIVE 2B

Alternative 2b would cause indirect and direct adverse effects to the Senior Officers' Quarters Historic District, as well as to individual historic properties (including Quarters 1/Nimitz House, Quarters 10/Building 267. Alternative 2b would cause a direct adverse effect to Quarters 10/Building 267 as a historic property, as the footprint of Alternative 2b occurs within the footprint of the buildings and requires that they be removed. This alternative would also cause a direct adverse effect to Senior Officers' Quarters Historic District as one of the proposed support columns would be constructed immediately southeast of Quarters 1/Nimitz House and would remove and/or damage a portion of the district's historic landscape, including grass and border hedge of the greensward in front of Quarters 1–3, and paved driveway and curbing southeast of Quarters 1/Nimitz House. Another proposed support column would be constructed within the formal terraced garden behind Quarters 1/Nimitz House and would destroy much of the third level of the terrace garden, which is a contributing element of the historic district.

Alternative 2b may also cause an indirect adverse effect on the historic district and Quarters 1/Nimitz House by introducing a potential risk of damage to the historic properties' significant features from construction vibration as well as by the introduction of visual or atmospheric elements that diminish the integrity of the properties' significant historic features. The construction of the ramps, which would rise between approximately 17 and 30.5 meters (55.8 and 100 feet) above the historic district, and its structural members that would be built immediately adjacent to contributing features, would alter the view of the historic property (see Figures 3.7-4 and 3.7-6).

Alternative 2b would have no adverse effect on the known archaeological site CA-SFR-4/H. Caltrans established ESAs as part of the SFOBB replacement project to protect the site during ground-disturbing activities. The currently proposed project was designed to avoid these ESAs where they pertain to archaeological materials.

ALTERNATIVE 4

Alternative 4 would cause indirect adverse effects to the Senior Officers' Quarters Historic District, as well as to individual historic properties (including Quarters 1/Nimitz House, Quarters 10/Building 267). Alternative 4 may cause an indirect adverse effect to the Senior Officers' Quarters Historic District, Quarters 1/Nimitz House, Quarters 10/Building 267 by potentially causing damage to the historic properties' significant features through construction vibration.

Alternative 4 would also cause an indirect adverse effect on the historic district by the introduction of visual elements that diminish the integrity of the property's significant historic features. The size and scale of the proposed structure is not consistent with the historic setting of Quarters 1/Nimitz House or the historic district and would constitute introduction of a new visual element. The ramp deck and support columns would obstruct the eastward view from Quarters 1/Nimitz House, and because the view from this building is a character-defining feature, Alternative 4 would diminish the integrity of Quarters 1/Nimitz House (see Figure 3.7-12 and 3.7-14). Thus, the introduction of the ramp structures would cause an adverse effect to both the district and Quarters 1/Nimitz House.

Alternative 4 would have no adverse effect on the known archaeological site CA-SFR-4H. Caltrans established ESAs as part of the SFOBB replacement project to protect the site during ground-disturbing activities. The currently proposed project was designed to avoid these ESAs where they pertain to archaeological materials.

4(F)

Both Alternative 2b and Alternative 4 would use Section 4(f) historic properties. Alternative 2b requires the permanent use of land from three resources: Senior Officers' Quarters Historic District, Quarters 1/Nimitz House, and Quarters 10/Building 267). Alternative 4 requires the use of two resources: Senior Officers' Quarters Historic District and the Quarters 1/Nimitz House. The Section 4(f) analysis for the project is located in Appendix B, "Section 4(f) Evaluation."

COMPARISON OF EFFECTS

The completed structures and alignment of Alternative 2b would more closely resemble the existing facility. Alternative 2b would adversely affect contributing features in geographically smaller areas than Alternative 4, thus having less impact on the integrity of the Senior Officers' Quarters Historic District. However, Alternative 2b would require the removal of Quarters 10/Building 267, which are individually listed in the NRHP. These buildings would be relocated to another location on YBI; however, this action would still be an adverse effect. Two locations are being considered for relocation of Quarters 10/Building 267; if Alternative 2b is approved, an appropriate level of environmental review would be conducted, in accordance with CEQA/NEPA requirements, prior to relocation of the structures.

Alternative 4 may cause an indirect adverse effect to the Senior Officers' Quarters Historic District, Quarters 1/Nimitz House, Quarters 10/Building 267 by potentially causing damage to the historic properties' significant features through construction vibration. Additionally, Alternative 4 would cause an indirect adverse effect on the historic district by the introduction of visual elements that diminish the integrity of the property's significant historic features.

Although Figure 2-1 for Alternative 2b and Figure 2-2 for Alternative 4 appear to show the project alternatives crossing over a portion of the ESA for CA-SFr-04/H, it is important to note that no columns supporting the elevated ramps are proposed within or in the immediate vicinity of the site boundaries. In summary, although considerable effort was made to retain historic structures, both alternatives could cause effects to the built-environment resources on YBI through construction vibration. However, Caltrans provides construction staff and requires contractors to follow specific guidance regarding on-site monitoring of vibrations caused by construction, which includes special provisions for historic structures and buildings. This monitoring procedure allows Caltrans (or the contractor) to respond to any potential damage caused by construction vibrations by modifying work methods or using different equipment, in order to avoid adverse effects (Hendricks 2002: 10-11). Alternative 2b would require that two historic buildings be permanently removed to accommodate construction, although they would be relocated to a location that is determined appropriate through consultation with the Office of Historic Preservation and stipulated in the MOA.

3.8.4 Avoidance, Minimization, and/or Mitigation Measures

The SFCTA and Caltrans are working closely with SHPO to ensure appropriate measures are developed and implemented under a Memorandum of Agreement (MOA). The Advisory Council on Historic Preservation (ACHP) was also notified of the adverse impact to cultural resources and has declined to participate (Johnson 2010). The MOA will describe the procedures that would be followed to ensure that the one known archaeological site (CA-SFR-04/H) is protected and how any inadvertent discoveries of archaeological sites will be addressed (see 3.8.4.1 below). Additionally, the MOA will describe how effects to buildings and the cultural landscape would be addressed (see 3.8.4.2 below). These are subject to revision following consultation among Caltrans, FHWA, SHPO, and SFCTA.

3.8.4.1 Archaeological Monitoring/ESA Action Plan

An Environmental Sensitive Area (ESA) Action plan will be developed and implemented to outline the avoidance and protection measures that will be taken to protect the known archaeological site (CA-SFR-04/H) and to address inadvertent discovery of unknown archaeological resources. A professional archaeologist who meets the Secretary of the Interior's Professional Qualification Standards (48 FR 44738-9) will work with Caltrans staff archaeologist in preparing the plan and ensuring the plan is implemented in the field. Testing and data recovery conducted during the SFOBB East Span project clearly defined the site boundaries of the prehistoric component of CA-SFr-04/H, which will continue to be marked as an Environmental Sensitive Area (ESA). In the unlikelihood that prehistoric and/or historic-era materials are encountered within the project area outside of the ESA during construction, it is Caltrans policy that all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner would notify the NAHC) who would then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains would contact the Caltrans staff archaeologist so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

3.8.4.2 Mitigation Proposed Under MOA

The MOA is being developed with input from SHPO. It would dictate a variety of tasks intended to avoid, minimize, or mitigate for impacts to the built environment. The MOA could include the following mitigation measures;

CONDUCT VIBRATION STUDIES

Prior to the commencement of any construction activity, measures to protect the buildings of the Senior Officers' Quarters Historic District, Quarters 1/Nimitz House, and Quarters 10/Building 267 from potential damage due to construction vibration will be developed and implemented. Existing analysis derived from the SFOBB ESSSP could be used to inform the need for changes in construction methodology, shoring, and/or building stabilization, if consultation among the SHPO, SFCTA, and Caltrans/FHWA requires it.

PREPARATION OF HISTORIC STRUCTURES REPORTS AND CONDITIONS ASSESSMENTS

Historic Structure Reports (HSRs) would be prepared for Quarters 1/Nimitz House and Quarters 10/ Building 267. Detailed information is needed to assess what avoidance and protection measures are required to prevent adverse effects. The HSRs would be written in accordance with the standards established in *Preservation Brief 43: The Preparation and Use of Historic Structure Reports*, by Deborah Slaton, published by Heritage Preservation Services, National Park Service, 2005. The HSRs would include a history of the property/building, construction history, archaeology, architectural evaluation, conditions assessment, maintenance requirements, recommendations for proposed work, copies of original drawings and specifications if available, current drawings if different from the original, and historic and current photographs. Such information would also help facilitate future owners or operators' adaptive reuse of these buildings and structures.

STABILIZATION/MONITORING/SECURITY DURING CONSTRUCTION

Before the construction phase of the project, a comprehensive stabilization/monitoring plan would be prepared, if consultation among the SHPO, SFCTA, and Caltrans/FHWA requires it. This plan could cover all potentially affected contributing elements, including historic structures and cultural landscape elements within the project area that are in proximity to construction activities. This plan would describe methods for the preservation, stabilization, shoring/underpinning, and monitoring of buildings, structures, and objects. The plan may also include provisions that high vibration construction techniques would be avoided in sensitive areas.

Underpinning and/or other stabilization and protective methods could be implemented at buildings located near project construction areas and that may be susceptible to damage or inadvertent destruction. A professional historical architect or architectural historian who meets the Secretary of the Interior's Professional Qualifications Standards (see 36 C.F.R. Regulations Part 61) would approve and monitor underpinning and stabilization activities. These same buildings would also require pre- and post-construction condition assessment reports

INTERPRETATION OF HISTORIC PROPERTIES

Public interpretive material would be developed commensurate with the significance themes for the resources affected by the project. Interpretive products may include signage, panels and other appropriate media for interpretation. The interpretation would outline the history and significance of the cultural resources. Interpretive signage would be coordinated with that already planned by Caltrans as mitigation for the SFOBB ESSSP.

RELOCATION

If Alternative 2b is selected, Quarters 10/Building 267 shall be relocated and reconstructed in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties: Standards for Preservation, Rehabilitation, Restoration, and Reconstruction* (1995). The process for moving these buildings would follow the approach outlined in *Moving Historic Buildings* (Curtis 1979). In addition, Quarters 10/Building 267 would be relocated by a professional mover with demonstrated experience in the successful movement of historic buildings. These efforts would be conducted in consultation with the Office of Historic Preservation.

Appropriate steps would also be taken to ensure that buildings would be protected prior to moving to accommodate construction. Quarters 10/Building 267 would be protected in place until they are relocated. Measures taken for Quarters 10/Building 267 would include securing the building and providing security before, during, and following its relocation for a period of time agreed to by Caltrans and the SFCTA. These provisions would follow recommended standards established in National Parks Service *Preservation Brief 31: Mothballing Historic Buildings* (Park 1993).

CULTURAL LANDSCAPE MONITORING AND PROTECTION MEASURES

Protection measures, such as ESA fencing, would be used to protect known resources during construction. These measures would be implemented for contributing elements of the Senior Officers' Quarters Historic District, including buildings and historic landscaping that are in proximity to the construction zone but are not anticipated to be impacted by demolition or construction activities related to the project. Protection measures outlined in mitigation stipulated by the MOA could include, but are not limited to, shoring and other stabilization methods, fencing, scaffolding and debris netting, and fire protection protocols such as no-smoking zones and other stabilization measures for structures as determined necessary to protect contributing resources or sensitive areas.

Monitoring of contributing elements of the Senior Officers' Quarters Historic District would be conducted in proximity to the project to support the protection measures for the built environment and the cultural landscape. Monitoring procedures would commence with preconstruction condition assessments of buildings and structures adjacent to the construction footprint to finalize monitoring requirements for built resources. If unexpected impacts to historic buildings or cultural landscape features are identified during construction, the provisions for protection, stabilization, or mitigation outlined in MOA would be followed in consultation with the U.S. Navy, SHPO.

This monitoring would be conducted by a professional architectural historian and/or a professional cultural landscape historian or landscape architect as appropriate, who meets the Secretary of the Interior's Professional Qualifications Standards.

REHABILITATION OF BUILDINGS AND REHABILITATION/RESTORATION OF CULTURAL LANDSCAPE FEATURES

The rehabilitation of Quarters 10/Building 267, and rehabilitation and/or restoration of cultural landscape features would be conducted in consultation with the Office of Historic Preservation and would follow the Secretary of the Interior's *Standards for the Treatment of Historic Properties: Standards for Preservation, Rehabilitation, Restoration, and Reconstruction* (1995) and National Parks Service *Preservation Brief 36: Protecting Cultural Landscapes: Planning, Treatment, and Management of Historic Landscapes* (Birnbaum 1994).

Only portions of the Senior Officers' Quarters Historic District landscape would be affected by the project. Therefore, only specific areas, or subareas, of the larger cultural landscape would be subject to treatment as part of the mitigation measures for the proposed project. Replanting would require coordination with natural resource restoration prescriptions and Caltrans landscape protocols.

MINOR REPAIRS AND RECONSTRUCTION

Inadvertent damage to historic properties, or to their contributing elements, would be repaired in accordance with the Secretary of the Interior's *Standards for Treatment of*

Historic Properties Standards for Preservation, Rehabilitation, Restoration, and Reconstruction (1995). This would include damage to contributing elements such as landscaping, curbs, fencing, and related features, as well as contributing buildings, structures, and objects.

CONDUCT POSTCONSTRUCTION CONDITION ASSESSMENT, AND A REEVALUATION OF RESOURCES

Following completion of construction of the YBI Ramps, a postconstruction conditions assessment and reevaluation would be conducted to determine whether NRHP- listed resources continued to adequately meet listing criteria. This reevaluation would apply to Quarters 10/Building 267 to assess whether the property still retains sufficient historical integrity to convey its significance. This reevaluation would take place subsequent to the Yerba Buena Ramps Improvement Project completion.

3.9 Hydrology and Floodplains

3.9.1 Regulatory Setting

EO 11988 (Floodplain Management) directs all Federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. FHWA requirements for compliance are outlined in 23 C.F.R. 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments,
- Risks of the action,
- Impacts on natural and beneficial floodplain values,
- Support of incompatible floodplain development, and
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project.

The base floodplain is defined as “the area subject to flooding by the flood or tide having a 1% chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

3.9.1.1 Federal Emergency Management Agency

Flood protection guidance is provided by the Federal Emergency Management Agency (FEMA) and is implemented at the state and local level through legislation and local flood protection ordinances. In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. FEMA administers the NFIP to provide subsidized flood insurance to communities that comply with FEMA regulations to limit development in floodplains. FEMA also issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. FEMA has established a minimum level of flood protection for new development as the 1-in-100 Annual Exceedance Probability (AEP) (i.e., 100-year flood event).

FEMA released a preliminary FIRM for the City and County of San Francisco on September 21, 2007. The map provides flood risk information that is used for flood insurance and floodplain management purposes under the NFIP. FEMA identified Special Flood Hazard Areas (SFHA) along the city’s shoreline and along San Francisco Bay, consisting of Zone A (as areas subject to inundation by tidal surge) and Zone V (areas of coastal flowing subject to wave hazards) at portions of waterfront piers, Mission Bay, Bayview Hunters Point, Hunters Point Shipyard, Candlestick Point, and Treasure Island (City and County of San Francisco, 2008c). YBI was identified as Zone X, which is an area of minimal flood hazard, and outside the 500-year flood level. The City submitted comments on the preliminary FIRM to FEMA.

In 2008, the San Francisco Board of Supervisors enacted a floodplain management ordinance (Floodplain Management Ordinance) to govern new construction and substantial improvements in flood zones of San Francisco, and authorized the City’s participation in the NFIP. Specifically, the Floodplain Management Ordinance includes a requirement that any new construction or substantial improvement of structures in a designated flood zone must meet the flood damage minimization requirements in the ordinance. The City Administrator has published floodplain maps for the city. The project site is not located within a designated flood zone on the city's floodplain maps (City and County of San Francisco, 2008d).

3.9.2 Affected Environment

3.9.2.1 Existing Hazards

YBI has not yet been mapped by FEMA. YBI has FEMA community identification number 060298 (Figure 3.9-1). However, as described above, the project site is not located within a designated flood zone on the city's floodplain maps. With its location in the San Francisco Bay, YBI may potentially experience various coastal hazards such as tsunamis, extreme high tides, or sea level rise. EO 11988 (Floodplain Management) requires that proposed Federally funded projects that could affect established floodplains be evaluated and impacts minimized. The current YBI ramps have not experienced flooding problems during historic severe storm events.

Figure 3.9-1
YBI FEMA Identification Map

The island's high point is located 103 meters (337.9 feet) above mean sea level, and large portions of the island are undeveloped, with steep wooded hillsides leading down to the shoreline. Within the project area, the area just north and south of I-80 on the far east of the project area has an 8% representative slope.[14] The area farther east has a lower representative slope of 1% and the area west along I-80 toward the YBI tunnel has a 40% representative slope. Finally, lands located farther to the north and south of I-80 in the west side of the project area have a representative slope of 53% (Natural Resources Conservation Service 2008).

[14] The slope gradient is recorded as three separate values: a low value, a high value, and a "representative" value. The representative value indicates the expected value.

EXTREME HIGH TIDES

In California, extreme high tides occur during summer and winter. The highest tide ever recorded in San Francisco Bay (between 1855 and 1983) occurred on December 3, 1983 (tide elevation of 1.83 meters [6 feet] National Geodetic Vertical Datum of 1929 [NGVD]). The estimated elevation of the 100-year tide in the proximity of the project site is approximately 1.83 to 2.04 meters (6 to 6.7 feet) above NGVD (BCDC 1988).

TSUNAMIS

Tsunamis are sea waves produced by an offshore earthquake, large landslide, or volcanic eruption. As a tsunami travels across the open ocean, it has a relatively low wave height but travels very quickly and increases dramatically in size and height upon entering shallow water. The wave can reach heights of 30 meters (98.4 feet) and cause extensive damage to coastal areas. San Francisco Bay is partially protected from the effects of tsunamis due to the restricted hydraulic access at the Golden Gate. The predicted wave run-up at the bay front in the proximity of the project site has been estimated to range between 2.4 and 2.5 meters (7.9 to 8.2 feet) NGVD for the 100-year tsunami (SFCTA 2008).

SEA LEVEL RISE

Measurements from around the world indicate that the sea level is rising relative to the land surface. It is a widely held belief that the increase in global warming will continue to contribute to the rising sea levels. Based on the most recent predictions from USEPA, the expected total sea level rise at the project site would be 16 centimeters (0.5 feet) by the year 2050 and 37 centimeters (1.2 feet) by the year 2100 (USEPA 1995). More recent data provided by the California Environmental Protection Agency (Cal/EPA) are consistent with the USEPA predictions (Cal/EPA 2009).

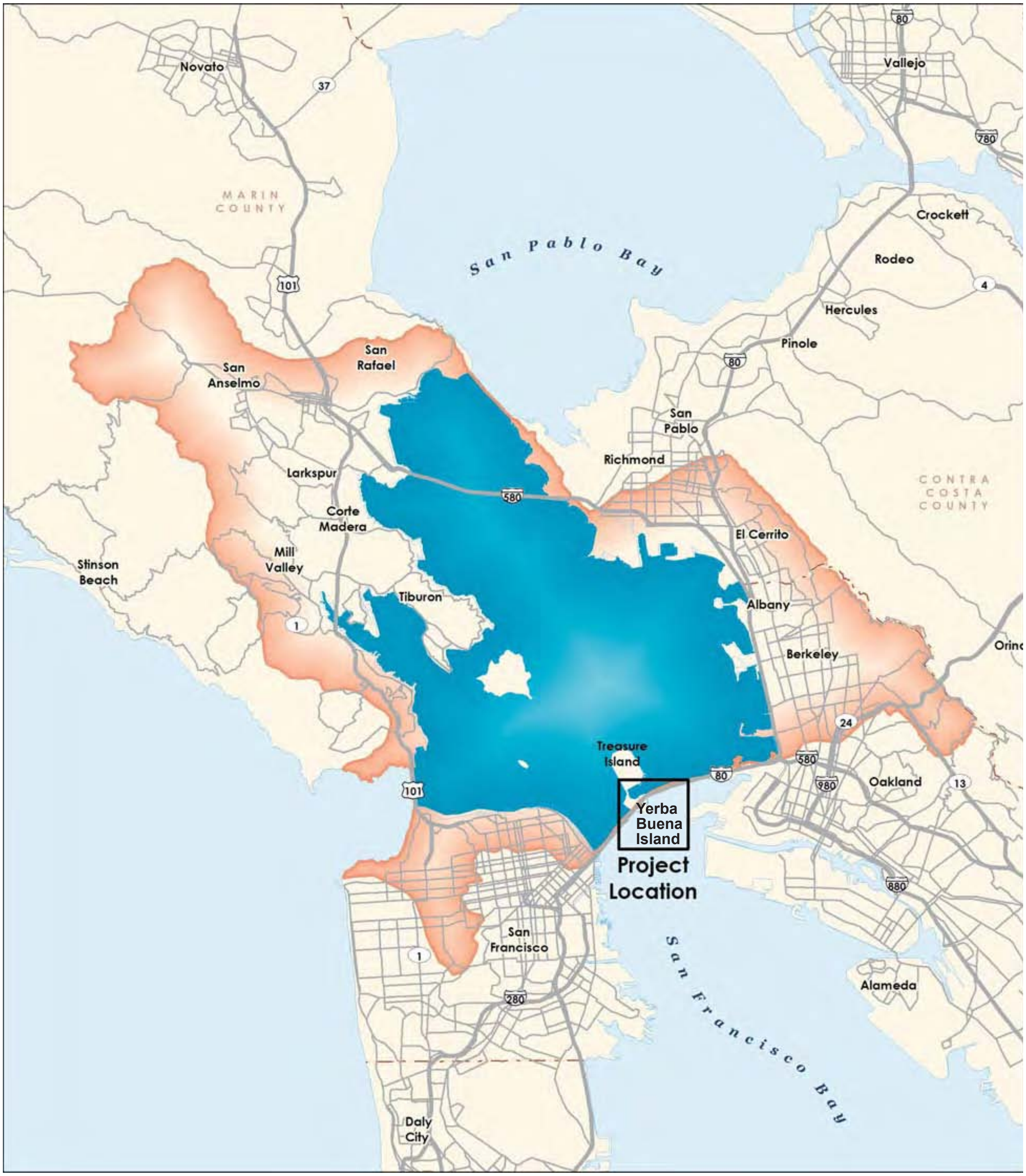
SURFACE WATER

The existing project site is located in a developed area surrounded by the San Francisco Bay. The proposed project is located in the San Francisco Bay watershed in the Bay Bridges Hydrologic Unit (Hydrologic Subarea 203.10) (Figure 3.9-2). The watershed area is approximately 21,461 hectares (53,031.3 acres) and the average rainfall in the area is 536 millimeters (1.8 feet).

In general, YBI's soil classification is dense to very dense silty sand with a slow to very slow rate of water infiltration (Water Quality Report for Yerba Buena Islands Ramps Improvement Project. August 21, 2009c). Unlike most of mainland San Francisco, TI and YBI are served by separate storm water and wastewater systems (SFPUC 2004). As a result, surface runoff from the project area flows untreated to the San Francisco Bay via the non-contiguous San Francisco Municipal Separate Storm Sewer System (MS4). The MS4 within the project area is not connected to San Francisco City's MS4 or combined sewer systems.

GROUNDWATER

YBI does not have an existing designated groundwater basin in the Basin Plan. The presence of subsurface water is dependent upon seasonal rain, upslope irrigation, or



Source: Department of Water Services 2004

Not To Scale

Figure 3.9-2
Hydrologic Unit

possible leaks in utility lines. In general, groundwater is not likely to be encountered during the dry season, but it may be encountered during the rainy season near the interface between the soil and rock (Long Form – Storm Water Data Report. Prepared for SFCTA and Caltrans. June,. 2009d). Boring logs did not indicate if the depth to groundwater was measured in any of the borings; however, four borings were classified as “wet,” which indicates that it was saturated, two borings were classified as “dry to damp,” and all other borings classified the material overlying the bedrock as “moist.”

Due to the absence of long-term monitoring of water levels, the natural groundwater depth is uncertain. Packer testing indicated that the bedrock was nearly impermeable below the weathered zone and therefore water introduced into the boreholes and in fractures of this material is not likely to drain away. This leaves the possibility that the measured water depths are not normal and the natural groundwater table should generally be expected near adjacent Bay levels.

3.9.3 Environmental Consequences

3.9.3.1 No Build Alternative

Under the No Build Alternative, the existing on- and off-ramps would remain and no new ramps would be built. The existing ramps are above an elevation of 2.7 meters (8.85 feet) and therefore it is not likely that the roadway could be inundated during a 100-year tsunami wave run-up event. There would be no increase in impervious surface and no increase in surface runoff because no new ramps would be built under this alternative. There would not be a significant encroachment as defined at in the Federal Code of Regulations (23 CFR 650.105).

3.9.3.2 Alternative 2b and Alternative 4

EXTREME HIGH TIDES, TSUNAMIS, OR SEA LEVEL RISE

As described above, the estimated elevation of the 100-year tide in the vicinity of the project site is 1.83 to 2.04 meters (6 to 6.7 feet) above NGVD. The surface elevation of the proposed ramps is above an elevation of 2.7 meters (8.85 feet) NGVD. Therefore the floodplain associated with the extreme adopted high tide level would not encroach into the project area (based on evaluation of existing topography and the elevation of the adopted 100-year high tide level).

“Significant encroachment” as defined at 23 CFR 650.105 is a highway encroachment and any direct support of likely base floodplain development that would: involve a significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community’s only evacuation route; a significant risk to life or property; or a significant adverse impact on natural and beneficial floodplain values. There is no action within the limits of the base floodplain and therefore no enchroachment. There would not be a significant encroachment as defined in the Federal Code of Regulations (23 CFR 650.105) (see Appendix G).

As described above, any roadways below 2.5 meters (8.2 feet) NGVD could be inundated during the 100-year tsunami wave run-up event. By the year 2050, the inundation elevation is expected to rise incrementally to 2.7 meters (8.85 feet) NGVD. Based on review of available topographic data, the surface elevations of the proposed ramps are above an elevation of 2.7 meters (8.85 feet) NGVD. In low-laying areas and dips along YBI, the roadway ramps are raised via pile foundations well above an elevation of 2.7 meters (8.85 feet) for both alternatives. Therefore, it is not likely that the roadway could be inundated during one of these unusual and extreme events.

The expected sea level rise at the project site would be 16 centimeters (0.5 feet) by year 2050 and 37 centimeters (1.2 feet) by the year 2100. While portions of YBI below the extreme high tide or tsunami wave run-up elevations may experience flooding if one of these events occurs, the proposed ramps would be above these elevations and not likely to be inundated or experience flooding if these events occur.

Relatively shallow groundwater conditions may be encountered in the project area, especially in the lower elevation areas of YBI where the westbound on- and off-ramps are proposed (2007). Please refer to Section 3.10.3 for a discussion of groundwater impacts.

HYDROLOGY

Alternative 2b would add 2.52 hectares (6.23 acres) of additional surface paving area compared with existing conditions. This additional impervious surface would increase surface runoff by 0.03 cubic meters per second (m^3/s) (1.06 cubic feet per second [ft^3/s]).

Alternative 4 would add 2.88 hectares (7.12 acres) of additional surface paving area compared with existing conditions. This additional impervious surface would increase surface runoff flows by 0.04 m^3/s (1.4 ft^3/s).

3.9.4 Avoidance, Minimization, and/or Mitigation Measures

3.9.4.1 Alternatives 2b and 4

Alternatives 2b and 4 both include independent ramp drainage systems to collect all ramp surface runoff. For all slopes, benching, rounding, and terracing would be considered to minimize concentrated flows. Side slopes would be rounded and shaped to reduce concentrated flows. Slope stabilization measures and retaining walls may be needed for these minimization techniques. In addition, slopes would include pipe or flume downdrains to collect concentrated flows, minimize erosion, and direct storm water into the proposed drainage system and for further treatment via a bioswale system prior to release into San Francisco Bay. Additional discussion of stormwater collection and treatment options is provided below in Section 3.10.3.2, Permanent Impacts.

FLOODING MINIMIZATION

As the ramps under either build alternative would be constructed above an elevation of 2.7 meters (8.85 feet) NGVD, the project would not increase flood risk to YBI. However, for both alternatives, the proposed drainage system and bioswale would be designed to convey flood flows, and the project engineers would coordinate with the San Francisco Bay Regional Water Quality Control Board to ensure that the design capacity of the constructed storm drain system is adequate (Long Form – Storm Water Data Report. Prepared for SFCTA and Caltrans. June, 2009d).

HYDROLOGIC MINIMIZATION

For both alternatives, bioswales would be designed to capture the increased flow rate due to the additional impervious surface. For Alternative 2b, the bioswale would be designed to capture and treat 0.03 m^3/s (1.06 ft^3/s) of runoff and for Alternative 4, the bioswale would be designed to capture and treat 0.04 m^3/s (1.4 ft^3/s) of runoff.

By incorporating the minimization measures, no hydrologic impacts would occur.

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3.10 Water Quality and Storm Water Runoff

3.10.1 Regulatory Setting

Federal and state programs regulate and monitor water quality, floodplains, and other water-related resources. This section summarizes these laws, regulations and policies. Regulatory issues related to compliance with the Coastal Zone Management Act (Bay Plan), Section 401 and Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 are addressed in Section 3.17, Biological Environment.

Section 401 of the Clean Water Act (CWA) requires water quality certification from the State Water Resources Control Board (SWRCB) or from a Regional Water Quality Control Board (RWQCB) when the project requires a CWA Section 404 permit. Section 404 of the CWA requires a permit from the U.S. Army Corps of Engineers (USACE) to discharge dredged or fill material into waters of the United States.

Along with CWA Section 401, CWA Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) permit for the discharge of any pollutant into waters of the United States. The USEPA has delegated administration of the NPDES program to the SWRCB and nine RWQCBs. The SWRCB and RWQCB also regulate other waste discharges to Waters of the State through the issuance of waste discharge requirements under authority of the Porter-Cologne Water Quality Act.

The SWRCB has developed and issued a statewide NPDES permit to regulate storm water discharges from all Caltrans activities on its highways and facilities. Caltrans construction projects are regulated under the statewide permit, and projects performed by other entities on Caltrans right-of-way (encroachments) are regulated by the SWRCB’s Statewide General Construction Permit. All construction projects more than 0.4 hectare (1 acre) are regulated under the construction storm water general permit and require a Storm Water Pollution Prevention Plan (SWPPP) to be prepared and implemented during construction. Caltrans activities less than 0.4 hectare (1 acre) require a Water Pollution Control Program.

The San Francisco Public Utilities Commission (SFPUC) is charged with managing San Francisco’s drainage system and is actively pursuing ways to improve its wastewater treatment to enhance environmental quality and reduce pollutants to the Bay. Therefore, the SFPUC is pursuing a policy to require that new and redevelopment projects in San Francisco take advantage of best management practices (BMPs) and Low Impact Development (LID) technologies for managing storm water runoff. LID directs runoff to natural vegetated systems, such as landscaped strips and swales that reduce, filter or slow storm water runoff, to help mitigate the impacts of impervious surfaces.

Section 401 of the Clean Water Act requires water quality certification from the SWRCB or an RWQCB when the project requires a Federal permit. Typically this means a Clean Water Act Section 404 permit to discharge dredge or fill into a water of the United States, or a permit from the Coast Guard to construct a bridge or causeway over a navigable water of the United States under the Rivers and Harbors Act.

Along with Clean Water Act Section 401, Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) for the discharge of any pollutant into waters of the United States. The Federal Environmental Protection Agency has delegated administration of the NPDES program to the SWRCB and the nine RWQCBs. To ensure compliance with Section 402, the SWRCB has developed and issued Caltrans an NPDES Statewide Storm Water Permit to regulate storm water and non-storm water discharges from Caltrans' right-of-way, properties and facilities. This same permit also allows storm water and non-storm water discharges into waters of the State pursuant to the Porter-Cologne Water Quality Act.

Storm water discharges from Caltrans' construction activities disturbing one acre or more of soil are permitted under Caltrans' Statewide Storm Water NPDES permit. These discharges must also comply with the substantive provisions of the SWRCB's Statewide General Construction Permit. Non-Caltrans construction projects (encroachments) are permitted and regulated by the SWRCB's Statewide General Construction Permit. All construction projects exceeding 0.4 hectare (1 acre) or more of disturbed soil require a Storm Water Pollution Prevention Plan (SWPPP) to be prepared and implemented during construction. The SWPPP, which identifies construction activities that may cause discharges of pollutants or waste into waters of the United States or waters of the State, as well as measures to control these pollutants, is prepared by the construction contractor and is subject to Caltrans review and approval.

Finally, the SWRCB and the RWQCBs have jurisdiction to enforce the Porter-Cologne Act to protect groundwater quality. Groundwater is not regulated by Federal law but is regulated under the state's Porter-Cologne Act. This project, which may involve construction site dewatering activities that may pose a threat to groundwater quality, are also regulated by the San Francisco Bay RWQCB (SFBRWQCB).

3.10.2 Affected Environment

3.10.2.1 Surface Water

A Water Quality Report was completed in August 2009 and is incorporated into this document (Appendix K). The project site is located in a developed area surrounded by the San Francisco Bay. The proposed project is located in the San Francisco Bay watershed in the Bay Bridges Hydrologic Unit (Hydrologic Subarea 203.10). The watershed area is approximately 21,461 hectares (53,031 acres) and the average rainfall in the area is 536 millimeters (21 inches).

In general, YBI's soil classification is dense to very dense silty sand with a slow to very slow rate of water infiltration (Long Form – Storm Water Data Report. Prepared for SFCTA and Caltrans. June, 2009d). Unlike most of mainland San Francisco, TI and YBI are served by separate storm water and wastewater systems (SFPUC 2004). As a result, surface runoff from the project area flows untreated to the San Francisco Bay via the San Francisco MS4. The MS4 within the project area is not connected to San Francisco city's MS4 or combined sewer systems.

The Region 2 Basin Plan (SFBRWQCB 2007) establishes beneficial uses for waterways and water bodies within the Central Basin in San Francisco County. The existing beneficial uses for the Central San Francisco Bay area include industrial service water supply; industrial process supply; ocean, commercial, and sport fishing; shellfish harvesting; estuarine habitat; fish migration; preservation of rare and endangered species; fish spawning; wildlife habitat; water contact recreation (e.g., swimming, windsurfing, fishing); noncontact water recreation (e.g., boating, picnicking, sunbathing); and navigation.

Central San Francisco Bay is the nearest receiving water body for this project. Central San Francisco Bay is listed as impaired on the CWA Section 303(d)[15] list for chlordane, DDT, dieldrin, mercury, polychlorinated biphenyls (PCBs), PCBs (dioxin-like), selenium, dioxin compounds, furan compounds, and exotic species. Total maximum daily loads (TMDLs) are a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards. TMDLs for the San Francisco Bay have been established based on the 2006 303(d) list. TMDLs have only been established at this time for mercury and PCBs; all of the other pollutants listed in the 2006 303(d) list have not been completed. The SFBRWQCB has also recommended the Central San Francisco Bay shoreline for placement on the 303(d) list for trash impairment (SFBRWQCB 2008). Roadway runoff generally consists of the following contaminants: hydrocarbons (oil and grease, diesel), metals, micro-biological, nutrients, pesticides and herbicides, and semi-volitile organics (Caltrans 2003). These 303(d) listed contaminants are atypical of roadway runoff, as evidenced by roadway characterization studies previously performed by Caltrans (Caltrans 2003).

3.10.2.2 Groundwater

YBI does not have an existing designated groundwater basin in the SFBRWQCB Basin Plan and therefore, the project site does not have existing or proposed beneficial uses of groundwater. Due to the absence of long-term monitoring of water levels, the natural groundwater depth is uncertain. However, relatively shallow groundwater conditions may be encountered in the project area, especially in the lower elevation areas of YBI (AGS 2007).Based on current and previous environmental investigations, several areas of known and potential contaminant sources have been identified on YBI (Water Quality Report for Yerba Buena Islands Ramps Improvement Project. August 21, 2009c). At the high portion of northeastern YBI, elevated levels of beryllium, lead, and pesticides have been detected. Along the entire shadow area of the existing bridge and adjacent ramps, investigations indicate a potential for lead contamination in surficial soils. Petroleum hydrocarbons were also found at a former gas station and adjacent fire station, both of which have been demolished. Petroleum hydrocarbons have also been found at an active underground storage tank (leaking underground storage tank or LUST). In addition, it has been established that there is petroleum hydrocarbon contamination in the groundwater. There is also probable aerially deposited lead (ADL) contamination, primarily from tailpipe emissions, in the unpaved areas adjacent to the existing roadway. Please refer to Section 3.13, Hazardous Waste/Materials, for additional discussion of existing groundwater contamination and Section 3.13.8 for mitigation measures.

[15] Under Section 303(d) of the Clean Water Act, states, territories and authorized tribes are required to develop a list of water quality limited segments. These waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology.

3.10.3 Environmental Consequences

3.10.3.1 Temporary Impacts

NO BUILD ALTERNATIVE

Under the No Build Alternative, the existing on- and off-ramps would remain and no new ramps would be built. No construction activities would occur under this alternative. Therefore no construction storm water runoff would occur.

ALTERNATIVE 2B AND ALTERNATIVE 4

Alternative 2b would have a total disturbed soil area (DSA) of approximately 0.93 hectares (2.3 acres). Alternative 4 would have a total DSA of 1.77 hectares (4.4 acres). The DSA is the area from the edge of the pavement to the construction limits created by the cut and fill slopes and includes contractor staging areas. This area does not include the paved ramp area.

Alternatives 2b and 4 would have similar potential short-term impacts to water quality during construction activities due to soil disturbance. These potential short-term impacts are discussed in detail below.

CONSTRUCTION DEWATERING

The construction of either build alternative would require excavation below the ground surface for bridge foundations and pile caps. Typical construction practices require pumping of groundwater to dewater excavations below the groundwater level.

Existing groundwater quality data indicate that the groundwater may be contaminated and requires pretreatment prior to discharging. Additionally, permits for discharging to sewers or surface waters would require characterization of the chemical quality of the effluent to identify treatment requirements prior to discharge. The Caltrans General Permit allows the discharge of noncontaminated construction dewatering in conformance with Stormwater Management Plan (SWMP) procedures. The SFBRWQCB at its discretion may require a separate dewatering permit for this project (R2-2007-0033).

The proposed project would characterize the quality of groundwater in the vicinity of the dewatering operations (prior to initiation of dewatering). The dewatering would take place in conformance with the Caltrans General Permit and SWMP. Any discharge of groundwater to the sanitary sewer system would be required to comply with the SFPUC pretreatment standards.

If contaminants are present in dewatering effluent at levels that could cause environmental harm, measures would be implemented to either treat the effluent prior to discharge in conformance with the applicable permit, or collect the dewatering effluent for offsite disposal to an appropriate licensed waste disposal facility.

Discharge to the storm sewer system (and eventually to the Bay) or directly to the Bay would be addressed by the Caltrans General Permit, which incorporates performance requirements and other technical provisions and would be subject to the quantitative water quality objectives included in the SFRWQCB Basin Plan. In exceptional cases, the

SFRWQCB may require a separate NPDES permit for the dewatering discharge; However, a separate, project-specific, dewatering permit would be highly unlikely.

As previously noted, some form of pretreatment to remove pollutants in the effluent down to acceptable thresholds for discharge may be required prior to discharge. If the dewatering effluent does not meet the requirements for sewer discharge, provisions for other off-site treatment/disposal would be made. Implementation of the Caltrans General Permit and SWMP would minimize the potential impact of disposal of contaminated groundwater into the combined sewer system and the local storm drain system.

CONSTRUCTION STORM WATER RUNOFF

The build alternatives would involve roadway construction, including excavation, grading, stockpiling of soil, and reconstruction of existing facilities involving removal and replacement of earthen materials. Runoff generated during rainfall events may result in erosion of exposed soil and stockpiled soil. Sediment transported by runoff may cause sedimentation in downstream drainages. The accumulation of sediment may result in blockage of flows, potentially resulting in localized ponding or flooding and impacts to habitat.

Under existing conditions, the majority of runoff generated from the project site flows into San Francisco Bay via the storm sewer system. During construction, sediment may be transported by the runoff and discharged into the Bay, resulting in water quality degradation. Other potential pollutants of concern include vehicle fluids, oil, trash, and debris. Without appropriate BMPs in place during construction, sediment may be transported by the runoff and discharged into the Bay, resulting in water quality degradation. Other potential pollutants of concern include vehicle fluids, oil, trash, and debris. The Caltrans General Permit requires control BMPs for control of construction site runoff. The SWPPP would require approval by the SFBRWQCB, would identify potential pollutant sources that could affect the quality of runoff, and would require identification, construction, and implementation of construction site BMPs. BMPs are designed to reduce pollutants in storm water discharges from the construction site.

Construction site BMPs include but are not limited to soil stabilization (e.g., hydraulic mulch, erosion control blankets/mats, and ESA fencing), sediment control (e.g., silt fence, fiber rolls, inlet protection), tracking control (e.g., stabilized construction entrances/exits, tire/wheel washes), and waste materials control.

The SWPPP would specify a monitoring program and would require that the supervisors and workers be knowledgeable about each portion of the site and maintain awareness of the importance of storm water quality protection and pollution prevention. Compliance with existing regulations, programs, and the SWPPP would adequately address potential construction-related storm water runoff impacts.

3.10.3.2 Permanent Impacts

This section describes potential permanent impacts that would occur during project operations and maintenance. The operation of a roadway results in the discharge of contaminants to the environment that can be transported by runoff away from the roadway and its ramps. Pollutants associated with roadways include metals and petroleum hydrocarbons contained in fuels and lubricants, and pollutants associated with wear of tires and brake pads (e.g., particulate matter and metals).

NO BUILD ALTERNATIVE

Under existing conditions, the total amount of impervious roadway area (within the project study area) is approximately 1.47 hectares (3.6 acres). This area would not change under the No Build Alternative. No changes to the existing ramp drainage system and no additional treatment would occur under this alternative. Surface runoff would continue to be collected in gutters and inlets along the roadway and no bioswales would be designed. There are no impacts associated with the No Build Alternative.

ALTERNATIVE 2B AND ALTERNATIVE 4

Currently, surface runoff from the westbound lanes of I-80 is collected in deck drains on the side of the SFOBB. Both Alternatives 2b and 4 include an independent ramp drainage system to collect all ramp surface runoff. Slopes would include pipe or flume downdrains to collect concentrated flows and minimize erosion.

The proposed project traffic is not expected to increase substantially when compared with existing conditions. Following water quality treatment, the runoff would not be expected to contain detectable amounts of any of the pollutants of concern listed in the 303(d) for the Central San Francisco Bay. In this instance, storm water treatment target pollutants related to traffic are not entirely covered in the 303(d) list.The Caltrans statewide permit and SWMP call for the consideration of permanent BMPs, including treatment BMPs to control runoff after project construction. Preliminary treatment options for the proposed ramps were narrowed down to bioswales (Long Form – Storm Water Data Report. Prepared for SFCTA and Caltrans. June, 2009d). Bioswales would be designed in close consultation with the Regional/District NPDES coordinators due to the site's hazardous soil conditions and would likely require the use of impermeable liners and an underdrain.

Bioswales would collect flows from the proposed roadways and treat the runoff prior to discharge. For both Alternatives 2b and 4, the bioswale would be located north of the proposed westbound ramps and south of North Gate Road. Flows would then be discharged into the San Francisco Bay via the existing and upgraded storm drain system. In accordance with and as described in the SWDR, the bioswale would be designed, constructed, and maintained to treat storm water runoff associated with this project and within the roadway right-of-way (Long Form – Storm Water Data Report. Prepared for SFCTA and Caltrans. June, 2009d). Frequent small storms, which over the long term carry the substantial quantity of total pollutant load, would be the focus of the bioswale. The bioswale would also include bypass features that allow the safe passage of larger (i.e., 25-year storm) untreated storm flows.

Additionally, 401 Certification and a 404 permit would be required for the project, which would require coordination with and approval from SFBRWQCB and the U.S. Army Corps of Engineers.

3.10.4 Avoidance, Minimization, and/or Mitigation Measures

No adverse impacts to water quality and storm water runoff would occur with the project. Caltrans would continue to incorporate minimization measures where feasible during the design process.

In compliance with EO 13112 and subsequent guidance from FHWA, the landscaping and erosion control measures included in the project would not use species listed as noxious or invasive weeds by the California Department of Food and Agriculture list. Disturbed areas would be reseeded after construction activities are complete.

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3.11 Geology/Soils/Seismic/Topography

3.11.1 Regulatory Setting

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) was passed in December 1972 to mitigate the hazard of surface faulting to structures for human occupancy. Surface rupture is the most easily avoided seismic hazard. The Alquist-Priolo Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Alquist-Priolo Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards.

In 1990, following the Loma Prieta earthquake, the California Legislature enacted the Seismic Hazards Mapping Act to protect the public from the effects of strong ground shaking, liquefaction, landslides, and other seismic hazards. The act established a statewide mapping program to identify areas subject to violent shaking and ground failure. The program is intended to assist cities and counties in protecting public health and safety.

For geologic and topographic features, the key Federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under CEQA.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Caltrans' Office of Earthquake Engineering is responsible for assessing the seismic hazard for Caltrans projects. The current policy is to use the anticipated maximum credible earthquake (MCE), from young faults in and near California. The MCE is defined as the largest earthquake that can be expected to occur on a fault over a particular period of time.

3.11.2 Affected Environment

3.11.2.1 Regional Geologic Setting

A site-specific geotechnical memorandum has been prepared for the YBI Ramps Improvement Project:

- Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California (2010). [Appendix Q]

Additional geotechnical information has been provided for the entire project area in the following reports:

- Draft Preliminary Foundation Report – Yerba Buena Island Interchange Ramp Project, San Francisco Bay Bridge, California, April (2007).

- San Francisco-Oakland Bay Bridge East Span Seismic Safety Project Final EIR. May 8 (2001).

- Geotechnical and Geological Evaluation – Yerba Buena Island Viaduct Vulnerability Study, San Francisco, CA. November 10 (2006).

- Transfer and Reuse of Naval Station Treasure Island, Final Environmental Impact Report. June 1 (2006).

- Treasure Island Seismic Vulnerability Report (Preliminary). February 15 (2006).

- Final Report – Geotechnical Investigation – Treasure Island Causeway Seismic Stabilization Study, San Francisco, CA. November 10 (2006).

The project site is located in the Coast Ranges geologic/geomorphic province of central and northern California. The Coast Ranges have a general northwest orientation and are characterized by north–northwest-trending folds and faults. The Coast Ranges province extends from approximately 483 kilometers (300 miles) south and 402 kilometers (249.8 miles) north of the project site. The Coast Ranges province is bordered to the north by the Klamath Mountains, to the south by the Transverse Ranges province, to the west by the Pacific Ocean, and to the east by the Great Valley province.

The San Francisco Bay region is located within a northwesterly oriented geomorphic depression called the San Francisco Bay-Santa Clara Valley depression. This depression and its surrounding mountains all have relatively recent tectonic origin. Most of the San Francisco Peninsula is underlain by bedrock of mid-Cretaceous to Jurassic age, mainly sandstone, shale, chert, greenstone, and sheared rock. The sea level has fluctuated significantly several times prior to and during Holocene times, and sediments known as Bay mud have been and are currently being deposited under estuarine conditions. The Bay mud consists of unconsolidated to moderately consolidated, saturated, organic-rich silty marine clays.

3.11.2.2 Regional Seismic Setting and Seismicity

The San Francisco Bay Area is one of the more seismically active regions of California. There are at least seven active faults (San Andreas, Hayward, Rodgers Creek, Calaveras, Green Valley, Concord, and Franklin) within 50 kilometers (31.1 miles) of the project site (USDT-FHWA 2001). The active faults trend northwesterly and display a similar right-lateral, primarily horizontal movement (displacement is sideways along fault plane instead of up/down vertical displacement). These faults have generated large historical earthquakes resulting in major surface disturbances, and segments of these faults have been designated as Special Earthquake Fault Zones by the California Division of Mines and Geology (Earthquake Fault Zoning Act). Numerous other smaller active faults are present throughout the region but are farther from the project site and not believed to be capable of causing significant earthquake shaking within the project area.

The project area's main geologic structures are associated with two major faults: the San Andreas fault about 14.5 kilometers (9 miles) to the west and the Hayward fault, which is located about 8 kilometers (5 miles) to the east. Both faults have had large historic earthquakes, including the 7.8 magnitude[16] (Richter Scale) earthquake on April 18, 1906,

[16] Although the 1906 earthquake has been given an 8+ magnitude by some, the best estimate and also the current consensus among seismologists is 7.8.

and the 7.1 magnitude (Richter Scale) Loma Prieta earthquake on October 17, 1989. These earthquakes caused widespread damage throughout the greater San Francisco Bay Area. The Hayward fault has long been documented as active, with a major earthquake in 1868. An MCE is the largest earthquake reasonably capable of occurring under the current tectonic setting. The MCE has been estimated for the San Andreas fault at 8 and 7.25 on the Hayward fault (USDT-FHWA 2001).

3.11.2.3 Geology and Geotechnical Conditions in the Project Area

SOILS AND TOPOGRAPHY

The majority of the island is covered with unlithified alluvial deposits, along with localized areas of artificial fill. The unlithified material is primarily wind-blown sand and weathered decomposed Franciscan Formation.

Soils on YBI range from fine sandy loam to gravely loam 25.4 to 101.6 centimeters (10 to 40 inches) deep (City and County of San Francisco 2006). The natural soils consist of a complex of Candlestick, Kron, and Buriburi soils. These are generally coarse, loose soils, which reflect the underlying Franciscan sandstone bedrock. The permeability of these soils is moderately low. Storm water runoff is rapid, and soil erosion potential is high. Candlestick soil is a sandy loam that is very susceptible to failure on steep slopes. The Kron soil, also a sandy loam, is the shallowest of the three subunits, with a depth of 25.4 to 50.8 centimeters (10 to 20 inches) to bedrock. The Buriburi subunit is a gravelly loam, with a depth of 50.8 to 101.6 centimeters (20 to 40 inches) to bedrock.

The project site is characterized by four basic units (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California , 2010):

- Artificial Fill (af)
- Sedimentary Deposits and Alluvium (Qs, Qal, Qb, Qc, Dbr)
- Landslide Deposits (Qls and Qols)
- Bedrock of the Franciscan Formation (JKf)

The Franciscan Formation on YBI and the immediate surrounding area is unusually coherent compared to the formation in other parts of California which is composed of a highly deformed melange of ancient seafloor/trench deposits. The rocks are about 140 million years old and have undergone a long history of deformation beginning with uplift from the deep ocean basin to its present surface exposure. This history included subduction zone tectonics, perhaps several episodes of uplift, folding, and subsidence, and plate-boundary faulting.

There are abundant shear zones with minor displacements on the order of millimeters and centimeters within the Franciscan Formation bedrock. Several larger fracture zones and minor shear zones were encountered in boreholes and foundation excavations within the rocks of Northeast Point. However, there are no known active faults in proximity of Yerba Buena Island and no historic earthquakes associated with fault rupturing on the island. Geophysical investigations north of the island revealed that offshore discontinuities are a result of dredging and filling activities and not faulting. An onshore geophysical study suggested another zone of poor continuity within the Saddle

Area, but detailed analysis of aerial photographs, geophysics, core samples, and down-hole video logs do not favor a fault origin (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010).

Bedding within the bedrock of the island generally strikes about N50° to 60°W and dips about 20° to 70° to the northeast. In general, the dips are steepest in the central part of the island and decrease gradually toward Northeast Point where dips of 30° to 45° degrees are most common. Just offshore to the east of the point, bedding dips in the 20° to 45° range.

The rocks of the formation are highly fractured with fracture density generally in the 3 to 4 fractures per foot range, especially near the surface. The density of fracturing generally decreases with depth where most joints are healed with calcite cement. The rocks have abundant intersecting calcite and some quartz veins which represent healed fractures. There are abundant minor intensely fractured zones. Some of these fractures have slickensides and fresh appearing oxidation indicating slight reopening and water percolation at some later time. The orientation of the fractures is distributed throughout all quadrants of the compass without any dominant orientation (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010).

Tiny shears, generally hairline, and minor shear zones are ubiquitous throughout the rocks. These small shears are largely intra-formational and commonly intra-stratal features that formed when the rocks were still soft sediment or only slightly lithified. Displacements on such features are generally small fractions of an inch (on the order of millimeters or centimeters). These features are completely healed and may be tens of millions of year old and of no significance to the modern tectonic regime.

A total of seven soil samples were tested for pH, minimum resistivity, soluble chloride content, and soluble sulfate content (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010). Based on the combined test results and these Caltrans criteria, the on-site soils are not considered to be corrosive to bare metals and concrete in contact with the on-site soils at the proposed foundations locations. However, the subject site is located within in a marine environment defined in the Caltrans Corrosion Guidelines as a site located within 304.8 meters (1,000 feet) of brackish water.

YBI can be divided into four distinct topographic zones (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010):

- the Main Island;
- Northeast Point, which forms the small knoll at the northeast tip of the island;
- the Saddle Area, which forms the lowest part of the natural island between the Main Island and Northeast Point; and
- Treasure Island, the low-elevation man-made island on the north.

The project area is on the northeast flank of the Main Island. The change in topography of the island is extreme, with steep slopes over short distances. The elevations range from 103 meters (337.9 feet) near the center of the island to sea level, and slopes range from 5% to 75%. The USCG land along the southeast shore occupies the flattest area of the island and has been enlarged through the placement of fill material.

YBI is a peak in the Franciscan Formation bedrock surface that underlies the San Francisco Bay. It provides anchor points for the east and west spans of the Bay Bridge. To the east of YBI is a deep erosional trough developed in the Franciscan bedrock surface that extends beneath Alameda Island and the Oakland Airport (City and County of San Francisco 2006). As a result, the top of the bedrock goes from an elevation of about 103 meters (337.9 feet) NGVD on YBI to about -304.8 meters (-1,000 feet) NGVD beneath Oakland Airport.

Areas of artificial fill surrounding YBI, such as TI and part of the USCG station, were created by placing dredged Bay deposits and cut materials from YBI in relatively shallow water areas to create emergent usable pads.

GROUNDWATER

No groundwater was encountered during the subsurface exploration as part of the EMI study. Groundwater was also not found in the existing monitoring well 08-1 at the time of the investigation (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010).

Groundwater was reported in previous studies done in October and November of 1999. Boreholes 99-220 and 99-221 were reported to have groundwater encountered at approximate El. +14 m and El. +10 m, respectively and interpreted the natural groundwater table to be near sea level (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010). However, significantly higher levels have been measured in the sediment cover in the central part of the island, resulting from infiltration of surface run-off from seasonal rains on the higher elevations on YBI. Depth to groundwater, based on previous subsurface investigations conducted under the Installation Restoration program, varies from 2.1 to 18.5 meters (6 to 55 feet). Based on subsurface topography, groundwater flow tends to the northeast and southeast, toward San Francisco Bay.

Groundwater fluctuates due to seasonal influences, in particular from infiltration of surface water run-off and seepage from higher elevations on YBI, and to a lesser degree due to human-made influences. Groundwater levels are likely to continue to fluctuate with the change of season and may receive surface waters from the rock hill located to the west and above the project site.

SLOPE STABILITY

The existing slopes above Macalla Road have gradients varying in ratio from vertical to horizontal (V:H) from 2V:1H to 4V:1H. The slope gradients below Macalla Road are in a vertical to horizontal ratio of 1.5V:1H to 2V:1H range (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010).

According to geotechnical data collected during analysis of the SFOBB ESSSP, several slope stability issues were associated with design of the East Span structures on and in the vicinity of YBI (Caltrans 2001a). These issues included the stability of the east-facing slope of YBI and the potential for slope failures in the vicinity of the west foundation for the SFOBB East Span.

Existing landslides have been identified at various locations on YBI and appear to range from older, probably prehistoric, failures to recent failures. The modes of the slope failures include discontinuity controlled rock failures (due to weakness in the rock), relatively deep-seated rotational landslides, and relatively surficial failures. Rock-wedge failures[17] have occurred in the Franciscan Formation slopes surrounding the northeast point and eastern YBI tunnel approach. The sizes of the rock-wedge failures are variable and range up to in excess of 30.5 meters (100 feet) in width and length. Relatively deep-seated rotational landslides are located on the west and northwest of the eastern YBI tunnel approach area but appear to have occurred outside of the project area. The landslides appear to be older and probably failed prehistorically. A number of relatively shallow slope failures are located in unconsolidated sedimentary deposits on the southwest slope of the eastern YBI tunnel approach above the USCG station. These landslides are up to 45.7 (140.1 feet) meters high, 61 meters (200.1 feet) wide, and 6.1 meters (20 feet) thick. Some of the landslides have occurred recently. Additional debris-flow failures and zones of shallow creeping soils have been identified in the Franciscan Formation on the northwest and southeast slopes of the eastern YBI tunnel approach and on the east- and north-facing slopes of the northeast point.

GROUND SHAKING

During a major earthquake on a segment of one of the nearby faults, strong to very strong ground shaking is expected to occur at the project site. Strong shaking during an earthquake can result in ground failure.

There has been no significant earthquakes on YBI. Within the 40 or so years of high-resolution earthquake recording and roughly 1 million years for geology, the present San Francisco Bay domain has been essentially non-seismic and appears to be responding to tectonic stress only by long-term regional tilting down to the south (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010).

FAULT RUPTURE

Review of regional seismotectonics of the San Francisco Bay Area indicates that there are no known active faults in proximity of Yerba Buena Island and no historical earthquakes have been associated with fault rupturing on the island (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010).

Historically, ground surface displacements closely follow the trace of geologically young faults. The site is not within an Earthquake Fault Zone, as defined by the Alquist-Priolo

[17] A rock-wedge failure is characterized as a movement or sliding of a rock mass, possibly including overlying soil, along existing discontinuities such as fractures or joints within the rock fabric. Movement or sliding typically occurs along layers or zones of low shear strength materials that have formed within the rock mass. Uplifting, folding, and faulting may cause the rock to develop low shear strength.

Earthquake Fault Zoning Act, and no known active or potentially active faults exist on the site. Therefore, surface fault rupture at the site is unlikely (Draft Preliminary Foundation Report – Yerba Buena Island Interchange Ramp Project, San Francisco Bay Bridge, California, April, 2007; Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010). It should be acknowledged, however, that in a seismically active area, the remote possibility exists for future faulting in areas where no faults previously existed (Geotechnical and Geological Evaluation – Yerba Buena Island Viaduct Vulnerability Study, San Francisco, CA. November 10, 2006).

SOIL LIQUEFACTION AND ASSOCIATED HAZARDS

Liquefaction. Soil liquefaction is a phenomenon in which saturated (submerged) cohesionless soils lose their strength due to the build-up of excess pore water pressures, especially during cyclic loadings such as those induced by earthquakes. In the process, the soil acquires mobility sufficient to permit both horizontal and vertical movements, if not confined. Soils most susceptible to liquefaction are loose, clean, uniformly graded, fine-grained sands. Saturated silty sands may also liquefy during strong ground shaking. Liquefaction is generally considered possible when the depth to groundwater is less than about 15.2 meters (50 feet) below the ground surface.

The California State Geological Survey (CGS)[18] prepared a map titled State of California Seismic Hazard Zones, Oakland West Quadrangle Official Map, dated February 14, 2003. This map was prepared in accordance with the Seismic Hazards Mapping Act of 1990. Portions of the YBI Ramps Improvement Project site are located within one of the designated liquefaction hazard zones indicated on the map referenced above.

The subject site is underlain by competent medium dense to very dense silty sand and deep clay alluvium, particularly at depths where groundwater has been observed in few soil borings during wet seasons. Within the project area, the potential for soil liquefaction under these conditions is low and not considered a design issue (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010).

Lateral Spreading. Lateral spreading occurs when a continuous layer of soil liquefies at depth and the soil layers above move toward an unsupported face, such as an open slope cut, or in the direction of a regional slope or gradient.

The magnitude of lateral spreading movements depends on earthquake magnitude, distance between the site and the seismic event, thickness of the liquefied layer, ground slope or ratio of free-face height to distance between the free face and structure, fines content, average particle size of the materials comprising the liquefied layer, and the standard penetration rates of the materials. Due to a low site soil liquefaction potential, the potential for lateral spreading to impact the project corridor is low (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010).

[18] The map was published under the agency's previous title, the California Division of Mines and Geology (CDMG).

TSUNAMIS

Tsunamis are seismically induced “sea waves” that are generated when large subsea earth or rock masses are displaced during earthquakes or very large landslides. The low-amplitude very-long-period waves travel very quickly and increase significantly in size and height upon entering shallow water. The waves can cause significant damage to coastal areas.

According to the U.S. Geological Survey (USGS), the nearby SFOBB Oakland Touchdown area would be inundated with about 3 to 3.7 meters (9.8 to 12.1 feet) of water if a 6.1-meter (20-foot) wave were to occur at the Golden Gate.[19] Given the hypothetical nature of the information, it is likely the inundation level at the Oakland Touchdown area would be lower, at a level closer to 1 meter (3.3 feet). According to the USGS, the northeastern portion of YBI would not be inundated by a 6.1-meter (20 foot) tsunami, although lower-lying fill areas such as the USCG station could be subject to damage.

3.11.3 Environmental Consequences

NO BUILD ALTERNATIVE

Under the No Build Alternative, the existing on- and off-ramps would remain and no new ramps would be built.

ALTERNATIVE 2B AND ALTERNATIVE 4

As described above, there are preexisting slope stability and erosion problems on parts of YBI in the vicinity of the USCG facility. Slope stability issues for the SFOBB ESSSP were evaluated through geologic mapping performed on YBI, marine exploration, and laboratory testing of bedrock. Stability analyses for various potential slope failure modes were performed. The results showed that wedge failures were anticipated on YBI. Rock anchors with or without shotcreted wire mesh and rock bolts were recommended as project design features for the SFOBB ESSSP to prevent wedge failures.

Based on the preliminary foundation memorandum for the YBI project (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California , 2010) and draft preliminary foundation report for the YBI project (Draft Preliminary Foundation Report – Yerba Buena Island Interchange Ramp Project, San Francisco Bay Bridge, California, April, 2007), pile driving will be used to construct column and abutment foundations. The viaduct structure widening is recommended to be on 1,830-mm (72-inch) CIDH Type-1 cantilever shafts. All ramp abutments are recommended to be on driven HP 360x132 (HP 14x132) steel H piles. All bents are recommended to be on either HP 360x132 (HP 14x132) or 510-mm-diameter (24-inch) Cast-in-Drilled Hole (CIDH) piles.

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[19] A 6.1-meter wave approximates the wave that occurred at Crescent City, California as a result of the 1964 Alaskan earthquake.

3.11.4 Avoidance, Minimization, and/or Mitigation Measures

3.11.4.1 Alternatives 2b and 4

The preliminary foundation memorandum (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010) provides site-specific conclusions and recommendations about conditions at the YBI project site. Final determination of specific construction activities and design features planned at the project site would occur once a preferred project alternative is identified. Once an alternative has been selected, Caltrans would retain California-licensed geologists and geotechnical engineers to prepare a draft and final foundation report and to conduct a site-specific geotechnical study for the preferred alternative. This study would identify for the preferred alternative ramp alignment the presence of the hazards or conditions, as appropriate, including fault rupture hazard, soft-ground conditions, slope stability and landslides, strong seismic shaking, liquefaction and lateral spreading, settlement, and corrosive or expansive soil to affect concrete and steel. As part of the study, the geotechnical engineer would review the project plans and specifications to ascertain that geotechnical aspects of the project are addressed appropriately, including identifying corrective actions to avoid the hazard or support the design of engineering control measures. A liquefaction analysis would be conducted if the water table is determined to be above bedrock in loose to medium dense sands and the potential for liquefaction is of concern to the project design. Pile specifications would be developed, based on the results of the site-specific geotechnical study, along the proposed on-ramp and off-ramp alignment. Caltrans would document compliance with necessary avoidance and minimization measures prior to the final project design and final foundation report. The engineers would prepare a summary report that would document the investigation and detail the specific design support alternatives and protection measures that would be implemented.

The ramps project in coordination with Caltrans would ensure that slope stability impacting USCG property, or its 365/24/7 access, will be maintained. The geotechnical engineer would conduct inspections and testing during the following stages of construction:

- Grading operations, including excavations and compacted fill placement,
- Shoring installation,
- Removal or installation of support of buried utilities or structures,
- Pile installation,
- CIDH drilling prior to placement of steel reinforcement,
- Preparation of subgrade prior to placement of any overlying materials,
- Foundation construction,
- Backdrain construction,
- When any unusual subsurface conditions are encountered.

Additional effects of pile-driving vibration are addressed in Section 3.8, “Cultural Resources”; Section 3.15, “Noise”; and Section 3.17, Biological Resources.”

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3.12 Paleontology

3.12.1 Regulatory Setting

Paleontology is the study of life in past geologic time based on fossil plants and animals. A number of Federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of Federally authorized or funded projects. (e.g., Antiquities Act of 1906 [16 USC 431-433], Federal-Aid Highway Act of 1956 [23 USC 305]). Under California law, paleontological resources are protected by the California Environmental Quality Act.

3.12.2 Affected Environment

Background research identified that the geologic units within the project area have low to high paleontological sensitivity. A qualified paleontologist conducted a field survey of the project site on Oct. 15, 2010. The paleontologist observed all geologic units identified by Graymer et al. (2000), Radbruch (1957) and CMB *et al.* (2009) at the surface within the PSA or adjacent to the project footprint. No paleontological resources were observed during the survey. A site-specific paleontological identification report (PIR) was been prepared for the YBI Ramps Improvement Project:

- Draft Paleontological Identification Report for the Yerba Buena Interchange Ramps Improvement Project. December (2010). [Appendix P].

Additional geotechnical information (including paleontological information) has been provided for the entire project area in the following reports:

- Preliminary Draft Foundation Memorandum – Yerba Buena Island Ramps Improvement. December (2010).

- Draft Preliminary Foundation Report – Yerba Buena Island Interchange Ramp Project, San Francisco Bay Bridge. April (2007).

- San Francisco-Oakland Bay Bridge East Spans Seismic Safety Project Final EIR. May 8 (2001).

- Yerba Buena Island: Habitat Management Plan. December (2009).

GEOLOGICAL SETTING

The valley in which San Francisco Bay resides began to form around 2 to 3 million years ago, when the surrounding mountains and hills started to rise on either side. YBI lies within the San Francisco Bay and is thought to have been uplifted by faulting along a branch of the Hayward Fault approximately 1 million years ago (Yerba Buena Island: Habitat Management Plan , 2009). Yerba Buena Island is underlain by Franciscan Formation basement rock consisting of interbedded graywacke sandstone, siltstone and claystone of varying proportions. Bedrock on the island is covered by thin sandy deposits from the Pleistocene Colma formation or derived from the underlying sandstone.

Sand covers most of the bedrock on the island, except along the lower parts of the slopes where waves have cleaned the rocks, and on northeast point. Grading in the late 1930s at the northeast point removed up to 15.24 to 18.29 meters (50 to 60 feet) off the top of the hill exposing slightly weathered bedrock. Artificial fill at the northeastern tip of the island was created in 1943 by placing cut materials from Yerba Buena Island and dredged bay deposits.

Native soils on YBI range from ten to 40 inches in depth and have been highly altered throughout the island by grading, excavating, filling, and otherwise reshaping topography (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010; Yerba Buena Island: Habitat Management Plan, 2009).

JURASSIC/CRETACEOUS - THE FRANCISCAN COMPLEX

The Jurassic/Cretaceous-age Franciscan Formation forms the bedrock of YBI and consists of interbedded sandstone, siltstone and claystone. The Franciscan Complex is a melange of rock units that were variably deformed and metamorphosed in a subduction zone at the western edge of the North American Plate (Hamilton, 1969; Page, 1981; Wakabayashi, 1992). In the project area this unit is predominantly thick-bedded to massive sandstone with only a few thin beds of claystone or siltstone thus identifying it as part of the Alcatraz terrane. The bedding orientation dipping to the northeast is consistent with outcrops and other borings on the island (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010). The rock is commonly soft in the upper 1.52 to 4.57 meters (5 to 15 feet) where it has been altered by weathering.

PLEISTOCENE – COLMA FORMATION

The Colma Formation is late Pleistocene in age and is dated to 0.07-0.13 mya (Clifton et al. 1988; Konigsmark 1998). Sediments of the Colma Formation were deposited in either marine or non-marine environment (Clifton et al. 1987, 1988; Hengesh and Wakabayashi 1994). The Colma Formation may simply represent a facies change of the geological units known as Old Bay Mud or Yerba Buena Formation, which can be found in the presently marine environment underneath the bay bridge. Yate et al. (1990) describes the texture of the Colma Formation as "poorly unconsolidated sands" and muds. On Yerba Buena Island, the Colma Formation underlies Bay Mud and dune sand layers at varying depths and overlies the Franciscan Complex in some areas where it has not eroded away (Elder, 2001). Surface outcrops of the Colma Formation have not been identified on the island. The depth of Colma Formation on the Island is unknown. The geographically closest data concerning the depth of the Colma formation comes from cores taken east of YBI from underneath the Bay bridge. Here, the Colma formation has been identified to exist as close as 3.05 meters (10 feet) below Bay Mud (McGann et al., 2002). Because erosion rates can be higher on land than in a marine setting, it can be expected that the Colma formation exists at a depth of less than 3.05 meters (10 feet). An archaeological excavation identified a stratum that coincides lithologically with the Colma formation on YBI in a nearby location at a depth of 2 meters (6.5 feet) (Morgan et al., 2007). Geotechnical drilling for this project resulted in the identification of a lithological unit that coincides with the Colma Formation at a depth of approximately 2 meters (6.5 feet) (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010).

PLEISTOCENE TO RECENT - COLLUVIUM AND LANDSLIDE DEBRIS

A portion of the project area appears to have experienced shallow landslides. Similar but degraded slide scars can be seen on the slopes around the island indicating that these features have occurred in the past and are a recurring phenomenon. Landslides on YBI consist of two types: thin surficial soil slips and wedge failures involving Franciscan Formation bedrock. These landslides are generally small and occur where slopes have been over-steepened by erosion and excavations. The depth of these slides was on the order of about 0.61 to 1.52 meters (2 to 5 feet).

PLEISTOCENE TO RECENT - DUNE SAND AND ALLUVIUM

Quaternary dune sands typically cover the Colma Formation. Some of these dune sands were carried by the Sacramento River system through the Golden Gate and were deposited in eolian environment (Konigsmark 1998). The sands, characterized by excessive drainage of water, extended throughout most of western San Francisco before its development (Sullivan and Galehouse 1991), and supported the native grassland and scrub vegetation that once were widely distributed throughout the San Francisco peninsula.

The alluvium is composed primarily of fine-grained sand and silty sand with a few scattered silt and clay lenses. The material is loose to very dense and generally moist except on the upper slopes where it is locally dry to moist. The deposits are thick-bedded to unbedded; where bedding occurs it is generally horizontal to dipping about 20 degrees.

The great thickness and fine-grained nature of the sands along with their poor grading and widespread distribution in pockets across the island suggests these materials originated as wind-blown sands similar to those occurring on much of the San Francisco Peninsula. An archaeological excavation identified a stratum that coincides lithologically with the San Dunes on YBI in a nearby location between 0 to 2 meters (0 to 6.5 feet) (Morgan et al., 2007).

RECENT – ARTIFICIAL FILL

Fill occurs locally across the island as road base, foundation support, and landscaping soil. Fill also occurs as uncompacted cast-over or disturbed surficial slough from the various historical development activities. Along the many roads around the island, cast-over grading material from the road building activities overlies, and is gradational with, native slope-wash sedimentary alluvium. Artificial fill occurs along the island shoreline east and south of the Northeast Point at the Torpedo Building and Torpedo Road, and in the USCG base in the southern Saddle Area. Most of the present USCG Station is entirely on fill first placed around 1934.

The fill material within the Southern Saddle Area is up to about 9.14 meters (30 feet) thick. Exploratory excavation indicated the upper portion of the fill consists of moist, loose to medium dense, fine grained sands with some gravel. The lower portion consists of a coarser fraction composed of sand and gravel material with large angular cobbles and boulders of the Franciscan Formation sandstone and siltstone.

LITERATURE SURVEY AND FOSSIL LOCALITY SEARCH

The results of the literature review and the online fossil locality search using the Berkeley Natural History Museum (BNHM) online database, which includes data from the University of California, Museum of Paleontology (UCMP) found 122 fossil localities within San Francisco County. These include 1 specimen from the Jurassic, 4 from the Cretaceous, 3 from the Miocene, 6 from the Pliocene, 102 from the late Quaternary, 1 from the Holocene and 5 of unknown age.

FRANCISCAN COMPLEX AND ALCATRAZ TERRANE

The Franciscan formation is heavily deformed and metamorphosed in many locations, and whatever fossils existed in these strata have been destroyed. Fossils from the Franciscan formation are therefore generally rare and are all the more important, because they can provide information on the age of a particular sedimentary suite, fixing it in the comparatively vast 150 million years spanned by the formation. Fossils recorded from the Franciscan formation of coastal California include trace fossils (preserved tracks or other signs of the behaviors of animals), mollusks, and marine reptiles.

The Alcatraz Terrane, the portion of the Franciscan complex found within YBI, contains fossils. In fact, the first fossil ever found in what was then called the Franciscan Formation, came from the Alcatraz Terrane (Graymer et al. 2000). This fossil consisted of an Inoceramus ellioti of Cretaceous age. Subsequent fossil discoveries include several other mulloskan fossils of Cretaceaous age. While all other terranes of the Franciscan Complex usually carry a moderate paleontological sensitivity, the fossil finds of the Alcatraz Terrane are highly important in contributing to the understanding of the depositional environment thus giving this unit on YBI a high paleontological sensitivity.

COLMA FORMATION

The Colma Formation has produced significant marine and terrestrial fossils in the past. Rodda and Baghai (1993) reported bones and teeth of mammoth and extinct bison from sands and clays unconformably overlying the Franciscan Complex that they refer to as the Colma Formation. Marine facies of the Colma Formation have produced marine megafossils, marine and nonmarine diatoms, and sponge spicules (Schlocker, 1974). Savage (1951) listed other vertebrate fossil localities in the San Francisco Bay region to which he assigned an “undifferentiated Pleistocene” age. Some of these additional vertebrate fossils may also be referable to the Colma Formation. Schlocker (1974) reported fossil plant remains and a peat layer at the top of his Colma Formation possibly representing “an old soil that developed in or near local marshes or lakes.” Within San Francisco this geological unit is the most abundant collection of Pleistocene vertebrates. On YBI, the Colma Formation has not been mapped and is not known to occur in surface deposits but is likely to overlie portions of the Alcatraz Terrane, beneath deposits of dune sand or Old Bay Mud. This geological unit has a high paleontological sensitivity.

COLLUVIUM AND LANDSLIDE DEBRIS

These deposits are generally considered to be too young to contain significant fossils (10,000 years old to recent). They are less likely to contain well-preserved fossils than intact older parent deposits, and are thus considered to have a low paleontological resource potential.

DUNE SAND AND ALLUVIUM

Dune sand and alluvium are intermixed in the project area and are thus considered together. They consist of Holocene to Pleistocene sediments, increasing in age with depth (Graymer 2000). Due to their lack in of good preservational abilities, Pleistocene dune sands rarely contain fossils. This geological unit has a low paleontological sensitivity.

ARTIFICIAL FILL

Artificial fill could have fragmentary fossil material transported from other sites. Even if such were the case, this material would be out of stratigraphic context and, therefore, have no scientific value and minimal, if any, educational value due to its lack of context and fragmentary nature. Therefore, artificial fill has a low paleontological sensitivity.

3.12.3 Environmental Consequences

Construction activities can impact paleontologically sensitive geologic units when vehicles or other work equipment impact previously undisturbed sediments by excavating, grading, or crushing bedrock exposed in or underlying a project. This can result in significant impacts to fossils by destroying them or otherwise altering them in such a way that their scientific value is lost.

Paleontological resources include fossil plants and animals and other evidence of past life such as preserved animal tracks and burrows. Determination of the “significance” of a fossil can only occur after a fossil has been found and identified by a qualified paleontologist. Until then, the actual significance is unknown.

The most useful designation for paleontological resources in an EIR document is the “sensitivity” of a particular geologic unit. Sensitivity refers to the likelihood of finding significant fossils within a geologic unit. As identified by the Society of Vertebrate Paleontologists (SVP), the paleontological sensitivity of a geologic unit is determined by its potential to contain paleontological resources (SVP 1995). The paleontological sensitivity of a geologic unit may be classified as:

High Potential. Rock units are considered to have a high potential for containing significant non-renewable fossiliferous resources if vertebrate or significant invertebrate fossils or significant suites of plant fossils have been recovered. These units include, but are not limited to, sedimentary and volcanic formations that contain significant nonrenewable paleontological resources and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both of the following: (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils that are large or small, vertebrate, invertebrate, or botanical; and, (b) the importance of recovered evidence for new and significant taxononic, phylogenetic, ecologic, or stratigraphic data. Areas that contain potentially datable organic remains older than recent areas that may contain new vertebrate deposits, traces, or trackways are also classified as significant.

Undetermined Potential. Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossilferous potentials. Field surveys by a qualified vertebrate paleontologist to specifically determine the potentials of the rock units are required before programs of impact mitigation for such areas may be developed.

Low Potential. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils. Such units will be poorly represented by specimens in institutional collections. These deposits generally will not require protection or salvage operations.

Caltrans uses a similar three-part scale for assessing the sensitivity or potential for a particular rock unit to contain paleontological resources (Caltrans 2007). These two classification systems are compatible. In most cases, decisions about how to manage paleontological resources must be based on this potential because the actual situation can not be known until construction excavation for the project is underway:

High Potential. Rock units which, based on previous studies, contain or are likely to contain significant vertebrate, significant invertebrate, or significant plant fossils. These units include, but are not limited to, sedimentary formations that contain significant nonrenewable paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. These units may also include some volcanic and low-grade metamorphic rock units. Fossiliferous deposits with very limited geographic extent or an uncommon origin (e.g., tar pits and caves) are given special consideration and ranked as highly sensitive. High sensitivity includes the potential for containing: (1) abundant vertebrate fossils; (2) a few significant fossils (large or small vertebrate, invertebrate, or plant fossils) that may provide new and significant taxonomic, phylogenetic, ecologic, and/or stratigraphic data; (3) areas that may contain datable organic remains older than Recent, including Neotoma (sp.) middens; or (4) areas that may contain unique new vertebrate deposits, traces, and/or trackways. Areas with a high potential for containing significant paleontological resources require monitoring and mitigation.

Low Potential. This category includes sedimentary rock units that: 1) are potentially fossiliferous, but have not yielded significant fossils in the past; 2) have not yet yielded fossils, but possess a potential for containing fossil remains; or 3) contain common and/or widespread invertebrate fossils if the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood. Sedimentary rocks expected to contain vertebrate fossils are not placed in this category because vertebrates are generally rare and found in more localized stratum. Rock units designated as low potential generally do not require monitoring and mitigation. However, as excavation for construction gets underway it is possible that new and unanticipated paleontological resources might be encountered. If this occurs, a Construction Change Order (CCO) must be prepared in order to have a qualified Principal Paleontologist evaluate the resource. If the resource is determined to be significant, monitoring and mitigation is required.

No Potential. Rock units of intrusive igneous origin, most extrusive igneous rocks, and moderately to highly metamorphosed rocks are classified as having no potential for containing significant paleontological resources. For projects encountering only these types of rock units, paleontological resources can generally be eliminated as a concern when the PEAR is prepared and no further action taken.

SVP identifies vertebrate fossils, their taphonomic and associated environmental data, and fossiliferous deposits as significant nonrenewable paleontological resources. Botanical and invertebrate fossils and assemblages may also be considered significant (SVP 1995). Due to the rarity of fossils and the scientific information they provide, a paleontological resource can be considered significant (Scott and Springer 2003) if the resource does any of the following:

- Provides data on the evolutionary relationships and developmental trends among organisms, both living and extinct;
- Provides data useful in determining the age(s) of the geologic unit or stratigraphy, as well as timing of associated geological events;
- Provides data on a community level;
- Demonstrates unusual or spectacular circumstances in the history of life; and / or
- Is not abundant or found in other geographic locations and may be in danger of being depleted or destroyed by the elements or vandalism.

Significant paleontological resources must be diagnostic to determine if any of the criteria above is applicable. Proper identification of paleontological resources is often difficult in the field; therefore, the recovery, preparation and analysis of paleontological resources is necessary to determine their significance (Scott and Springer 2003). This process must be done by, or under the supervision of, a qualified paleontologist (Conformable Impact Mitigation Guidelines Committee 1995). Microvertebrate fossils are generally not visible to the naked eye; although initial sifting may be conducted in the field, analysis for microinvertebrates requires laboratory processing of bulk samples from paleontologically sensitive geologic units (Conformable Impact Mitigation Guidelines Committee 1995; Scott and Springer 2003).

3.12.3.1 No Build Alternative

Under the No Build Alternative, the existing on- and off-ramps would remain and no new ramps would be built.

3.12.3.2 Alternative 2b and Alternative 4

Ground-disturbing activities associated with the construction of the build alternatives within the PSA could potentially impact paleontological resources. These activities include:

- Grading operations, including excavations and compacted fill placement,
- Shoring installation,
- Removal or installation of support of buried utilities or structures,
- Preparation of subgrade prior to placement of any overlying materials,
- Foundation construction,
- Backdrain construction,

- When any unusual subsurface conditions are encountered.

The paleontologically sensitive Franciscan Complex/Alcatraz Terrane can be found directly underneath the paleontologically sensitive Colma Formation, and both may be affected by construction activities.

3.12.4 Avoidance, Minimization, and/or Mitigation Measures

3.12.4.1 Alternatives 2b and 4

In general, avoidance and minimization are not feasible with regard to addressing significant impacts on paleontological resources. Geologic formations are usually extensive, and project design cannot be adjusted sufficiently to effectively avoid or minimize paleontological impacts. As a result, mitigation is the approach generally taken to address paleontological impacts.

A Paleontological Mitigation Plan (PMP) would be prepared under the direction of a qualified Principal Paleontologist and including: general fieldwork and laboratory methods proposed, curation requirements, report format and content, distribution and proposed staff and their qualifications. The PMP would include mitigation measures adequate for the recovery of samples and would also serve as a basis for obtaining any necessary permits from other agencies.

Caltrans will retain a qualified principal paleontologist (MS or PhD in paleontology or geology familiar with paleontological procedures and techniques). The paleontologist will review the selected alternative alignment and design, once a preferred project alternative is identified; determine the potential for discovery of significant fossils; and identify specific mitigation measures as needed. Caltrans will implement the following mitigation measures as applicable to the selected alternative:

a. A qualified paleontologist will be present to consult with grading and excavation contractors at pre-grading meetings.

b. A paleontological monitor, under the direction of the qualified principal paleontologist, will be on site to inspect cuts for fossils at all times during original grading involving sensitive geologic formations.

c. When fossils are discovered, the paleontologist (or paleontological monitor) will recover them. Construction work in these areas will be halted or diverted to allow recovery of fossil remains in a timely manner.

d. Fossil remains collected during the monitoring and salvage portion of the mitigation program will be cleaned, repaired, sorted, and cataloged.

e. Prepared fossils, along with copies of all pertinent field notes, photos, and maps, will then be deposited in a scientific institution with paleontological collections.

f. A final report will be completed that outlines the results of the mitigation program.

In addition, the following mitigation measures should be implemented during the appropriate periods of project implementation.

ONSITE TRAINING

Onsite training should be conducted for all construction personnel who will work in excavated areas in the of the project area. Training will discuss the types of paleontological resources that could be encountered on the project and the procedures to be followed if they are discovered.

MONITORING OF CONSTRUCTION ACTIVITIES

Ground disturbing excavations include pile driving and column foundation construction. The minimum excavation depth for these construction activities is approximately 12.2 meters (40 feet). Ground disturbing activities are expected to penetrate paleontologically sensitive units throughout the PSA.

Monitoring of project-related, ground-disturbing activities within the Franciscan Complex and the overlying Colma formation should occur. The following includes the areas and depth parameters when monitoring should occur:

- In areas where the Franciscan Bedrock is mapped (as shown on Figure 1, Appendix P).
- If ground disturbances exceed 2 meters (6.5 feet) in depth in the areas mapped as Dune Sand and Alluvium (as shown on Figure 1, Appendix P).
- If ground disturbances exceed 2.6 meters (8.5 feet) where Colluvium and Landslide Debris are mapped (2 meters [6.5 feet] for Dune Sands and 0.6 meters [2 feet] for Landslides) (as shown on Figure 1, Appendix P).
- If ground disturbances exceed 9.1 meters (30 feet) in depth the southern saddle area where Manmade Fill is mapped (as shown on Figure 1, Appendix P).

Monitoring should continue until a paleontologist has determined that the paleontologically sensitive units are not being impacted or do not contain paleontological materials. Periodic sampling of excavated material of the Franciscan Complex and Colma Formation will determine whether they contain sensitive paleontological resources. Monitoring, sampling, data recovery, reporting, and curation activities should take place in accordance with the professional standards determined by the Society of Vertebrate Paleontology (Conformable Impact Mitigation Guidelines Committee 1995).

UNANTICIPATED DISCOVERY

In the event fossils are discovered in an area where monitoring is not being performed, the following guidelines should be followed:

- Stop all construction work within a 15.24 meter (50 foot) radius of the find until a qualified paleontologist can assess the significance of the find. If the discovery is significant or potentially significant, then potential mitigation will include:
    - Data recovery and analysis,
    - Preparation of a data recovery report, and
    - Accessioning recovered fossil material to an accredited paleontological repository, such as the University of California’s Museum of Paleontology.

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3.13 Hazardous Waste/Materials

A Hazardous Wastes Assessment (HWA) was conducted for the SFOBB ESSSP in 1998 to identify potential contaminant sources adjacent to and within that project's vicinity that would potentially affect design and construction of the SFOBB East Span (Caltrans 1998a). For purposes of that assessment, potential contaminant sources are facilities that treat, store, or dispose of hazardous waste; use hazardous substances; store petroleum products on-site; or otherwise may present a source of contamination to the project. Design and construction of a project may be affected by potential contaminant sources that are located within a project area, as well as potential contaminant migration to the project area from off-site sources.

The 1998 HWA evaluated an area that extends between the YBI tunnel east portal to the end of SFOBB East Span construction in the Oakland Touchdown area. The limits of the area evaluated in the HWA extend 100 meters (328 feet) out from and parallel to the outermost edge of the various SFOBB ESSSP alternatives that were under consideration at the time the HWA was prepared. The area encompassed a large part of the northeastern tip of YBI, which is where the YBI Ramps Improvement Project would be implemented. Therefore, the SFOBB ESSSP HWA is relied upon in this hazardous waste/materials section to help describe existing conditions at the proposed project site and identify potential impacts associated with the project.

In November 2008, the U.S. Navy completed an updated Site Management Plan (SMP) for NSTI (Tetra Tech 2008). This plan provides the annual status of strategies for ongoing basewide environmental programs and updates schedules whereby these strategies are being implemented. This plan provides updated information regarding various hazardous materials sites identified in the 1998 HWA.

A Phase I Initial Site Assessment (ISA) was used to update information on the presence of hazardous waste and materials on YBI (Preliminary Phase I ISA Report, Yerba Buena Island Ramps Improvement Project, Yerba Buena Island, San Francisco County, California. June 8, 2010).

3.13.1 Regulatory Setting

Hazardous materials and hazardous wastes are regulated by many state and Federal laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health, and land use.

The primary Federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for "cradle to grave" regulation of hazardous wastes. Other Federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- CWA
- CAA
- Safe Drinking Water Act

- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, EO 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when Federal activities or Federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of RCRA and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

Worker health and safety, and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during project construction.

The Residential Lead-Based Paint Hazard Reduction Act of 1992, Title X of the Housing and Community Development Act (Public Law No. 102-550), applies at NSTI. As part of Title X, Congress amended the 1971 Lead-Based Paint Poisoning Prevention Act (U.S.C. Sections 4801–4846) and added a new Title IV to TSCA. Under this law, certain Federally owned housing constructed before 1960 must be inspected for lead-based paint (LBP), and LBP hazards must be abated. In addition, Federally owned housing constructed after 1960 and before 1978 must be inspected for LBP hazards and the results disclosed to prospective property recipients (42 U.S.C. Section 4822).

3.13.2 Methodology

This section has been prepared on the basis of several reports prepared for the project site. The HWA was conducted in 1998 (Caltrans 1998a) to identify potential contaminant sources that may exist in the project area. The assessment consisted of various tasks, including an existing data review, regulatory database search, historical information update, and a site reconnaissance. In 2008, the U.S. Navy prepared the final site management plan for the naval station at Treasure Island, including the installation on YBI, which addressed remediation and closure timeframes for contaminated sites at both locations. This management plan was finalized and approved by the U.S. Naval Facilities Engineering Command as part of the base closure process. More recently, a Phase I ISA was prepared (Preliminary Phase I ISA Report, Yerba Buena Island Ramps Improvement Project, Yerba Buena Island, San Francisco County, California. June 8, 2010) that reviewed more recent documents and updated the findings of contamination to include additional contaminants and sites that have been remediated. No direct consultation has occurred with state or Federal agencies.

3.13.3 Study Limitations

A definitive evaluation regarding the actual presence or absence of contamination was not addressed in the HWA. The intent of the assessment was to identify reported and obvious potential hazardous conditions that would need to be addressed or considered before proceeding with project construction. The assessment did not guarantee, imply, or assert that all potential contaminant sources were located, due to the possible presence of an unlisted or unidentified contaminant occurrence.

3.13.4 Affected Environment

The following studies have been used in preparing this analysis of hazardous waste and materials effects for the YBI Ramps Improvement Project:

- Preliminary Phase I ISA Report – Yerba Buena Island Ramps Improvement Project, Yerba Buena Island, San Francisco County, California. June 8 (2010). [Appendix O]

- San Francisco-Oakland Bay Bridge East Span Seismic Safety Project: Hazardous Wastes Assessment. September (1998a).

- Final Site Management Plan: Naval Station Treasure Island. November (2008).

Land use within YBI has historically been dominated by various branches of the U.S. military. YBI was initially privately owned from about 1835 to 1867, when the U.S. Army established a post on the island, forcing the end of private ownership. A lighthouse was constructed in 1875 by the Department of Treasury, and it was operated until 1939 at which point the Service was transferred into the USCG. The U.S. Navy became the primary occupant in 1898 and established a recruit training station and other uses such as artillery storage, prison, machine shop, paint shop, hospital, and mess halls. The U.S. Navy also operated fueling docks, dryland fueling stations, and aboveground storage tanks for the storage of gasoline, heating oil, and kerosene. After World War II, the primary uses of YBI by the U.S. Navy and U.S. Army were as barracks and offices.

Construction of the SFOBB began in 1933 and was completed in 1936. Waste rock material from tunneling through a portion of YBI was used as fill material to increase the size of the island in the vicinity currently occupied by the USCG.

Current land uses on YBI include housing, open space, and USCG Sector San Francisco; the U.S. Navy currently does not house any personnel on the island. The USCG facility occupies 19.39 hectares (47.9 acres) of land on YBI. Facilities associated with the operations of the facility include maintenance, barracks, mess hall, offices, buoy repair area, residences, wharves and piers, and recreational facilities.

Several buildings on the island were previously being used by Caltrans. Buildings 15 and 29 were being used as a substation/air compressor house and as a tow truck housing facility, respectively; both buildings have been demolished and replaced.

3.13.5 Environmental Consequences

3.13.5.1 U.S. Navy Investigations

The U.S. Navy occupies a significant portion of the project area on YBI. The U.S. Navy, as part of an Installation Restoration Program (IRP) for NSTI/YBI, established a Federal Facility Site Remediation Agreement among the U.S. Navy, the California Department of Toxic Substances Control (DTSC) and RWQCB. Under this agreement, the U.S. Navy agreed to undertake and report on specified tasks associated with environmental assessment and response actions at 25 Installation Restoration (IR) sites under the IRP in accordance with CERCLA. Those actions have been ongoing since the early 1990s and are reported on in the 1998 HWA and the 2008 Final Site Management Plan, as well as summarized in the 2010 Phase I ISA for the YBI project. This section briefly summarizes relevant details of those investigations and their resolution or ongoing investigation.

The Navy transferred ownership of Sites 8, 11, and 29 to Caltrans through FHWA. The data review conducted as part of the HWA identified the following potential contaminant sources on the YBI Ramps Improvement Project site:

- IR Site 8 – the Former U.S. Army Point Sludge Disposal Area (pesticides, heavy metals including beryllium and lead);
- IR Site 11 – the Former Landfill (acetone, benzene, polynuclear aromatic hydrocarbons, phenols, pesticides, diesel);
- IR Site 29 – East Side Contaminated Bridge Soils (lead, petroleum hydrocarbons);
- Site 270 – Leaking Underground Storage Tank (LUST) site associated with Building 270 (diesel fuel).

The identified sites are also shown in Figure 3.13-1. Delineation of the extent of each of the IR sites has been completed. IR Site 270 has received a No Further Action (closure) letter from the Regional Water Quality Control Board and the tank has been removed. IR sites 8, 11, and 29 have been conveyed to Caltrans, but as of June 2010 the Navy is preparing a Remedial Investigation (RI) for them (Preliminary Phase I ISA Report – Yerba Buena Island Ramps Improvement Project, Yerba Buena Island, San Francisco County, California. June 8, 2010) while also entering into discussions with Caltrans regarding site closeout.

Investigations at the site were also conducted under the Residential Lead-Based Paint Program and the Asbestos-Containing Material Program, as summarized below. Appendix O provides a detailed narrative of all investigations on the YBI project site as discussed in the 1998 HWA, the 2008 SMP, and the 2010 Phase I ISA.

IR Site 8 – Former U.S. Army Point Sludge Disposal Area

IR Site 8 is located immediately north of the SFOBB East Span on relatively flat terrain with gentle downward slopes on the western edge and much steeper slopes on the northern and eastern edges. The site was formerly the site of personnel quarters; however, only the concrete foundations of these structures remain. The site was used as a disposal area for sewage sludge from the wastewater treatment facility on TI between 1968 and 1976 after the personnel quarters were demolished.

Waste sludge was transported from the treatment facility and spread on the ground between the foundations to dewater the sludge. The final disposition of the sludge is not known; the dried sludge may have been allowed to dewater and decay in place or may have been removed. Due to the shallow depth of bedrock at this site, on-site burial is reportedly unlikely.

Source: TerraServer 2004; EDAW, County of San Francisco

Figure 3.13-1
Potential Contamination Sources

Analytical soil testing, conducted for a 1990 site investigation (SI), indicated detectable concentrations of the organochlorine pesticides DOD, DOE, and DDT in concentrations ranging from 54 to 1,100 micrograms per kilogram (µg/kg).

Remedial investigations (RIs) in 1992 and 1995 indicated that semivolatile organic compounds (SVOCs) were detected in two surface soil samples collected at opposite ends of the sludge disposal area. Metals were detected in all soil samples. Concentrations of aluminum, barium, beryllium, cobalt, copper, lead, manganese, mercury, nickel, silver, and vanadium were detected above YBI background concentrations In 1997, a draft RI report included results of additional investigations conducted during Phase I and Phase IIB of the RIs completed in 1992 and 1995, along with a human health risk assessment. The 1997 RI report noted potential beryllium and lead contamination at the site; however, concentrations of beryllium and lead were within the target risk range or below the point of departure. (Under EPA programs such as CERCLA and RCRA that address potential health risk from exposure to hazardous waste sites, an acceptable target risk range of 1 chance in 1 million to 100 changes in 1 million is used for determining acceptability of potential cancer risk. The point of departure is the contaminant level used to determine whether a potential health or environmental problem exists.) Pesticides/PCBs and SVOCs were determined to not be contaminants of concern.

In June 2001, independent of the U.S. Navy's IR Program, Caltrans collected soil samples at 13 discrete surface soil locations on YBI as part of the SFOBB ESSSP (Tetra Tech 2008). Results of Caltrans' soil sampling conducted within the Site 8 boundaries indicated that concentrations of lead ranged from less than 50 to 170 milligrams per kilogram (mg/kg). Based on the Caltrans sampling report, the U.S. Navy concluded that existing data were sufficient to characterize the lateral and vertical distribution of lead in soils at Site 8.

The surface soil on the site may be contaminated by lead and other metals as a result of vehicle emissions and lead-based paint from bridge and ramp painting and maintenance, or these contaminants may have been present in the soil when the landfill was created. Two boundary changes have occurred at Site 8; the first eliminated the northwest corner of Site 8 to allow for transfer of the property as part of the YBI parcel, independent of regulatory closure of Site 8. The second boundary change, made in June 2005, eliminated overlap between CERCLA Site 8 and Site 29. Field inspections of Site 8 were performed in April and October of 2006 to verify removal of contaminated soil by Caltrans and to document ongoing construction activities. The U.S. Navy is finalizing an Interim RI Report for Sites 8 and 29, and is discussing site closeout with Caltrans (Final Site Management Plan: Naval Station Treasure Island. November, 2008).

IR 11 Site – Former Landfill

IR Site 11 is located immediately south of the SFOBB East Span. The site reportedly was used as a landfill by the U.S. Army and U.S. Navy from some time prior to 1935 to an undetermined date. The site, formerly a marsh, is identifiable as a dump on a 1935 topographic map of YBI.

Analytical results from the testing of the soil and fill material within the landfill indicated that acetone and benzene were the only VOCs detected. SVOCs consisting mainly of PAHs and phenols were detected, with the majority of the SVOCs detected at concentrations less than 1 mg/kg. Thirteen different types of pesticides were detected in the soil samples, but PCBs were not detected. TPH detected in the soil indicated diesel and weathered diesel were present in the soil/fill material. Metals detected above ambient concentrations included aluminum, barium, beryllium, calcium, cobalt, copper, lead, manganese, silver, thallium, vanadium, and zinc.

Analytical results from the testing of the groundwater indicated very low concentrations of VOCs, specifically benzene, carbon disulfide, and acetone; SVOCs; only one pesticide after several sampling events; 18 metals; and TPH as diesel and weathered diesel. Copper, lead, silver, and zinc may reach the shoreline at concentrations exceeding ambient water quality concentrations (AWQC). Concentrations of TPH/diesel in the groundwater exceed ecological TPH screening levels for TPH.

Miscellaneous household waste was noted in test pits installed during a Phase I RI. During evaluation of the extent of the landfill, construction debris was found in numerous trenches and test pits completed in 2002. Petroleum-contaminated sand was found in the landfill underlying a burn layer. Groundwater contamination was detected at the site and appeared to originate from the buried materials.

Additional sources of contamination at the landfill include five underground storage tanks (USTs) (270, and 204A through 204D) and a fuel pipeline. All four USTs have been removed. RWQCB concurred that no further action (NFA) was required with respect to the USTs in a letter dated June 17, 2004. The USCG Petroleum Program Site extends into the Site 11 boundary, and the USTs and fuel lines formerly located within the USCG site may be sources of contamination. Further investigations at the USCG site are pending.

The surface soil on the site may be contaminated by lead and other metals as a result of vehicle emissions and bridge and ramp painting and maintenance, or these contaminants may have been present in the soil when the landfill was created. As of June 2010, the U.S. Navy is preparing an RI report for Site 11 and is discussing site closeout with Caltrans.

IR SITE 29 – EAST SIDE CONTAMINATED BRIDGE SOILS

Historical maintenance and repair operations of the SFOBB east of the YBI tunnel's east entrance were identified as a potential source of contaminants to near surface soil. The soil beneath and surrounding the existing YBI on- and off-ramps and underneath the bridge was identified as contaminated by lead and other metals as a result of vehicle emissions, as well as bridge maintenance and painting operations.

Several shallow soil investigations were conducted by both the U.S. Navy and Caltrans. A U.S. Navy investigation identified elevated concentrations of lead as well as concentrations of barium, beryllium, copper, mercury, and nickel above YBI background concentrations. A surface soil and shallow subsurface soil sampling program conducted in October 1996 on behalf of Caltrans indicated elevated concentrations of lead in the surface soils above background conditions at almost all column sampling locations.

Petroleum-related investigations were performed within Site 29 boundaries, former fuel pipelines on the YF3 and USCG sites, and removed UST 270, formerly within the Site 29 boundaries. The U.S. Navy received an NFA closure letter from RWQCB for UST 270 in 2004.

An SI was performed by Caltrans in 2001 to chemically characterize soil and groundwater for potential contaminants that may be encountered during construction activities. Field inspections of Site 29 were performed in April and October of 2006 to verify removal of contaminated soil by Caltrans and to document ongoing construction activities. As of June 2010, the U.S. Navy is finalizing the Interim RI report for Sites 8 and 29, and is discussing site closeout with Caltrans.

RESIDENTIAL LEAD-BASED PAINT PROGRAM

All known lead-based paint has been removed from buildings constructed before 1960, and all buildings constructed in 1978 or before have been assessed for the presence of lead-based paint. A biennial monitoring and sampling program is performed by the U.S. Navy.

LBP may be present on the interior and exterior surfaces of nonresidential buildings at NSTI because many were constructed before 1978. Public Works Center Norfolk began inspecting the family housing at NSTI for LBP in 1995. In October 1999, Engineering Field Activity West documented a completed LBP assessment and a “mini” risk assessment of facilities on NSTI. Facilities were selected under the implementing regulations for Title X of the Housing and Community Development Act. Pursuant to Title X, not all facilities require an inspection for LBP.

To date, LBP at all pre-1978 residential housing on TI and YBI has been assessed. LBP at all pre-1960 YBI residential housing has been abated, and hazard reduction measures were put in place to protect the residents. To ensure all hazard reduction measures remain protective, a reevaluation survey is conducted every 2 years per the recommended U.S. Department of Housing and Urban Development (HUD) schedule. LBP in residential housing on YBI was reevaluated between April and May 2004 and again between May and July 2006. The next LBP reevaluation of the residential housing on YBI is scheduled for within 1 year of transfer. Residential housing on TI is to be reevaluated within 1 year of transfer. LBP maintenance was conducted during the winter of 2006 at Quarters 2 through 7, 240, 83, and 61.

Soil samples were also collected to evaluate the status of drip line and midyard areas at representative TI and YBI residential buildings. Based on the analytical results, soil abatement of the planter boxes and drip line areas was conducted in accordance with Title X, HUD, and U.S. Navy Policy at Quarters 1/Nimitz House through 7, 10, and Buildings 62, 83, 205, and 230 on YBI. HUD guidelines state only bare soils may pose a hazard, and soils covered by grass, concrete, or asphalt are protective. Any future disturbance of the grass, concrete, or asphalt at these buildings would require further soil evaluation for lead. The U.S. Navy would either abate or require the transferee to abate any LBP hazards found in existing residential facilities within 1 year of being transferred. If an existing residential facility is scheduled for demolition or nonresidential use, it would not be inspected or abated of LBP.

ASBESTOS-CONTAINING MATERIAL PROGRAM

All known damaged, friable, or accessible asbestos-containing material (ACM) has been removed within most areas of TI and YBI, including the area of Quarters 10/Building 267 (these two buildings would be relocated during implementation of Alternative 2b). It is not anticipated that remaining ACM would pose a threat to human health, however the measures listed below in Section 3.13.8 would be applied to ensure safety if the buildings were moved.

Beginning in 1995, several surveys to identify the presence of ACM have been completed at NSTI. Remedies for ACM were implemented.

Friable, accessible ACM identified during surveys was remediated beginning in 1998 All known damaged, friable, or accessible ACM has been abated within most areas of TI and YBI, including the area of Quarters 10/Building 267. It is not anticipated that remaining ACM would pose a threat to human health, however the measures listed below in Section 3.13.8 would be applied to ensure safety if the buildings were moved.

Notices and restrictions related to asbestos were identified in the U.S. Navy's Finding of Suitability to Transfer (FOST) for both TI and YBI dated February 15, 2006, and March 23, 2006, respectively. A biennial monitoring and sampling program is performed by the U.S. Navy. A reevaluation of ACM was scheduled to begin in 2008; no update has been provided as of June 2010.

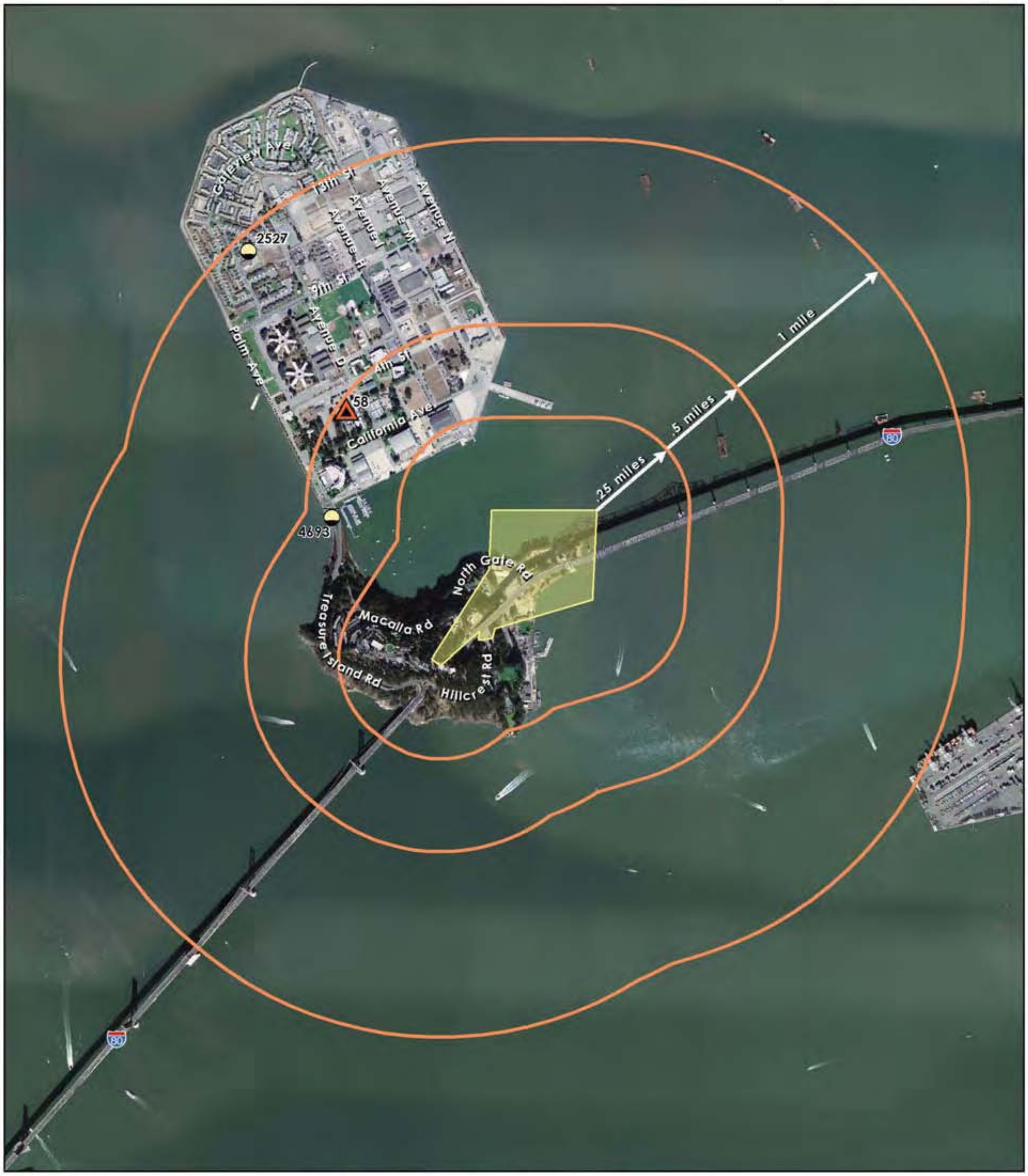
3.13.5.2 Regulatory Database Search

Database search results conducted for the YBI area identified and plotted one National Priorities List (NPL) site and two LUST sites within the search criteria. These sites are shown on an Environmental Risk Information & Imaging Services (ERIIS) database search map included as Figure 3.13-2. The database describes the single NPL site as Treasure Island Naval Station - Hunters Point Annex. In a conversation with Mr. James Sullivan, Base Reuse and Closure Environmental Coordinator for NSTI, he stated that TI is not an NPL site; rather, the Hunters Point Annex is on the NPL list. The Naval Hunters Point Annex is located in the vicinity of Candlestick Park, approximately 11.3 kilometers (7 miles) southwest of YBI across open water. Therefore, the plotted location on the ERIIS database search map should be considered a misplot. Due to the distance from the project area, the Hunters Point Annex NPL site should not have an impact on activities associated with the YBI Ramps Improvement Project.

One LUST site (Map ID site 2527), the Auto Hobby Shop/Building 225, is located on the western edge of TI. This site is located approximately 1.6 kilometers (1 mile) northwest of the project area. This site would not conflict with the project area due to its distance from it.

The other LUST site (Map ID site 4693) is located on USCG property. The database did not provide sufficient information as to the exact name or location for this site. Information provided by the RWQCB indicates that this site is listed as Building 40 of the USCG station. The two different case numbers (Case No. 10647 and 38-0794) provided in the ERIIS database report both reference the same site. Additional information regarding the investigatory status of this site is not available.

Unplottable “orphan” sites identified in the database search were reviewed individually as to general location and the type of environmental database listing. All sites in Alameda County and San Francisco County were eliminated because landfall from the island is over 6.4 kilometers (4 miles) away in any direction. Unplottable sites identified on TI were also eliminated due to their location and distance from the project area. The unplottable sites identified on the USCG base are either RCRA generators, with no



Study Site

American Society for Testing and Materials buffer

Leaking Underground Storage Tank

National Priorities List Site

Source: TerraServer 2004; EDAW, ERIIS, 1997

Not To Scale

Figure 3.13-2
ERIIS Site Information Map

impact, or possible impacts associated with the unplottable sites that have been identified through other tasks, as in Building 270.

A Preliminary Phase I ISA Report for the YBI Ramps Improvement Project was used to update previous information. Findings of the report are as follows:

- Parts of three IR sites - IR 8 (a sludge spreading area), IR 11 (a landfill), and IR 29 (an area of known soil contamination possibly associated with former military operations or highway operations) - are within the project site. IR 270 (a closed LUST) is also within the project area. Soil and groundwater contamination by petroleum hydrocarbons, heavy metals, VOCs and SVOCs, and pesticides have been found on the IR sites. The extent of contamination has been delineated but RIs for IR 8, 11, and 29 are pending as of June 2010.

- Several other military sites are located on the western side of YBI or on TI. The potential for impact to the project site from these other sites appears to be low due to distance.

- The presence of documented soil and groundwater contamination at three IR sites within the project area constitutes a Recognized Environmental Condition pertaining to the project site.

- IR Site 270, which received a No Further Action letter in 2004, constitutes a Historical Recognized Environmental Condition. No immediate environmental concerns are evident in regard to this former LUST.

3.13.6 Temporary Impacts

The following discussion summarizes potential construction-related impacts associated with the project alternatives. Because the action alternatives would be implemented on sites that are located in the same general area, there is little variation in the types of impacts associated with them.

3.13.6.1 No Build Alternative

There would be no impacts associated with the No Build Alternative because this alternative would not result in the disturbance of sites potentially containing hazardous wastes.

3.13.6.2 Alternative 2b

Construction activities associated with this alternative could expose construction workers to the contaminated soil of IR Site 29. The project area is downgradient from known sites; therefore, there is a medium to high risk that hydrocarbons would be encountered during construction. Surface and shallow subsurface soil sampling and testing determined that the soil adjacent to the SFOBB bents and columns has been impacted by metals associated with past bridge maintenance and operations, and also by petroleum hydrocarbons at select locations. This alternative would also result in construction workers encountering IR Site 8, the former U.S. Army Point Sludge Disposal Area located in the vicinity of the Alternative 2b ramps alignment. Surface and shallow subsurface soil sampling and testing determined that the former sludge drying site is impacted by the presence of materials, especially beryllium and lead as chemicals of concern, and the presence of pesticides. Worker and public health issues during construction are a potential concern. Exposure pathways due to heavy construction traffic under dry, dusty conditions would include direct contact through ingestion, dermal contact, or inhalation.

Implementation of this alternative would involve relocation of Quarters 10/Building 267, both historic structures, to construct the alignment of the proposed ramps. Given the age of these buildings, it is expected that relocation could expose workers to hazardous materials such as ACM and LBP, if this procedure would disturb these materials. However, as of 2002, all known damaged, friable, or accessible ACM has been abated in these buildings; remaining ACM does not pose a threat to human health (U.S. Navy 2008). The measures listed below in Section 3.13.8 would be applied to ensure safety from any ACM that may be discovered if the buildings were moved.

3.13.6.3 Alternative 4

Construction activities associated with Alternative 4 would result in the impacts identified for Alternative 2b described above (except for impacts resulting from relocation of Quarters 10/Building 267), given that the ramps alignment proposed for Alternative 4 includes a large part of the area that would be covered by the Alternative 2b alignment. However, given that Alternative 4 would cover additional parts of YBI, exposure by workers to hazardous wastes located elsewhere in the project area could occur if Alternative 4 is implemented.

The SFOBB ESSSP HWA identified a groundwater petroleum plume associated with a LUST at Building 270. According to that report, the extent of the plume was undefined and additional sampling and testing were proposed. Three permanent groundwater monitoring wells installed at this location indicated that the groundwater table ranges from 1.5 to 1.8 meters (4.9 to 5.9 feet) above mean sea level. Analytical results indicated elevated concentrations of TPH/diesel (160,000 micrograms per liter [μg/L]) and TPH/gasoline (7,300 μg/L) in the upgradient monitoring well. IR Site 11, the former landfill, was identified as a potential source of these contaminants in the upgradient monitoring well. Construction of foundations in the TPH plume may also cause migration of contamination to other groundwater zones.

Construction impacts may also exist from the former fire station/gas station site at Building 204/208. This site appeared to be located upgradient from Building 270 and may be a possible source of groundwater contamination identified in the groundwater monitoring well immediately upgradient of Building 270. This alternative may result in impacts on workers if construction activity were to take place in this area.

3.13.7 Permanent Impacts

Impacts related to the use and transport of hazardous materials or the disturbance of hazardous waste sites would be limited to the construction period. Although a release of hazardous materials during the construction period may potentially have long-lasting effects, construction phase BMPs and mitigation measures would be implemented to address this potential issue. Therefore, no permanent impacts are anticipated for the No Build Alternative, Alternative 2b, or Alternative 4.

Notices and restrictions related to asbestos were identified in the U.S. Navy's Finding of Suitability to Transfer (FOST) for YBI dated March 23, 2006. Restrictions relating to operations at or use of Quarters 10/Building 267 would be held in compliance.

3.13.8 Avoidance, Minimization, and/or Mitigation Measures

3.13.8.1 Alternatives 2b and 4

Final determination of specific construction activities planned on or near a potential contaminant source would occur once a preferred project alternative is identified. Once a preferred alternative is identified, additional site-specific delineation of any remaining areas of unabated contamination would be performed to finalize details of construction, to detail procedures for handling of contaminated media, and to ensure worker safety during construction. This would include performance of a Phase 1 Hazardous Materials Site Assessment by qualified professional (e.g., a California Registered Environmental Assessor) in conformance with American Society for Testing and Materials standards. If the Phase I Environmental Site Assessment indicates that a release of hazardous materials could have affected soil or groundwater quality at the site, then the SFCTA would retain a qualified environmental professional to conduct a Phase II Environmental Site Assessment to determine the presence and extent of contamination at the site, in conformance with state and local guidelines and regulations. If the results of a Phase II assessment indicated the presence of hazardous materials, alteration of the project's design or a limited site remediation would be included in project specifications.

The SFCTA would require that its contractors comply with applicable requirements for worker safety during construction activities in the presence of contaminated soils.

Compliance with required laws and regulations through the project design and construction specifications would ensure that potential impacts associated with contaminated soils are minimized or avoided if possible.

As required by the Navy's Finding of Suitability for Transfer (FOST) (2006), the proposed deed for transfer of the YBI transfer parcel will contain applicable CERCLA 120(h) notices, covenants, and warranties, as well as the additional notifications and restrictions indicated in the FOST. These are notices of the presence of hazardous substances, asbestos-containing material in buildings and structures (for which cleanup has been completed, as described below), lead-based paint adjacent to Quarters 1 through 7 and 10 (reevaluated every 2 years), residual petroleum contamination at UST 66 (not part of the project site), ongoing petroleum corrective actions at YF3 (not part of the project site), and PCBs in Buildings 118 and 200 (not part of the project site).

The FOST includes the following restrictions:

- prohibiting installation of groundwater production wells at YF3 for use without written approval of DTSC and the Water Board until regulatory closure has been granted and until the restriction is no longer necessary;

- managing ACM in accordance with all applicable local, state and federal laws and other requirements relating to asbestos or ACM; restrictions applicable to Building 267 and Quarters 10; removal of ACM in accordance with all applicable local, state, and federal laws and other requirements relating to asbestos or ACM if discovered during use, occupancy, renovation, or demolition;

- occupancy restrictions on two vault rooms with elevated levels of PCBs (not part of the project site) which would require compliance with all regulations regarding PCBs as appropriate. If the Navy determines additional remedial activities are appropriate, these activities will be performed before transfer.

Regardless of which alternative is selected, the responsibility and cost of the remediation would be incurred by the responsible party as determined by hazardous waste laws.

3.13.8.2 Additional Measures for Alternative 2b

Building Relocations. All known instances of LBP and ACM at YBI have been abated and removed (U.S. Navy 2008). The measures listed below would be applied to ensure safety from any ACM that may be discovered if the buildings were moved. Contract specifications for relocation of Quarters 10/Building 267 would include procedures for the abatement, handling, and disposal of LBP and ACM (if this proves necessary during building relocation activity), as well as the health and safety of workers and nearby residents (including USCG and U.S. Navy personnel). Prior to building relocation, ACM and LBP surveys would be performed to identify these materials. All procedures and permitting requirements would be consistent with Caltrans' guidelines and all Federal, state, and local laws and regulations and coordinated with responsible parties and regulatory agencies. Notices and restrictions related to asbestos were identified in the U.S. Navy's Finding of Suitability to Transfer (FOST) for YBI dated March 23, 2006, and these restrictions would be complied with during construction and operations.

If surveys identify additional sources of LBP and/or ACM, workers performing activities on-site that may involve contact with contaminated soil, LBP, ACM, or groundwater would be required to have appropriate health and safety training in accordance with Federal and state regulations. To reduce the risk of exposure, a Worker Health and Safety Plan would be prepared and implemented during construction by a Certified Industrial Hygienist (CIH). The Health and Safety Plan would meet requirements of the Bay Area Air Quality Management District or other agencies as determined necessary for asbestos abatement and would include provisions for:

- Conducting preliminary site investigations and analysis of potential job hazards, including identification and removal of the potential UST;
- Personal protective equipment;
- Safe work practices;
- Site control;
- Exposure monitoring;
- Decontamination procedures; and
- Emergency response actions.

The plan would address reduction of potential worker, U.S. Navy and USCG personnel, and public exposure to airborne contaminants by incorporating dust suppression techniques in construction procedures. Procedures would be in place to handle contaminated soils and groundwater, and if encountered, would follow applicable regulations.

3.14 Air Quality

This section presents the regulatory framework for air quality management on a national, state, and regional level. A description of the existing air quality conditions in the YBI Ramps Improvement Project area is also provided. The air quality impact determinations from the *Air Quality Analysis, Yerba Buena Island Ramps Improvement Project* will also be summarized. See the *Air Quality Analysis, Yerba Buena Island Ramps Improvement Project* in Appendix L for a detailed description of the methodology and analysis of the proposed project's impacts to air quality.

3.14.1 Regulatory Setting

The Clean Air Act (CAA) as amended in 1990 is the Federal law that governs air quality. Its counterpart in California is the California Clean Air Act (CCAA) of 1988. These laws set standards for the quantity of pollutants that can be in the ambient air. At the national level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone, particulate matter (PM), lead, and sulfur dioxide (SO_2). Table 3.14-1, presents the NAAQS and California Ambient Air Quality Standards (CAAQS) along with the health and atmospheric effects, and typical sources associated with each pollutant.

Table 3.14-1: California and National Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard	National Standard	Health and Atmospheric Effects	Typical Sources
Ozone [a]	1 hour 8 hours	0.09 ppm 0.070 ppm	–[b] 0.075 ppm	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include a number of known toxic air contaminants.	Low-altitude ozone is almost entirely formed from reactive organic gases (ROG) and nitrogen oxides (NO_X) in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes. Biologically produced ROG may also contribute.
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm[c] 6 ppm	35 ppm 9 ppm –	Asphyxiant. CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.
Respirable Particulate Matter (PM_{10})[a]	24 hours Annual	50 μg/m^3 20 μg/m^3	150 μg/m^3 –	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).
Fine Particulate Matter ($PM_{2.5}$)[a]	24 hours Annual	12 μg/m^3	35 μg/m^3 15 μg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter—	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including

Pollutant	Averaging Time	State Standard	National Standard	Health and Atmospheric Effects	Typical Sources
Fine Particulate Matter ($PM_{2.5}$)[a]	24 hours Annual	12 μg/m^3	35 μg/m^3 15 μg/m^3	considered a toxic air contaminant—is in the $PM_{2.5}$ size range. Many aerosol and solid compounds are part of $PM_{2.5}$.	photochemical) reactions involving other pollutants including NO_X, sulfur oxides (SO_X), ammonia, and ROG.
Nitrogen Dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	– 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain.	Motor vehicles and other mobile sources; refineries; industrial operations.
Sulfur Dioxide (SO_2)	1 hour 3 hours 24 hours Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.030 ppm	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing.
Lead [d]	Monthly Quarterly	1.5 μg/m^3 –	– 1.5 μg/m^3	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also considered a toxic air contaminant.	Primary: lead-based industrial process like batter production and smelters. Past: lead paint, leaded gasoline. Moderate to high levels of aerially deposited lead from gasoline may still be present in soils along major roads, and can be a problem if large amounts of soil are disturbed.

Sources: California Air Resources Board Ambient Air Quality Standards chart, 11/17/2008 (http://www.arb.ca.gov/research/aaqs/aaqs2.pdf)

Sonoma-Marin Area Rail Transit Draft Air Pollutant Standards and Effects table, November 2005, page 3-52.

USEPA and California Air Resources Board air toxics websites, 05/17/2006

Notes: ppm = parts per million; μg/m^3 = micrograms per cubic meter

[a] Annual PM_{10} NAAQS revoked October 2006; was 50 μg/m^3. The 24-hr $PM_{2.5}$ NAAQS tightened October 2006; was 65 μg/m^3.

[b] 12/22/2006 Federal court decision may affect applicability of 1-hour ozone NAAQS. Prior to 6/2005, the 1-hour standard was 0.12 ppm. Case is still in litigation.

[c] Rounding to an integer value is not allowed for the State 8-hour CO standard. A violation occurs at or above 9.05 ppm.

[d] The ARB has identified lead, vinyl chloride, and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both ARB and USEPA have identified various organic compounds that are precursors to ozone and $PM_{2.5}$ as toxic air contaminants. There is no threshold level of exposure for adverse health effect determined for toxic air contaminants, and control measures may apply at ambient concentrations below any criteria levels specified for these pollutants or the general categories of pollutants to which they belong.

Under the 1990 Clean Air Act Amendments (CAAA), the USDT cannot fund, authorize, or approve national actions to support programs or projects that are not first found to conform to State Implementation Plan (SIP) for achieving the goals of the CAA requirements. Conformity with the CAA takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for CO, NO_2, ozone, and PM. California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTPs) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, a regionwide air quality model is run to determine whether or not the implementation of those projects would conform to air basin-wide emission budgets or other tests showing that attainment requirements of the CAA are met. If the conformity analysis is successful, the regional planning organization, such as Metropolitan Transportation Commission (MTC) for the San Francisco Bay Area Air Basin (SFBAAB) and the appropriate national agencies, such as the FHWA, make the determination that the RTP is in conformity with the SIP for achieving the goals of the CAA. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project level also requires “hot spot” analysis if an area is designated nonattainment or maintenance for CO and/or PM. A region is a nonattainment area if one or more monitoring stations in the region indicate that the relevant standard has been exceeded. Areas that were previously designated as nonattainment areas but have recently met the standard are called maintenance areas. Hot spot analysis is essentially the same, for technical purposes, as CO or PM analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated and, in designated nonattainment areas, the project must not cause any increase in the number and/or severity of violations. If a known CO or PM violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well. The SFBAAB has met the NAAQS for CO and PM with aerodynamic diameter less than 10 microns (PM_{10}). Therefore, the proposed project is not subject to a CO or PM_{10} hot spot analysis. However, the SFBAAB is nonattainment for the PM with aerodynamic diameter less than 2.5 microns ($PM_{2.5}$) NAAQS; therefore, a hot spot analysis is required for $PM_{2.5}$.

3.14.1.1 National

The USEPA is responsible for enforcing the national CAA and the NAAQS that it establishes. The prescribed levels (i.e., NAAQS) are considered to be the maximum concentrations of ambient (background) air pollutants determined safe (with an adequate margin of safety) to protect the public health and welfare. The CAAA were enacted to better protect the public’s health and create more efficient methods of lowering pollutant emissions. The major areas of improvement from the amendments include air basin designations, regulations addressing automobile/heavy-duty engine emissions, and rules addressing toxic air pollutants. The USEPA designates air basins as being in “attainment” or “nonattainment” levels for each of the seven criteria pollutants. The attainment status of the SFBAAB is shown in Table 3.14-3. Nonattainment air basins are ranked (marginal, moderate, serious, severe, or extreme) according to the degree of nonattainment, which dictates the length of time allocated to local air districts to achieve attainment. The air basin is then required to submit its portion of the SIP that describes how the state will achieve the NAAQS by specified dates. The extent of a given SIP depends on the severity of the air quality within the state or specific air basin. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may result in sanctions that withhold national transportation funding and stationary air pollution sources in the respective air basin.

NATIONAL HAZARDOUS AIR POLLUTANT PROGRAMS

Title III of the CAA requires USEPA to promulgate National Emissions Standards for Hazardous Air Pollutants (NESHAP) for certain categories of sources that emit one or more pollutants identified as hazardous air pollutants (HAPs), or in state parlance, toxic air contaminants (TACs). Emission standards may differ between “major sources” and “area sources” of TACs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (tpy) of any TAC or more than 25 tpy of any combination of TACs; all other sources are considered area sources. Promulgation of the emission standards involves two phases. In the first phase (1992–2000), USEPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring maximum achievable control technology (MACT). For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), USEPA is required to promulgate health risk–based emissions standards where such standards are deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA required USEPA to promulgate vehicle or fuel standards containing reasonable requirements to control TAC emissions, applying at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 of the CAA also required the use of reformulated gasoline in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions, including toxics.

3.14.1.2 State

The California Air Resources Board (ARB) is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the CCAA. The CCAA, which was adopted in 1988, required ARB to establish the CAAQS (Table 3.14-1). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing PM, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The CCAA specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Among ARB's other responsibilities are overseeing local air district compliance with California and national laws, approving local air quality plans, submitting SIPs to USEPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels. ARB is also developing plans and regulations for achieving California's greenhouse gas (GHG) reduction goals; this is discussed in greater detail in Section 4.3.8, Climate Change.

ARB and local air pollution control districts are currently developing plans for meeting new NAAQS for ozone and $PM_{2.5}$. California's adopted 2007 State Strategy was submitted to USEPA as a revision to the SIP in November 2007 (ARB 2008a).

State Toxic Air Contaminant Programs

ARB works in partnership with the local air districts to enforce regulations that reduce TACs in the state. It has authority for motor vehicles, fuels, and consumer products. ARB identifies the TACs, researches prevention or reduction methods, adopts standards for control, and enforces the standards. TACs in California are primarily regulated through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Tanner Act) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588, Hot Spot Act). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review must occur before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and adopted USEPA's list of HAPs as TACs. Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate best available control technology (BACT) to minimize emissions (e.g., ATCM that limits truck idling to 5 minutes [13 CCR Chapter 10 Section 2485]).

ARB identified diesel PM as a TAC in August 1998. Diesel PM is currently ARB's primary TAC of concern for mobile sources, in part because, of all controlled TACs, diesel PM emissions are estimated to be responsible for approximately 70% of the total ambient TAC risk (ARB 2000). In 2000, ARB developed and approved the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles and the Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines. ARB is now implementing an aggressive plan to require cleaner diesel fuel and cleaner diesel engines and vehicles and is currently developing regulations designed to reduce diesel PM emissions from diesel-fueled engines and vehicles. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions. These regulations require substantial reductions in diesel PM emissions beginning with the 2004 model year. Additional more stringent standards will apply to engines starting in the 2007 model year. Off-road vehicles will come under more stringent regulation beginning with the 2005 model year. Each of these sets of regulations will serve to significantly reduce diesel PM emissions and long-term human health risks attributable to diesel-fueled vehicles and equipment.

Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1,3-butadiene, diesel PM) have been reduced significantly over the last decade, and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75% in 2010 and 85% in 2020 from the estimated year-2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

The California State Legislature has also examined TAC hazards and has adopted several bills to control TACs. Implementation of state-adopted legislation pertaining to the control of TACs is the responsibility of ARB and local air pollution control districts. The most important legislation applicable to the proposed project is summarized below.

ARB published *Air Quality and Land Use Handbook: A Community Health Perspective*, which provides guidance concerning land use compatibility with TAC sources (ARB 2005). While not a law or adopted policy, the handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries dry cleaners, gasoline stations, and industrial facilities to help keep children and other sensitive populations out of harm's way. A number of comments on the handbook were provided to ARB by air districts, other agencies, real estate representatives, and others. The comments included concern over whether ARB was playing a role in local land use planning, the validity of relying on static air quality conditions over the next several decades in light of technological improvements, and support for providing information that can be used in local decision making.

3.14.1.3 Local

Management of air quality in the SFBAAB is the responsibility of the Bay Area Air Quality Management District (BAAQMD). The BAAQMD is responsible for bringing and/or maintaining air quality in the SFBAAB within NAAQSs and CAAQSs. Specifically, the BAAQMD has responsibility for monitoring ambient air pollutant levels throughout the SFBAAB and developing and implementing attainment strategies to ensure that future emissions will be within NAAQSs and CAAQSs. The following plans have been developed by the BAAQMD to achieve attainment of the ozone NAAQS and CAAQS. The Clean Air Plan (CAP) and Ozone Strategy fulfill the planning requirements of the CCAA, while the Ozone Attainment Plan fulfills the national CAA requirements. In addition, in December of 1999, the BAAQMD released a revision to the previously adopted CEQA Guidelines document.

AIR QUALITY PLANS

The BAAQMD prepares ozone attainment plans (OAPs) for the national ozone standard and CAPs for the California standard both in coordination with the MTC and the Association of Bay Area Governments (ABAG). These plans outline how the region will comply with its emission allowances and implement emission control strategies to achieve attainment of pollutants for which the region is nonattainment. These assumptions, along with assumptions from the RTP are used to develop the SIP. Past plans include the 2001 OAP and the 2000 CAP. The 2001 OAP is a revision to the Bay Area part of the SIP and was prepared in response to the USEPA's partial disapproval of the 1999 OAP. The 2001 OAP for the national 1-hour ozone standard includes two commitments for further planning: (1) conduct a midcourse review of progress toward attaining the national 1-hour ozone standard by December 2003; and (2) provide a revised ozone attainment strategy to USEPA by April 2004.

The 2000 CAP was adopted by the BAAQMD on December 20th, 2000, and was then submitted to ARB. The CCAA requires the BAAQMD to update the CAP for attaining the state 1-hour ozone standard every 3 years. The 2000 CAP is the third triennial update of the BAAQMD's original 1991 CAP. The 2000 CAP includes a control strategy review to ensure that the CAP includes all feasible measures to reduce ozone, updates to the emissions inventory, estimates of emission reductions, and assessments of air quality trends.

In July 2003, USEPA proposed an interim final determination that the 2001 OAP corrected the deficiencies of the 1999 Plan and proposed approval of the 2001 OAP. Following 3 years of low ozone levels (2001, 2002, and 2003), in October 2003, USEPA proposed a finding that the SFBAAB had attained the national 1-hour standard and that certain elements of the 2001 OAP (attainment demonstration, contingency measures and reasonable further progress) were no longer required. In April 2004, USEPA made final the finding that the SFBAAB had attained the 1-hour standard and approved the remaining applicable elements of the 2001 Plan: emission inventory, control measure commitments, motor vehicle emission budgets, reasonably available control measures, and commitments to further study measures. However, as part of a transition from the 1-hour ozone NAAQS to an 8-hour ozone NAAQS, the 1-hour standard was revoked on June 15, 2005, and is no longer applicable.

The 8-hour standard took effect in June 2004. In April 2004, USEPA designated regions for the new national 8-hour standard and these designations took effect on June 15, 2004. USEPA formally designated the SFBAAB as a nonattainment area for the national 8-hour ozone standard, and classified the region as “marginal” according to five classes of nonattainment areas for ozone, which range from marginal to extreme. Compliance with the standard is determined at each monitoring station using an average of the fourth highest ozone reading for 3 years. A violation at any monitoring station results in a nonattainment designation for the entire region because ozone is a regional pollutant. Monitoring data for the San Martin station for the years 2001, 2002, and 2003 show an average of the fourth highest ozone values of 86 parts per billion (one part per billion above the standard), hence the Bay Area’s “marginal” nonattainment classification. Marginal, nonattainment areas must attain the national 8-hour ozone standard by June 15, 2007.

While certain elements of Phase 1 of the 8-hour implementation rule are still undergoing legal challenge, USEPA signed Phase 2 of the 8-hour implementation rule on November 9, 2005. It is not currently anticipated that marginal areas will be required to prepare attainment demonstrations for the 8-hour standard (BAAQMD 2006).

However, there is still a need for continued improvement to meet California’s 1-hour ozone standard. Accordingly, the BAAQMD prepared the Bay Area 2005 Ozone Strategy, which is a roadmap showing how the SFBAAB will achieve compliance with the state 1-hour air quality standard for ozone as expeditiously as practicable and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The 2005 Ozone Strategy, which was adopted by BAAQMD’s Board of Directors January 4, 2006, describes how the SFBAAB will fulfill the CCAA planning requirements for the state 1-hour ozone standard and transport mitigation requirements through the proposed control strategy. The control strategy includes stationary source control measures to be implemented through BAAQMD regulations; mobile source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with MTC, local governments, transit agencies, and others. The BAAQMD will continue to adopt regulations, implement programs and work cooperatively with other agencies, organizations, and the public on a wide variety of strategies to improve air quality in the region and reduce transport to neighboring air basins.

The 2005 Ozone Strategy explains how the SFBAAB plans to achieve these goals with respect to ozone and also discusses related air quality issues of interest, including the public involvement process, climate change, $PM_{2.5}$, the BAAQMD’s Community Air Risk Evaluation (CARE) program, local benefits of ozone control measures, the environmental review process, national ozone standards, and photochemical modeling.

Overall, the 2005 Ozone Strategy is a comprehensive document that describes the SFBAAB’s strategy for compliance with state 1-hour ozone standard planning requirements and is a significant component of the region's commitment to achieving clean air to protect the public's health and the environment (BAAQMD 2006).

BAAQMD has begun preparing the 2009 CAP, which will be an update to the 2005 Ozone Strategy described above. The 2009 CAP will also evaluate the effects of control measures for ozone, PM, and greenhouse gases (GHGs) to develop a single, integrated plan. Lastly, the BAAQMD is in the process of updating the *BAAQMD CEQA Guidelines* [for] *Assessing the Air Quality Impacts of Projects and Plans* (BAAQMD Guidelines). The updated guidelines will review, revise, and develop significance thresholds, analysis methodology, and mitigation measures for criteria air pollutants, TACs, odors, and GHGs. At the time of this writing, this process (i.e., CEQA Guidelines update) is still in draft form and has not been formally adopted.

BAAQMD Rules and Regulations

The BAAQMD is responsible for limiting the amount of emissions that can be generated throughout the SFBAAB by stationary sources. Specific rules and regulations have been adopted that limit emissions that can be generated by various uses and/or activities and identify specific pollution reduction measures that must be implemented in association with various uses and activities. These rules regulate not only the emissions of the criteria air pollutants, but also the emissions of TACs. The rules are also subject to ongoing refinement by the BAAQMD.

In general, all stationary sources with air emissions are subject to BAAQMD's rules governing their operational emissions. Some emissions sources are further subject to regulation through the BAAQMD's permitting process. Through this permitting process, the BAAQMD also monitors the amount of stationary emissions being generated and uses this information in developing the CAP. The primary BAAQMD rules applicable to the project include the following:

- **Regulation 6:** Particulate Matter and Visible Emissions,
- **Regulation 7:** Odorous Substances,
- **Regulation 8, Rule 3:** Architectural Coatings, and
- **Regulation 8, Rule 15:** Emulsified Asphalt.

Local Toxic Air Contaminant Programs

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. The local air districts have the authority over stationary or industrial type sources. BAAQMD Regulation 2 permits (Permits) may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new-source-review standards and air-toxics control measures. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new-source review standards and air toxics control measures. BAAQMD limits emissions and public exposure to TACs through a number of programs and prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. It requires a comprehensive health risk assessment for facilities that are put in the significant risk category under the AB 2588 Program (Air Toxics "Hot Spot" Information and Assessment Act of 1987).

Sources that require a permit are analyzed by BAAQMD (e.g., health risk assessment [HRA]) on the basis of their potential to emit toxics. If it is determined that the project would emit toxics in excess of BAAQMD's threshold of significance for TACs (Regulation 2 Rule 5 New Source Review of Toxic Air Contaminants), sources must implement toxics best available control technology (T-BACT) to reduce emissions. If a source cannot reduce the risk below the threshold of significance, even after T-BACT has been implemented, BAAQMD will deny the permit required by the source. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs. It is important to note that BAAQMD's air quality permitting process applies to new or modified stationary sources; properties that are exposed to elevated levels of nonstationary type sources of TACs, and the nonstationary type sources themselves (e.g., on-road vehicles), are not subject to air quality permits. Further, for reasons of feasibility and practicality, mobile sources (cars, trucks, etc.) are not required to implement T-BACT, even if they do have the potential to expose adjacent properties to elevated levels of TACs. Rather, emissions controls on such sources (e.g., vehicles) are subject to regulations implemented on the national and state levels.

3.14.2 Affected Environment

The proposed project is located along the SFOBB approximately 3.7 kilometers (2.3 miles) northeast of San Francisco. The project site is located in San Francisco County, which is part of the SFBAAB. Air quality within the SFBAAB is regulated by the BAAQMD. The following section describes the existing air quality conditions on a regional and local level that influence air quality.

3.14.2.1 Topography, Meteorology, and Climate

The SFBAAB is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. Air quality within the SFBAAB is influenced by two main mountain ranges. The Sierra Nevada, with peaks reaching over 4,267.2 meters (1,400 feet), forms the eastern border of the SFBAAB. The western border is composed of the Coast Range. The gaps and directional orientation of these mountain ranges affect the location of where air flow enters and exits the SFBAAB. In the northern portion of the SFBAAB, the Coast Range splits, resulting in the western (Golden Gate) coast gap and the eastern (Carquinez Strait) coast gap. These gaps allow air to flow in and out of the SFBAAB. The Golden Gate coast gap allows marine air during afternoons and evenings to flow into the SFBAAB, which disperses and transports air pollution to neighboring counties and air basins. Winds coming from the Pacific Ocean through the Golden Gate coastal gap have typical speeds of 32.2 to 48.3 km/h (20 to 30 mph) (NOAA 1995). Air flows into Solano County through the Carquinez Strait, moving across the Sacramento–San Joaquin River Delta, and transporting pollution from the Bay Area. In the areas south of the Carquinez Strait, the Coast Ranges, which have an average elevation of 914.4 meters (3,000 feet), impede pollutants from dispersing to the east. Regional flow patterns affect air quality patterns by moving pollutants downwind of sources. Localized meteorological conditions, such as moderate winds, disperse pollutants and reduce pollutant concentrations. An inversion layer develops when a layer of warm air traps cooler air close to the ground. Such temperature inversions hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground. During summer mornings and afternoons, these inversions are present in the northeast areas of the SFBAAB. During summer's longer daylight hours, plentiful sunshine provides the energy needed to fuel photochemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_X), which result in ozone formation.

Local meteorology of the project area is represented by measurements recorded at the San Francisco Bay Area station. The region receives an average of 54.61 centimeters of precipitation per year, which primarily occurs from the months of October through April (NOAA 1995). Off-season rains (May through September) account for approximately 5% of the annual average. Maximum summer temperatures range from 15.56 to 21.11 degrees Celsius (°C). Minimum wintertime temperatures range from 7.22 to 10°C (NOAA 1995).

Climate within the SFBAAB is largely controlled by the presence of the Pacific high-pressure cell, which is located in the northern Pacific Ocean off the coast of California. During the summertime, the high-pressure cell deflects incoming storms from traveling inland. As a result, the SFBAAB receives little precipitation during these months as described above. Beginning in the fall and continuing through the winter, the high-pressure cell weakens and resides off the coast of Southern California. The absence of the high-pressure cell allows storms to travel inland and reach many portions of the SFBAAB. Temperature, winds, and rainfall become more variable during the winter months with the frequent presence of dense fog. Winter weather patterns include periods of stormy weather with rain and gusty winds.

3.14.2.2 Monitoring Station Data

To identify ambient concentrations of the criteria air pollutants, the BAAQMD operates more than 30 air quality monitoring stations throughout the SFBAAB. The nearest monitoring station to the project site is located at 10 Arkansas Street in San Francisco, approximately 6.4 kilometers (4 miles) southwest of the project site. This monitoring station measures ozone, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$. The ambient air-quality measurements from this station are representative of the air quality in the vicinity of the plan area. Table 3.14-2 summarizes the air quality data from the most recent 3 years (2006–2008).

Table 3.14-2 also lists the concentrations registered and the exceedances of CAAQS and the NAAQS that have occurred at this monitoring station from 2006 through 2008. During this period, the station did not register any days above the state 1-hour or 8-hour ozone standards. The CO and NO_2 CAAQSs were also not exceeded in any of the last 3 years. The 24-hour PM_{10} CAAQS was exceeded on multiple days in 2006 and 2007, but not once during 2008. The 24-hour $PM_{2.5}$ NAAQS was also exceeded during 2006 and 2007, but not in 2008.

3.14.2.3 Attainment Status

Both ARB and USEPA use this type of monitoring data (Table 3.14-2) to designate an area's attainment status for criteria air pollutants published by the agencies. The purpose of these designations is to identify areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are "nonattainment," "attainment," and "unclassified." The "unclassified" designation is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory

Table 3.14-2: Summary of Annual Ambient Air Quality Data[1]

	2006	2007	2008
OZONE			
Maximum concentration (1-hour/8-hour, ppm)	0.053/0.046	0.060/0.053	0.082/0.066
Number of days state standard exceeded (1-hour/8-hour)	0/0	0/0	0/0
Number of days national standard exceeded (8-hour) [2]	0	0	0
CARBON MONOXIDE (CO)			
Maximum concentration (1-hour/8-hour, ppm)	2.7/2.09	2.5/1.60	2.1/1.5 [3]
Number of days state standard exceeded (8-hour)	0	0	0
Number of days national standard exceeded (1-hour/8-hour)	0/0	0/0	0/0
NITROGEN DIOXIDE (NO_2)			
Maximum concentration (1-hour, ppm)	0.107	0.069	0.062
Number of days state standard exceeded	0	0	0
Annual average (ppm)	0.016	0.016	0.016
SULFUR DIOXIDE (SO_2)			
Maximum concentration (24-hour, ppm)	0.007	0.006	0.004
Number of days state standard exceeded	0	0	0
Number of days national standard exceeded	0	0	0
FINE PARTICULATE MATTER ($PM_{2.5}$)			
Maximum concentration (µg/m^3) (National/California [4])	54.3/54.3	45.2/45.2	29.4/39.2
Number of days national standard exceeded (measured/calculated [5]) [6]	3/3.1	5/5.1	0/—
State annual average (µg/m^3) (National/California)	**9.6/9.7**	**8.6/8.9**	**—/11.7**
RESPIRABLE PARTICULATE MATTER (PM_{10})			
Maximum concentration (µg/m^3) (National/California [4])	58.0/61.4	65.7/69.8	41.2/41.3
Number of days state standard exceeded (measured/calculated [5])	3/17.3	2/12.0	0/0.0
Number of days national standard exceeded (measured/calculated [5])	0/0.0	0/0.0	0/0.0
State annual average (µg/m^3) (National/California)	22.0/22.9	20.9/21.8	21.1/21.9

Notes: µg/m^3 = micrograms per cubic meter; ppm = parts per million; — = data not available

1 Measurements were recorded at the Arkansas Street monitoring station.

2 The 8-hour national ozone standard was revised to 0.075 ppm in March 2008. Statistics shown are based on the previous 0.08 ppm standard.

3 Both 1-hour and 8-hour CO concentrations for 2008 were obtained from USEPA because of an inconsistency between USEPA-reported 1-hour concentrations and ARB-reported 8-hour concentrations. For all other years, 8-hour CO concentrations were obtained from ARB and 1-hour CO concentrations from USEPA.

4 State and national statistics may differ for the following reasons: State statistics are based on California-approved samplers, whereas national statistics are based on samplers using national reference or equivalent methods. State and national statistics may therefore be based on different samplers. State statistics are based on local conditions while national statistics are based on standard conditions. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

4 Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

6 The national $PM_{2.5}$ 24-hour standard was revised from 65 µg/m^3 to 35 µg/m^3 in 2006. Statistics shown are based on the 65 µg/m^3 standard.

Sources: ARB 2009a; USEPA 2009a

of the nonattainment designation, called “nonattainment-transitional.” The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. The most recent attainment designations with respect to the SFBAAB are shown in Table 3.14-3 for each criteria air pollutant.

Table 3.14-3: San Francisco Bay Area Air Basin Attainment Status

Pollutant	Averaging Time	California Attainment Status	National Attainment Status
Ozone	1-hour	N	—
	8-hour	N	N
Carbon Monoxide (CO)	1-hour	A	A/M
	8-hour	A	A/M
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	—	A/M
	1-hour	A	—
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	—
	24-hour	A	A
	3-hour	—	—
	1-hour	A	—
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	N	—
	24-hour	N	U
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	N	A
	24-hour	—	N [1]
Lead	30-day Average	A	—
	Calendar Quarter	—	A

N = nonattainment; A = attainment; A/M = attainment/maintenance; U = unclassified; — = no standard

[1] On October 9, 2009, USEPA published a final ruling in the Federal Register designating the SFBAAB as nonattainment for the 2006 24-hour $PM_{2.5}$ standard. The rule will become effective 30 days after publication in the Federal Register.

Sources: ARB 2009b; USEPA 2009b

The determination of whether a region’s air quality is healthful or unhealthful is made by comparing contaminant levels in ambient air samples to national and state standards. Health-based air quality standards have been established by ARB, at the state level, and USEPA, at the national level for the following criteria air pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. These standards were established to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution. California has also established standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. The CAAQS and NAAQS for each of the monitored pollutants are presented in Table 3.14-1. The current attainment designations for the SFBAAB are summarized in Table 3.14-3.

NATIONAL ATTAINMENT STATUS

The NAAQS (other than ozone, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. The NAAQS for ozone, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The SFBAAB is currently designated as a marginal nonattainment area with respect to the national standard for ozone, a nonattainment area for the 24-hour $PM_{2.5}$ standard, and attainment or unclassified area for all other pollutants. Additional details regarding the national attainment status are provided in

Table 3.14-3. The NAAQS along with health effects, atmospheric effects, and common source types are shown in Table 3.14-1.

California Attainment Status

Air quality of a region is considered to be in attainment of the CAAQS if the measured ambient air pollutant levels for ozone, CO, NO_2, SO_2 (1- and 24-hour), PM_{10}, $PM_{2.5}$, and visibility-reducing particles are not exceeded, and all other standards are not equaled or exceeded at any time in any consecutive 3-year period. The SFBAAB is currently designated as a nonattainment area with respect to the state standards for ozone, PM_{10}, and $PM_{2.5}$ and is designated as attainment or unclassified for all other pollutants. Additional details regarding the state attainment status are provided in Table 3.14-3. The CAAQS along with health effects, atmospheric effects, and common source types are shown in Table 3.14-1.

3.14.2.4 Existing Air Quality — Criteria Air Pollutants

Criteria air pollutants can cause health risks to the public when their concentrations reach certain levels. As discussed above, the meteorology, topography, and climate of a region can influence the concentration and dispersion of air pollutants in the atmosphere. A brief description of each criteria air pollutant including source types, health effects, and future trends is provided below along with the most current attainment area designations and monitoring data for the project study area.

Ozone

Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of ROG and NO_X in the presence of sunlight. ROG are VOCs that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that results from the combustion of fuels.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 2004).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 parts per million (ppm) for 1 or 2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes, and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in the permeability of respiratory epithelia; such increased permeability leads to an increase in responsiveness of the respiratory system to challenges, and the interference or inhibition of the immune system's ability to defend against infection (Godish 2004).

Emissions of ozone precursors ROG and NO_X have decreased over the past several years as a result of more stringent motor vehicle standards and cleaner burning fuels. Consequently, peak 1-hour and 8-hour ozone indicators in the SFBAAB have declined overall by about 18% during the last 20 years (ARB 2009c). However, it is not clear if this reduction represents a significant change in the overall trend due to the variability caused by meteorological conditions in the SFBAAB (ARB 2009c).

CARBON MONOXIDE

CO, is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56% of all CO emissions nationwide. Other nonroad engines and vehicles (such as construction equipment and boats) contribute about 22% of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85% to 95% of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. The air pollution becomes trapped near the ground beneath a layer of warm air (USEPA 2008).

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (USEPA 2008).

The highest concentrations are generally associated with cold, stagnant weather conditions that occur during the winter. In contrast to problems caused by ozone, which tends to be a regional pollutant, CO problems tend to be localized.

NITROGEN DIOXIDE

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal-combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (USEPA 2008). The combined emissions of NO and NO_2 are referred to as NO_X, which are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation, during or shortly after exposure. After a period of approximately 4 to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment, with such symptoms as chronic bronchitis and decreased lung functions (USEPA 2008).

SULFUR DIOXIDE

SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 ppm or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

PARTICULATE MATTER

PM_{10} consists of PM emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources; construction operations, fires, and natural windblown dust, and PM formed in the atmosphere by condensation and/or transformation of SO_2 and ROG (USEPA 2008). $PM_{2.5}$ is another classification of PM that has been evaluated as a pollutant due to the increased health risks associated with these smaller particulates that can reach deeper into the lungs (ARB 2009c).

The adverse health effects associated with PM_{10} depend on the specific composition of the PM. For example, health effects may be associated with metals, PAH, and other toxic substances adsorbed onto fine PM (which is referred to as the “piggybacking effect”), or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death (USEPA 2008). $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health.

Direct emissions of both PM_{10} and $PM_{2.5}$ increased slightly in the SFBAAB between 1975 and 2005 and are projected to increase through 2020. These emissions are dominated by area-wide sources, primarily because of development. Direct emissions of PM from mobile and stationary sources have remained relatively steady (ARB 2009c).

LEAD

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, as discussed in detail below, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, USEPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. USEPA banned the use of leaded gasoline in highway vehicles in December 1995 (USEPA 2008).

As a result of USEPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95% between 1980 and 1999), and levels of lead in the air decreased by 94% between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13% of lead emissions. A recent National Health and Nutrition Examination Survey reported a 78% decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded gasoline (USEPA 2008).

Lead emissions and ambient lead concentrations have decreased dramatically in California over the past 25 years. The rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent ARB regulations have eliminated virtually all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for California's lead standard. (USEPA does not designate areas for the national lead standard.) Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose hot spot problems in some areas. As a result, ARB has identified lead as a TAC.

3.14.2.5 Existing Sensitive Receptors

Sensitive land uses or sensitive receptors are people or facilities that generally house people that may experience adverse effects from unhealthful concentrations of air pollutants. Commonly identified sensitive land uses are residences, schools, playgrounds, childcare centers, retirement homes or convalescent homes, hospitals, and clinics. The project site is located along the SFOBB where the bridge connects with YBI. Sensitive receptors in the project area include three residential units approximately 107 meters (351 feet) south of the project site. Commercial buildings are situated to the west and southeast of the project site; however, these uses are not considered sensitive receptors.

3.14.2.6 Existing Emission Sources

Criteria air pollutant emission sources in San Francisco County include stationary, area, and mobile sources. According to the 2006 emissions inventory (Table 3.14-4) for the county, the majority of ROG and NO_X emissions are attributable to mobile sources, while area-wide sources are the greatest contributor of PM emissions (ARB 2008b).

Table 3.14-4: Summary of 2008 Estimated Emissions Inventory for Criteria Air Pollutants and Precursors (San Francisco County)

Source Type/Category	Estimated Annual Average Emissions (Tons per Day)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Stationary Sources						
Fuel Combustion	0.18	1.75	2.67	0.09	0.30	0.30
Waste Disposal	0.03	0.00	0.00	0.00	0.00	0.00
Cleaning and Surface Coating	3.99	0.00	0.00	-	-	-
Petroleum Production and Marketing	1.43	-	0.00	-	-	-
Industrial Processes	0.73	0.00	0.01	0.00	0.35	0.21
Subtotal (Stationary Sources)	6.35	1.75	2.69	0.09	0.65	0.51
Areawide Sources						
Solvent Evaporation	8.30	-	-	-	-	-
Miscellaneous Processes	0.66	4.06	2.01	0.08	11.29	2.83
Subtotal (Areawide Sources)	8.97	4.06	2.01	0.08	11.29	2.83
Mobile Sources						
On-Road Motor Vehicles	8.74	81.27	14.95	0.07	0.69	0.47
Other Mobile Sources	9.43	60.40	59.24	14.88	3.87	3.65
Subtotal (Mobile Sources)	18.17	141.67	74.19	14.95	4.56	4.12
Total for San Francisco County	**33.49**	**147.48**	**78.89**	**15.12**	**16.50**	**7.45**

Notes: ROG = reactive organic gases; CO = carbon monoxide; NO_X = oxides of nitrogen; SO_X = oxides of sulfur; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Totals in table may not appear to add exactly due to rounding the calculations.
Source: ARB 2008b

Major stationary sources of air pollutant emissions within the county include industrial processes, fuel combustion from electric utilities and other processes, waste disposal, surface coating and cleaning, petroleum production, and other sources. Local air districts issue permits to various types of stationary sources, which must demonstrate implementation of BACT.

Area-wide sources of emissions include consumer products, application of architectural coatings, residential fuel combustion, farming operations, construction and demolition, road dust, fugitive dust, landscaping, fires, and other miscellaneous sources. Paved road dust is the largest contributor to PM emissions within the county.

On-road and other mobile sources are the largest contributors of ozone precursor emissions within the county. On-road sources consist of passenger vehicles, trucks, buses, and motorcycles, while off-road vehicles and other mobile sources comprise heavy-duty equipment, boats, aircraft, trains, recreational vehicles, and farm equipment. Major roadways in San Francisco County include I-80 and I-280. Major U.S. routes include U.S. Highway 101 and major state routes include SR-1.

SAN FRANCISCO COUNTY EMISSIONS INVENTORY

Table 3.14-4 summarizes emissions of criteria air pollutants within San Francisco County for various source categories. According to San Francisco County's emissions inventory, mobile sources are the largest contributor to the estimated annual average air pollutant levels of ROG, CO, NO_X, and oxides of sulfur (SO_X) accounting for approximately 54%, 96%, 94%, and 99%, respectively, of the total emissions. Area-wide sources account for approximately 68% and 38% of the County's PM_{10} and $PM_{2.5}$ emissions, respectively.

3.14.3 Environmental Consequences

3.14.3.1 Temporary Impacts

Temporary or short-term impacts to air quality associated with implementation of the proposed project include construction-related emissions of criteria air pollutants and precursors. This analysis of the project's construction-related emissions is consistent with the recommendations of the BAAQMD Guidelines. BAAQMD's recommended approach to evaluating construction-related impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions. The analysis of air quality impacts is based on air quality regulations administered by the USEPA, FHWA, ARB, and the BAAQMD. The *Yerba Buena Island Ramps Improvement Project Air Quality Analysis* (Appendix L) includes mitigation measures for construction activities that would reduce the generation of fugitive PM_{10} dust and mobile source exhaust emissions. These measures would require implementing air pollution and dust control methods specified in the Caltrans' Standard Specifications Section 14-9.01, "Air Pollution Control" by complying with applicable air pollution control rules, regulations, ordinances, and statutes; and Section 14-9.02, "Dust Control" by applying water and/or dust palliative to reduce dust. These measures would include:

- Water or dust palliative will be applied to the site and equipment as frequently as necessary to control fugitive dust emissions.

- Soil binder will be spread on any unpaved roads used for construction purposes, and all project construction parking areas.

- Trucks will be washed off as they leave the right of way as necessary to control fugitive dust emissions.

- Construction equipment and vehicles shall be properly tuned and maintained. Low-sulfer fuel shall be used in all construction equipment as provided in California Code of Regulations Title 17, Section 93114.

- Develop a dust control plan documenting sprinkling, temporary paving, speed limits, and expedited revegetation of disturbed sloped as needed to minimize construction impacts to existing communities.

- Locate equipment and materials storage sites as far away from residential and park uses as practical. Keep construction areas clean and orderly.

- To the extent feasible, establish environmental site assessments (ESA) for sensitive air receptors within which construction activities involving extended idling of diesel equipment would be prohibited.
- Use track-out reduction measures such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic.
- Cover all transported loads of soils and wet materials prior to transport, or provide adequate freeboard (space from the top of the material to the top of the truck) to reduce PM_{10} and deposition of particulate during transportation.
- Remove dust and mud that are deposited on paved, public roads due to construction activity and traffic to decrease particulate matter.
- To the extent feasible, route and schedule construction traffic to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.
- Install mulch or plant vegetation on disturbed areas as soon as practical after grading to reduce windblown particulate in the area.

NO BUILD ALTERNATIVE

Under the No Build Alternative, the existing ramps would stay intact and no construction activities or associated emissions would occur.

ALTERNATIVE 2B

Under Alternative 2b, construction activities are anticipated to last approximately 2 years. Demolition activities would include removal of the existing westbound on- and off-ramps on the east side of YBI. A proposed westbound loop on-ramp would be constructed from Macalla Road along the east side of YBI. The proposed westbound off-ramp would lead to Macalla Road on the east side of YBI. Alternative 2b would also include the relocation of Quarters 10/Building 267. Although these activities would be anticipated to generate additional construction-related emissions, the annual emissions associated with Alternative 2b would be comparable to those of the other build alternative (Alternative 4). Therefore, the construction-related impacts associated with the build alternatives (i.e., Alternative 2b and Alternative 4) are discussed together below, under Build Alternatives.

ALTERNATIVE 4

Under Alternative 4, construction activities would also last approximately 2 years. Both of the existing westbound on- and off-ramps would be demolished and removed as part of this alternative. The proposed on-ramp would originate from South Gate Road rather than Macalla Road. The proposed off-ramp would still lead to Macalla Road on the east side of YBI. The proposed westbound on-ramp for Alternative 4 would be approximately three times longer than the on-ramp proposed for Alternative 2b. Therefore, it is anticipated that construction of the westbound on-ramp under Alternative 4 would generate more emissions relative to Alternative 2b. However, Alternative 4 would not relocate Quarters 10/Building 267. Therefore, it is anticipated that construction-related emissions associated with Alternative 4 would be comparable to those of Alternative 2b on an annual basis. The construction-related impacts associated with the build alternatives (Alternative 2b and Alternative 4) are discussed together below, under Build Alternatives.

BUILD ALTERNATIVES

Under the two build alternatives, construction activities would generate emissions of criteria air pollutants and precursors from various sources. The proposed build alternatives would require demolition of existing ramp structures, site grading, construction of the proposed ramps, and asphalt paving for the new roadway surfaces. Demolition and grading activities that include disturbance of existing ramp structures or exposed soil would generate fugitive PM_{10} dust emissions. Heavy-duty off-road construction equipment used for demolition, grading, construction, and asphalt paving would generate exhaust emissions of criteria air pollutants and precursors. Additional exhaust emissions would be generated from material delivery trucks, construction worker vehicles, and, if needed, on-site generators. In addition, the application of asphalt for roads and, if required, the architectural coatings for structures would generate off-gas emissions of ROG.

Daily construction-related emissions would vary depending on the type and level of construction activities. However, construction-related emissions would be temporary and finite in nature. All construction-related emissions associated with the proposed project would cease following completion of the project. BAAQMD recommends that projects implement the most effective and comprehensive control measures available to minimize construction emissions. Implementation of the control measures would reduce any construction-related impact to a less-than-significant level. The abatement measures listed in the *Yerba Buena Island Ramps Improvement Project Air Quality Analysis* (Appendix L) and minimization measures listed in Section 3.14.5 below are required to be implemented during construction of the proposed project and would reduce the project's temporary impacts to a less-than-significant level. These measures would require implementing air pollution and dust control methods specified in the Caltrans' Standard Specifications Section 14-9.01, "Air Pollution Control" by complying with applicable air pollution control rules, regulations, ordinances, and statutes; and Section 14-9.02, "Dust Control" by applying water and/or dust palliative to reduce dust. Other measures include watering the site, developing a dust control plan, keeping construction areas clean and orderly, prohibiting extended idling of diesel equipment for sensitive air receptors, use track-out reduction measures to minimize dust and mud deposits on roads affected by construction traffic, covering all transported loads, remove dust and mud that are deposited on roads due to construction activity, and installing mulch or plant vegetation on disturbed areas as soon as practical after grading.

TOXIC AIR CONTAMINANTS

During construction of the proposed project, heavy-duty diesel construction equipment would generate diesel PM exhaust emissions, which have been classified by ARB as a TAC. Although intermittent and temporary, sensitive receptors in the project vicinity would be exposed to emissions of diesel PM during construction of the proposed project. A temporary increase in air emissions is defined as an increase that would only occur during a construction phase and would last for 5 years or less at any individual site.

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment, the HRA, which determines the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the proposed project (Salinas 2004). Thus, because the use of off-road heavy-duty diesel equipment would be temporary in combination with the highly dispersive properties of diesel PM (Zhu et al. 2002) and further reductions in exhaust emissions from regulatory programs and requirements (e.g., Clean Air Nonroad Diesel Rule and ARB tier standards), project-generated, construction-related emissions of TACs would not expose sensitive receptors to substantial emissions of TACs. As a result, this impact would not be adverse.

ASBESTOS

According to *A General Location Guide for Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos* (CDC 2000), the project site is not located in an area that is likely to contain naturally occurring asbestos. Thus, hazardous exposure to asbestos-containing serpentine materials would not be a concern with the proposed project.

Certain building structures (on YBI) and the on- and off-ramp structures could potentially include ACM that would be disturbed and emitted into the atmosphere during construction of the proposed project. However, as discussed in Chapter 13, Hazardous Waste/Materials, the 2008 Site Management Plan has abated all known ACM on the YBI and TI areas, including Quarters 10/Building 267, which would be relocated as part of Alternative 2b. Therefore, the proposed project would not expose any receptors or workers to naturally occurring or structural asbestos.

ODORS

Construction of the new ramps may generate odors associated with exhaust emissions from heavy-duty diesel construction equipment; however, these sources would be intermittent and temporary in nature. Construction of either alternative is expected to last less than 2 years, which is considered a temporary increase in air pollutant emissions. Therefore, temporary construction activities are not anticipated to cause a significant source of odiferous compounds.

3.14.3.2 Permanent Impacts

ALTERNATIVE ANALYSIS

Evaluation of the proposed project's permanent impacts includes analysis of the long-term operational changes on a regional and local level associated with implementation of the proposed project. While the proposed project would not result in increased vehicle trips or vehicle miles traveled (VMT) it would affect traffic parameters along the YBI on- and off-ramps, SFOBB, and local roadways on YBI, including average vehicle speeds, traffic volumes, and vehicle queuing. The change in traffic patterns would affect regional mobile-source emissions. As a nonattainment area for the ozone NAAQS, the transportation infrastructure-related projects within the SFBAAB must be consistent with the MTC's most recently adopted Regional Transportation Plan and Regional Transportation Improvement Program (RTIP) to avoid contributing to the existing nonattainment status of the SFBAAB.

On a local level, the proposed project could contribute to hot spots of CO, PM_{10}, or $PM_{2.5}$. A hot spot occurs when pollutant concentrations exceed the NAAQS or CAAQS. In addition, the potential for the proposed project to cause a substantial increase in mobile-source air toxics (MSATs) should also be evaluated on a local level. An analysis was conducted to evaluate the potential for a CO, PM_{10}, or $PM_{2.5}$ hot spot or substantial increase in MSATs as a result of the proposed project.

The discussion below summarizes the impacts associated with the proposed alternatives. Due to the similar operational scenarios associated with the build alternatives (i.e., Alternatives 2b and 4), these alternatives are discussed together below.

NO BUILD ALTERNATIVE

Under the No Build Alternative, future overall operations of the ramp junction would decrease. Due to the insufficient capacity of the existing ramps, long delays and queues would be anticipated on YBI in future conditions (year 2035). The level of service (LOS) and average vehicle speeds at the ramp junction would decline compared to existing conditions. The proposed project is included in the Transportation 2035 Plan (2035 RTP) (latest RTP update) and the 2009 Transportation Improvement Plan (2009 TIP) (latest RTIP update), which are used to demonstrate the region's transportation-related efforts to achieve attainment of NAAQS (see Appendix L for excerpts of the RTP and TIP referencing the project). Therefore, without implementation of the proposed project (i.e., No Build Alternative), the project would not be consistent with the assumptions used in MTC's regional emissions analysis and could conflict with regional air quality plans and, therefore, conflict the region from meeting its attainment goals.

ALTERNATIVES 2B AND 4

The two build alternatives would remove the existing on- and off-ramps and construct new ramps that meet seismic requirements, highway design standards, and improve safety. Both alternatives would add capacity to the on-ramp to handle the increase in future traffic volumes. The permanent impacts associated with the build alternatives are discussed in further detail below.

3.14.3.3 Regional Air Quality

A project's regional air quality impacts would be significant if the proposed project is not included in the most recent RTP and RTIP. As discussed in the *Yerba Buena Island Ramps Improvement Project Air Quality Analysis* (Appendix L), the proposed project is included in the 2035 RTP, which was found to meet the transportation conformity provisions of the national CAA by MTC on April 22, 2009. The project is also included in MTC's financially constrained 2009 TIP, which was found to conform to the CAA requirements by FHWA and FTA on November 17, 2008. Therefore, the proposed project would meet the requirements for regional air quality conformity and the change in emissions associated with the proposed project would have been accounted for the in the regional SIP.

3.14.3.4 Local Air Quality

CARBON MONOXIDE HOT SPOTS

A qualitative analysis for a potential CO hot spot as a result of the proposed project was performed using the *Transportation Project-Level Carbon Monoxide Protocol* (ITS 1997). The analysis determined that the proposed project would not generate additional vehicle trips that would increase CO concentrations at local intersections. Although implementation of the proposed metering at the westbound on-ramp would result in an increase of vehicles idling, the number of vehicles at the on-ramp would not be expected to cause an exceedance of any ambient air quality standard. In addition, sensitive receptors would not be located near the on-ramp. Therefore, the proposed project would not generate CO concentrations that would exceed or contribute to an exceedance of the NAAQS or CAAQS at local intersections. Please refer to the *Yerba Buena Island Ramps Improvement Project Air Quality Analysis* in Appendix L for full detail of the analysis.

$PM_{2.5}$ AND PM_{10} HOT SPOTS

On March 10, 2006, USEPA published a final rule that established the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas. Based on that rule, USEPA and FHWA published a guidance document, *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (PM Guidance) (FHWA 2006a).

The PM Guidance document describes qualitative hot spot analyses. As part of the final rule, a $PM_{2.5}$ and PM_{10} hot spot analyses is required for projects of air quality concern (POAQCs) that are located in a national PM_{10} or $PM_{2.5}$ nonattainment area. The proposed project is located in a national PM_{10} attainment area and a national 24-hour $PM_{2.5}$ nonattainment area; therefore, to meet state requirements, the proposed project is assessed using the procedure outlined in the PM Guidance.

A hot spot analysis is defined in 40 C.F.R. 93.101 as an estimation of likely future localized $PM_{2.5}$ or PM_{10} pollutant concentrations and a comparison of those concentrations to the relevant air quality standards. A hot spot analysis assesses the air quality impacts on a scale smaller than an entire nonattainment or maintenance area, including, for example, congested roadway intersections and highways or transit terminals. Such an analysis is a means of demonstrating that a transportation project meets CAA conformity requirements to support state and local air quality goals with respect to potential localized air quality impacts. When a hot spot analysis is required, it is included within the project-level conformity determination that is made by FHWA or the Federal Transit Administration (FTA).

The PM Guidance document describes qualitative hot spot analysis method that does not involve dispersion modeling. This qualitative $PM_{2.5}$ and PM_{10} hot spot analysis method involves a more streamlined review of local factors such as local monitoring data near a proposed project location. Quantitative $PM_{2.5}$ and PM_{10} hot spot analyses will be required when appropriate methods and modeling guidance are available.

To meet statutory requirements, the March 10, 2006, final rule requires $PM_{2.5}$ and PM_{10} hot spot analyses to be performed for POAQCs. Qualitative hot spot analyses would be done for these projects. Projects not identified as POAQCs are considered to have met statutory requirements without any further hot spot analyses.

The PM Guidance defines POAQCs as projects within a Federally designated $PM_{2.5}$ or PM_{10} nonattainment or maintenance area that are funded or approved by FHWA or FTA, and are one of the following types of projects:

- New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;

- Projects affecting intersections that are LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F, because of increased traffic volumes from a significant number of diesel vehicles related to the project;

- New bus and rail terminals, and transfer points, that have a significant number of diesel vehicles congregating at a single location;

- Expanded bus and rail terminals, and transfer points, that significantly increase the number of diesel vehicles congregating at a single location; and

- Projects in, or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The PM Guidance contains examples of POAQCs and examples of projects that are not an air quality concern. Under the example of POAQC, a significant volume for a new highway or expressway is defined as facilities with an annual average daily traffic (AADT) volume of 125,000 or more, and a significant number of diesel vehicles is defined as 8% or more of the total AADT or more than 10,000 truck AADT. A significant increase in diesel truck traffic is normally considered to be approximately 10%.

The proposed project would replace the YBI on- and off-ramps, which do not have and are not expected to have an AADT over 125,000 during current and future conditions. In addition, the proposed project would not increase the percentage of diesel truck traffic traveling along the ramps. The project would also not involve any bus or rail terminals, and transfer points. Therefore, the project is would not be considered a POAQC. Concurrence with this determination must be obtained from all Federal, state, and local agencies with an air quality regulatory responsibility.

The proposed project is located in an attainment area for the PM_{10} and nonattainment area for the 24-hour $PM_{2.5}$ NAAQS, and in a nonattainment area for the PM_{10} and $PM_{2.5}$ CAAQSs. Based on screening using USEPA PM Guidance, the proposed project is not a POAQC because it does not meet the criteria described above. The proposed project is therefore in conformance for the PM_{10} and $PM_{2.5}$ NAAQS and is unlikely to increase the frequency or severity of any existing exceedances regarding the nonattainment of state PM_{10} and $PM_{2.5}$ standards.

MOBILE-SOURCE AIR TOXICS

In addition to CO and PM, MSAT emissions are of local concern. MSATs are compounds emitted from highway vehicles and nonroad equipment. In February 2006, FHWA issued the FHWA Interim Guidance to advise when and how to analyze MSATs in the NEPA process for highways. However, USEPA currently recommends following the March 2007 report entitled “Analyzing, Documenting, and Communicating the Impacts of Mobile Source Air Toxic Emissions in the NEPA Process.” FHWA and USEPA are currently undergoing mediation on the FHWA Interim Guidance. In September 2009, FHWA released an update to the FHWA Interim Guidance (i.e., Interim Guidance Update). The Interim Guidance Update did not change any project analysis thresholds, recommendations, or guidelines; however, an updated set of seven priority MSATs were identified as having significant contributions from mobile sources that are among the national- and regional-scale cancer risk drivers.

Evaluating the environmental and health impacts from MSATs on a proposed highway project may involve several key elements, including emissions modeling, dispersion modeling to estimate ambient concentrations resulting from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure.

The following is an excerpt from Appendix C of the FHWA Interim Guidance (FHWA 2006b):

INTRODUCTION TO MSATS

> In addition to the criteria air pollutants for which there are NAAQS, USEPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, nonroad mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).
>
> MSATs are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.
>
> USEPA is the lead Federal Agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. USEPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the CAA. In its rule, USEPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs would reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57–65 percent, and would reduce on-highway diesel PM emissions by 87 percent.

As a result, USEPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impact Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. Environmental Protection Agency (USEPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the CAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSATs. The USEPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (USEPA, http://www.epa.gov/ncea/iris/index.html). Each report contains assessments of noncancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSATs, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/ view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts—each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the USEPA's MOBILE6.2 model, the Cal/EPA's Emfac2007 model, and USEPA's DraftMOVES2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel particulate matter (PM) emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of USEPA's guideline CAL3QHC model was conducted in an NCHRP study (http://www.epa.gov/scram001/ dispersion_alt.htm#hyroad), which documents poor model performance at 10 sites across the country—three where intensive monitoring was conducted plus an additional seven with less intensive monitoring. The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with NAAQS for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSATs because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The USEPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs. healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the USEPA as provided by the CAA to determine whether more stringent controls are required to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires USEPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld USEPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of USEPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The USEPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The USEPA IRIS is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from USEPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures, unless noted otherwise.

- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

- **Diesel PM exhaust** is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

- **Diesel exhaust** also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

- **Naphthalene** is classified in Group C, a possible human carcinogen. This is based on the inadequate data of carcinogenicity in humans exposed to naphthalene via the oral and inhalation routes, and the limited evidence of carcinogenicity in animals via the inhalation route.

- Epidemiological studies have shown an increase in lung cancer cases for individuals exposed to **polycyclic organic matter** sources such as coke oven emissions, roof tar emissions, and cigarette smoke. Seven polycyclic organic matter compounds have been classified as Group B2, probable human carcinogens (USEPA 2009d).

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a nonprofit organization funded by USEPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT “hot spots,” the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes—particularly respiratory problems (South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA’s Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein).

Much of this research is not specific to MSATs but instead surveys the full spectrum of both criteria air and other pollutants.

This document provides a qualitative assessment of MSAT emissions relative to the various alternatives and has acknowledged that all the project alternatives may result in increased exposure to MSAT emissions in certain locations.

It is possible to qualitatively assess the levels of future MSAT emissions under the project. A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives* (FHWA 2009c),

EVALUATION OF PROJECT MSAT POTENTIAL

The FHWA has developed a tiered approach (FHWA Interim Guidance and Interim Guidance Update) for analyzing MSATs in NEPA documents. This tiered approach has not been altered in the Interim Guidance Update. Depending on the specific project circumstances, FHWA has identified three levels of analysis:

- Category 1: No analysis for projects with no potential for meaningful MSAT effects,
- Category 2: Qualitative analysis for projects with low potential MSAT effects, or
- Category 3: Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

Category 1 is limited to projects that qualify as a categorical exclusion under 23 C.F.R. 771.117(c); are exempt under the CAA conformity rule under 40 C.F.R. 93.126; or have no meaningful impacts on traffic volumes or vehicle mix. The proposed project does not meet any of the Category 1 requirements.

For a project to be of the magnitude to have a higher potential for MSAT effects, Category 3, a project must:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location; or
- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000, or greater, by the design year; and
- Be proposed to be located in proximity to populated areas or in rural areas, in proximity to concentrations of vulnerable populations (i.e., schools, nursing homes, hospitals).

The proposed project would not alter a major intermodal freight facility or add significant capacity to urban highways where AADT is projected to be above 140,000. Therefore, by default, the proposed project would be classified as a Category 2 project with low potential MSAT effects. A Category 2 MSAT analysis is recommended for projects that would improve operations of highway, transit or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase emissions. A qualitative MSAT analysis should be performed for Category 2 projects discussing the expected effect of the project on traffic volumes, vehicle mix, or routing of traffic. The analysis should also qualitatively evaluate the change in MSAT emissions based on the expected effect of the project on VMT, vehicle mix, and vehicle speeds.

PROJECT-SPECIFIC MSAT IMPACT ANALYSIS

The amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. In addition, the FHWA's *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives* study concluded that the most important factors affecting MSAT emissions are VMT and levels of traffic congestion (FHWA 2009c). A higher level of traffic congestion and reduced vehicle speeds were found to increase emission factors of all seven priority MSATs except for diesel PM. The emission rate for diesel PM is not as dependent on speeds as the other MSATs. Based on a review of the traffic study, year 2035 (i.e., build-out year) traffic volumes and associated VMT estimated for the two build alternatives and the No Build Alternative would be similar. The reason being, although the project would add additional capacity, the project itself would not generate trips or attract new trips as a result of its completion. In addition, the proposed project would not develop a land use that would alter the vehicle mix traveling along the ramps. Therefore, MSAT emissions associated with each alternative would vary as a function of vehicle congestion along the on- and off-ramps. The traffic study determined that compared with the No Build Alternative, the average operating speed on the on-ramp would be lower for the Build condition due to the proposed metering system (i.e., one-to-one ratio of vehicles exiting and entering the SFOBB). Under the No Build Alternative (i.e., no metering), the average vehicle speed on the on-ramp would be slightly higher due to the lack of metering. However, it should be noted that the free-flowing and unmetered on-ramp under the No Build Alternative could cause congestion and reduced speeds on the SFOBB. The operating speeds on the SFOBB were not analyzed in the traffic study. With respect to the operation of the on-ramp, the two build alternatives would result in more delays and queuing as a result of the proposed metering for the on-ramp, and therefore a lower average operating speed. According the *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives* study, it is anticipated that the build alternatives would result in higher emissions of MSATs than the No Build Alternative.

Regardless of the alternative chosen, emissions would likely be lower than present levels in the design year as a result of USEPA's national control programs that are projected to reduce MSAT emissions by 57–87 percent between 2000 and 2020 (FHWA 2006b). This reduction in MSAT emissions is projected to occur even with a 64-percent increase in VMT. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

3.14.3.5 Other Permanent Impacts

ODORS

The proposed project does not include any land uses that would generate offensive odors. In addition, the new ramps would not encourage heavy-duty diesel truck traffic that could potentially be a permanent source of odors. Therefore, it is not anticipated that the proposed project would generate or cause an increase in odiferous compounds in the project area.

3.14.4 Climate Change

Climate change is analyzed in Chapter 4. Neither USEPA nor FHWA has promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will facilitate decision making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders regarding climate change, the issue is addressed in Chapter 4 of this environmental document and may be used to inform the NEPA decision. The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours travelled.

3.14.5 Avoidance, Minimization, and/or Mitigation Measures

Under the No Build Alternative, no construction activities would occur and current traffic operations would continue. Therefore, the avoidance, minimization, and/or mitigation measures described below apply to the construction activities that would be associated with the two build alternatives. These measures are recommended by the BAAQMD to minimize the generation of fugitive PM_{10} dust emissions. The contractor would be required to implement these “Basic Control Measures” during all construction activities. The abatement measures listed in the *Yerba Buena Island Ramps Improvement Project Air Quality Analysis* (Appendix L) are also required to be implemented during construction activities. In addition, the project site is approximately 1.62 hectares (4 acres); therefore, according to the BAAQMD CEQA Guidelines, the contractor is required to implement the BAAQMD’s “Enhanced Control Measures.”

The following “Basic Control Measures” are required for all construction activities:

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 61 centimeters (24 inches) of freeboard.
- Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

These additional “Enhanced Control Measures” should be implemented if the project site would exceed 1.62 hectares (4 acres):

- Include all “Basic” control measures listed above.
- Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).

- Enclose, cover, water twice daily, or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.)

- Limit traffic speeds on unpaved roads to 24 kilometers (14.9 miles) per hour.

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

- Replant vegetation in disturbed areas as quickly as possible.

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3.15 Noise

3.15.1 Regulatory Setting

NEPA and CEQA provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

3.15.1.1 California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible. The rest of this section will focus on the NEPA-23 C.F.R. 772 noise analysis; please see Chapter 4 of this document for further information on noise analysis under CEQA.

3.15.1.2 National Environmental Policy Act and 23 C.F.R. 772

For highway transportation projects with FHWA (and Caltrans, as assigned) involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 C.F.R. 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain noise abatement criteria (NAC) (Table 3.15-1) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 A-weighted decibels [dBA]) is lower than the NAC for commercial areas (72 dBA). The following table lists the NAC criteria for use in the NEPA and 23 C.F.R. 772 analysis.

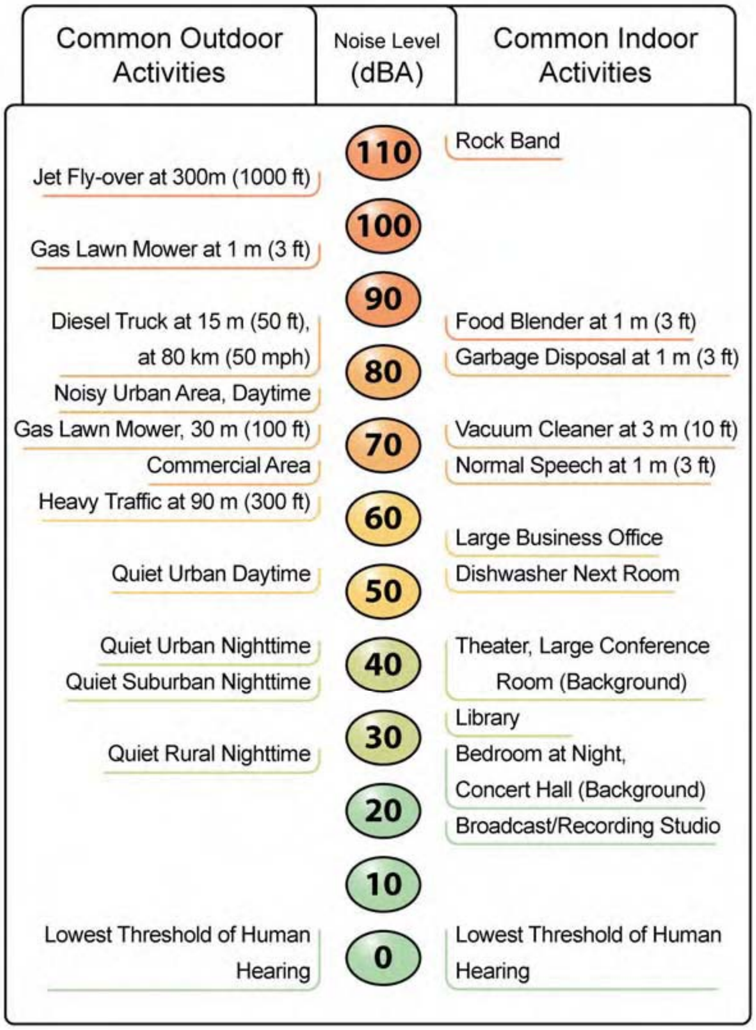
Table 3.15-1: FHWA Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level (dBA L_{eq})	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above
D	–	Undeveloped lands
E	52 Interior	Residence, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Source: 23 C.F.R. 772

Table 3.15-2 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise-levels discussed in this section with common activities.

Table 3.15-2: Noise Levels for Common Activities



Source: Caltrans 2008a

In accordance with Caltrans' *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects* (Caltrans 2006), a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

Caltrans' Traffic Noise Analysis Protocol (Caltrans 2006) sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5-dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible.

Other considerations include topography, access requirements, other noise sources, and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include residents' acceptance, the absolute noise level, build versus existing noise, environmental impacts of abatement, public and local agencies input, newly constructed development versus development predating 1978, and the cost per benefited residence.

VIBRATION

Ground-borne vibration can be a source of annoyance to people or a source of structural damage to some types of buildings. Although vibration measurements can be presented in many different forms, peak particle velocity (PPV) is the unit of measure used most often to assess building damage potential. The Caltrans has identified vibration impact criteria for both building damage potential and human annoyance. Both human annoyance effects and building damage effects depend in part on whether vibration events are isolated, discrete events or a relatively continuous episode of vibrations. In general, there is less sensitivity to single, discrete events than to continuous events or frequently repeated discrete events. Table 3.15-3 below summarizes Caltrans criteria for assessing the effects of ground-borne vibration.

3.15.2 Affected Environment

In January 2011, a Noise Study Report (NSR) was prepared for this project and is incorporated by reference (Yerba Buena Ramps Improvement Project, Final Noise Study Report. January, 2011a) and also included as Appendix M. The noise receivers analyzed in this study are located along both sides of I-80 and the SFOBB within the project area (see Table 3.15-10). A map displaying the location of the noise receivers analyzed in this study is included in Figure 3.15-1.

YBI is surrounded by San Francisco Bay waters; the San Francisco mainland is about 3.7 kilometers (2.3 miles) to the west and Oakland is about 3.2 kilometers (2 miles) to the east. YBI is a natural island that has been used by private parties and the U.S. Army, USCG, and U.S. Navy since the 1840s; the island is steeply sloped and highly vegetated. USCG Sector San Francisco occupies 19.39 hectares (47.9 acres) of land on the southeast side of YBI, and Caltrans occupies about 8.1 hectares (20 acres) of YBI with portions of the SFOBB and tunnel.

Adjacent land uses include residential units, a limited amount of commercial development, and a USCG station intermixed with undeveloped hillsides. The USCG station incorporates a separate area within the facility that has varying land uses, including residential, commercial, office, and industrial. Commercial development is scattered to the north of the project area. Additional residential, commercial, and industrial development can be found west of YBI on TI.

Land uses on the eastern side of YBI in the vicinity of the proposed project include Quarters 1–7. Quarters 1–7 were built in the early 1900s as officers' quarters and comprise a Historic District. Quarters 1–7 have been renovated and are leased out by the City and County as locations for events and meetings. Two other buildings (Buildings

Table 3.15-3: Summary of Caltrans Vibration Criteria

Type of Criteria	Threshold Condition	Peak Particle Velocity (PPV), centimeters/second (inches/second)	
		Transient Sources	Continuous or Frequent Sources
Human Response	Barely perceptible	0.10 (0.04)	0.03 (0.01)
	Distinctly perceptible	0.64 (0.25)	0.10 (0.04)
	Strongly perceptible; may be annoying to some people in buildings	2.29 (0.9)	0.25 (0.10)
	Severe; unpleasant for people in buildings; unacceptable to pedestrians on bridges	5.08 (2.0)	1.02 (0.4)
Building Damage	Cosmetic damage threshold for extremely fragile historic buildings, ruins, and ancient monuments	0.30 (0.12)	0.20 (0.08)
	Cosmetic damage threshold for fragile buildings	0.51 (0.2)	0.25 (0.1)
	Cosmetic damage threshold for historic and some old buildings	1.27 (0.5)	0.64 (0.25)
	Cosmetic damage threshold for older residential structures	1.27 (0.5)	0.76 (0.3)
	Cosmetic damage threshold for newer residential structures	2.54 (1.0)	1.27 (0.5)
	Cosmetic damage threshold for modern industrial/commercial buildings	5.08 (2.0)	1.27 (0.5)

Source: Caltrans 2002 (Technical Advisory, Transportation Related Earthborne Vibrations).

213 and 262) are located on the eastern side of YBI. Building 213 is currently vacant; however, a fire truck owned by the City and County of San Francisco is stored inside. Building 262, known as the Torpedo Building, was constructed in 1891 and is eligible for the NRHP.

USCG Sector San Francisco is an active military installation and occupies 19.39 hectares (47.9 acres) of land on the southeast side of YBI. It includes administrative, training, operation, and maintenance spaces and a few single family residential homes in addition to dock space. Station San Francisco is collocated with the larger Sector San Francisco.

3.15.2.1 Noise Receivers

The noise receivers analyzed in the project area are located along both the east and west sides of I-80 SFOBB and the proposed locations for the ramp improvements, as shown in Figures 3.15-2 and 3.15-3. The majority of Category B land uses in the project area are residential, single-family, and multiple-family. This analysis includes 17 receivers that represent four single-family residential units, 20 multiple-family residential units, 11 commercial/governmental units, one recreational area, and one driveway.

The single-family residential units for which noise levels were assessed are located east of the YBI SFOBB stretch, along Hillcrest Road. Single-family residential units located in the USCG station and serving as the officers quarters are represented by R-11, R-14, and R-15, which are located along the eastern side of Hillcrest Road. R-11, R-14, and R-15 are known as Quarters 9 and Quarters A and B, respectively. R-12, located in the driveway nearest the project site, was used as a model calibration point. R-13 is located between Quarters A and B and represents a recreational area.

R-3 and R-6 through R-9 represent 20 multiple-family residential units in the project area (Figure 3.15-1). R-3 represents an abandoned barrack. R-6 through R-9 represent USCG quarters.

Category C receivers evaluated in the impact assessment are commercial/governmental development and are represented by R-1, R-2, R-4, R-5, R-10, R-16, and R-17 (Figure 3.15-1). R-1, R-2, and R-17 represent event rental facilities. R-16 represents a noncommercial land use: the USCG Vessel Traffic Service complex parking lot. R-4, R-5, and R-10 represent nonresidential uses, offices, and parade grounds, at the USCG station. R-1, R-2, R-4, R-5, and R-10 have direct lines of sight to the proposed ramp improvement project location and the YBI SFOBB stretch.

Existing Noise Level Measurements

Site visits and noise measurements were conducted on March 30, and April 1 and 6, 2009 (see Appendix M for details). For each measurement location, the sound level meter was placed 1.5 meters (4.9 feet) above the existing ground elevation. The 24-hour long-term (LT) measurements are summarized in Tables 3.15-4 through 3.15-8.

Measurement data for LT-1, Table 3.15-4, indicate that the loudest periods of the day occur during the 6:00 a.m. hour. Table 3.15-4 also indicates noise levels are consistent for most of the day as they do not fluctuate by more than 1 dBA between 4:00 a.m. and 10:00 p.m.

Measurement data for LT-2, Table 3.15-5, indicate that the loudest periods of the day occur during the 7:00 a.m. hour. Table 3.15-5 also indicates daytime noise levels are relatively consistent as they do not fluctuate by more than 2 dBA between 6:00 a.m. and 8:00 p.m.

Measurement data for LT-3, Table 3.15-6, indicate that the loudest periods of the day occur during the 7:00 a.m. hour. Table 3.15-6 also indicates noise levels are consistent between 6:00 a.m. and 6:00 p.m. as noise levels do not fluctuate by more than 1 dBA during this period.

Table 3.15-4: Summary of LT-1
March 30, 2009

Time	L_{eq}	Time	L_{eq}
12:00 a.m.	65.3	12:00 p.m.	71.1
01:00 a.m.	60.9	13:00 p.m.	71.2
02:00 a.m.	61.5	14:00 p.m.	70.4
03:00 a.m.	65.2	15:00 p.m.	70.0
04:00 a.m.	70.3	16:00 p.m.	69.7
05:00 a.m.	71.3	17:00 p.m.	69.6
06:00 a.m.	**71.4**	18:00 p.m.	71.0
07:00 a.m.	71.1	19:00 p.m.	71.2
08:00 a.m.	70.3	20:00 p.m.	71.0
09:00 a.m.	71.3	21:00 p.m.	70.4
10:00 a.m.	71.2	22:00 p.m.	68.8
11:00 a.m.	70.9	23:00 p.m.	67.3

Source: Yerba Buena Ramps Improvement Project, Final Noise Study Report. January 2011a
Bolded numbers indicate the loudest hour.

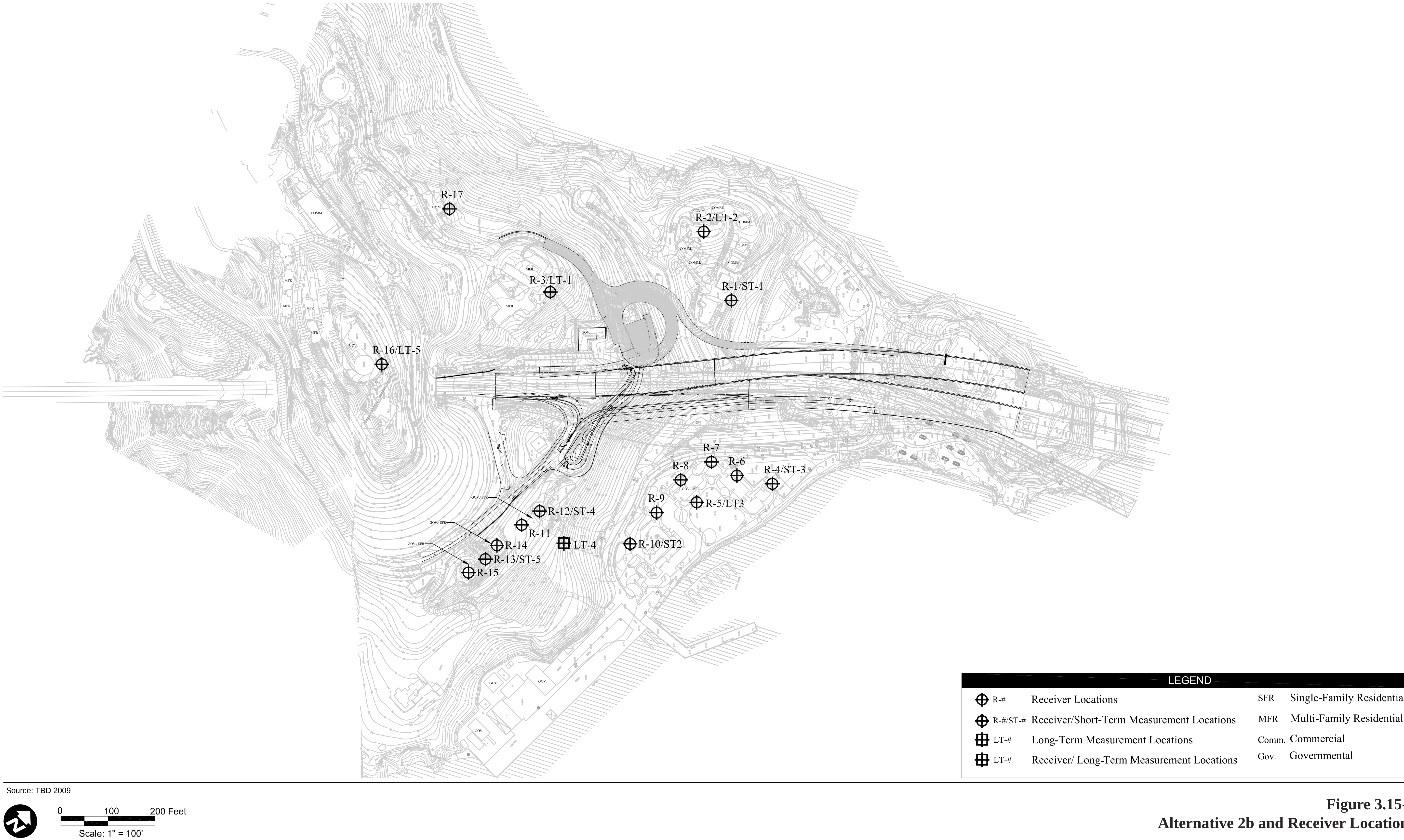
Table 3.15-5: Summary of LT-2
March 30, 2009

Time	L_{eq}	Time	L_{eq}
12:00 a.m.	61.0	12:00 p.m.	66.1
01:00 a.m.	60.3	13:00 p.m.	66.7
02:00 a.m.	60.2	14:00 p.m.	66.8
03:00 a.m.	60.5	15:00 p.m.	66.5
04:00 a.m.	63.6	16:00 p.m.	66.5
05:00 a.m.	65.7	17:00 p.m.	66.7
06:00 a.m.	66.9	18:00 p.m.	66.8
07:00 a.m.	**67.4**	19:00 p.m.	66.1
08:00 a.m.	67.2	20:00 p.m.	65.8
09:00 a.m.	66.8	21:00 p.m.	64.9
10:00 a.m.	66.5	22:00 p.m.	64.0
11:00 a.m.	66.0	23:00 p.m.	62.8

Source: Yerba Buena Ramps Improvement Project, Final Noise Study Report. January 2011a
Bolded numbers indicate the loudest hour.

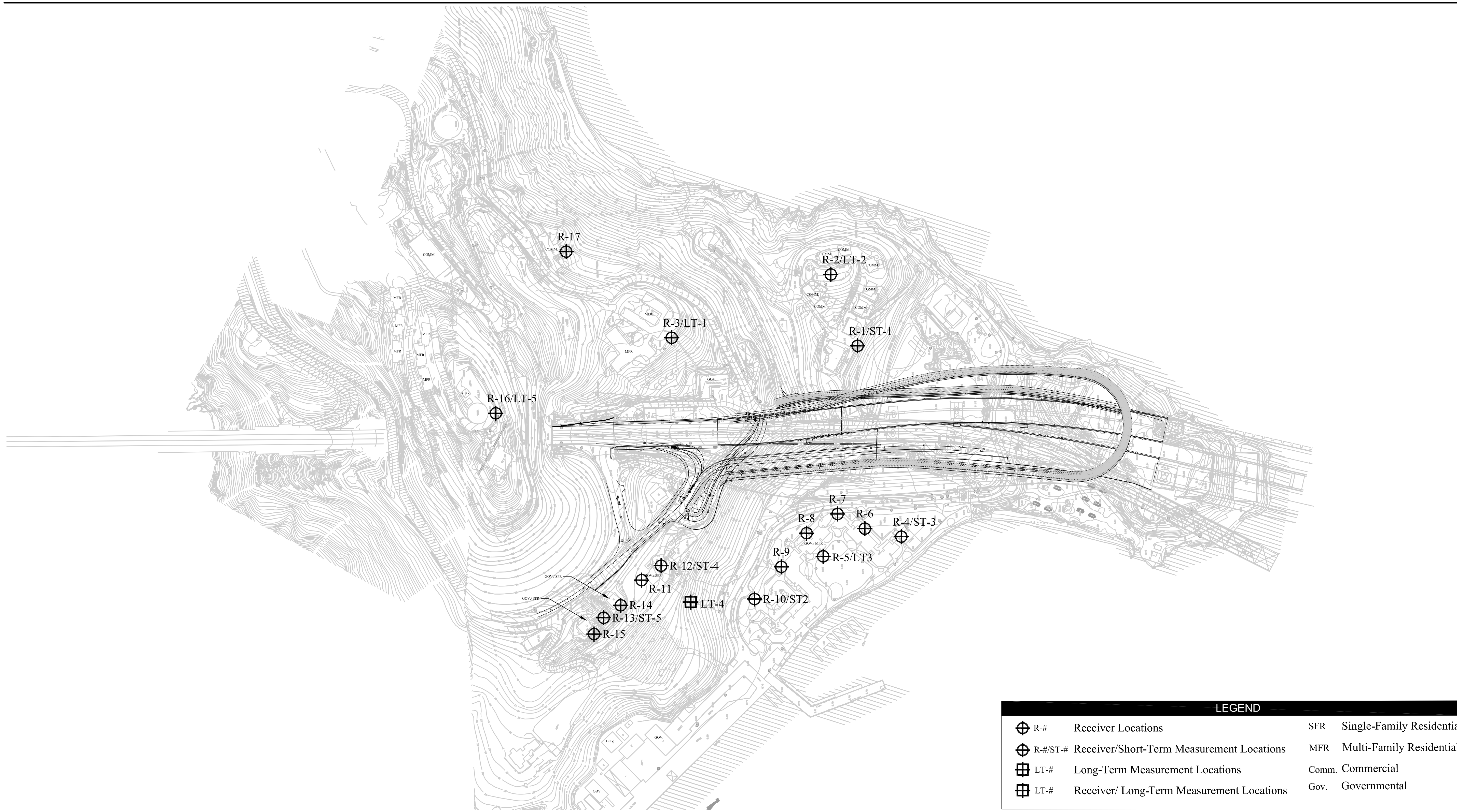
Source: GoogleEarth 2009

Figure 3.15-1
Noise Measurement and Receiver Locations



Source: TBD 2009

Figure 3.15-2
Alternative 2b and Receiver Locations



Source: TBD 2009

0 100 200 Feet
Scale: 1" = 100'

Figure 3.15-3
Alternative 4 and Receiver Locations

Table 3.15-6: Summary of LT-3
March 30, 2009

Time	L_{eq}	Time	L_{eq}
12:00 a.m.	62.6	12:00 p.m.	69.32
01:00 a.m.	61.7	13:00 p.m.	69.7
02:00 a.m.	61.6	14:00 p.m.	69.4
03:00 a.m.	63.1	15:00 p.m.	69.0
04:00 a.m.	66.5	16:00 p.m.	68.8
05:00 a.m.	68.2	17:00 p.m.	69.0
06:00 a.m.	69.6	18:00 p.m.	69.0
07:00 a.m.	**70.4**	19:00 p.m.	68.2
08:00 a.m.	69.5	20:00 p.m.	68.1
09:00 a.m.	69.4	21:00 p.m.	67.1
10:00 a.m.	69.1	22:00 p.m.	66.3
11:00 a.m.	69.0	23:00 p.m.	65.0

Source: Yerba Buena Ramps Improvement Project, Final Noise Study Report. January 2011a
Bolded numbers indicate the loudest hour.

Measurement data for LT-4, Table 3.15-7, indicate that the loudest periods of the day occur during the 6:00 a.m. hour. Table 3.15-7 also indicates noise levels do not fluctuate by more than 2 dBA between 5:00 a.m. and 4:00 p.m. but there is a drop in noise levels after 6:00 p.m., which continues until 6:00 a.m.

Table 3.15-7: Summary of LT-4
April 2, 2009

Time	L_{eq}	Time	L_{eq}
12:00 a.m.	56.8	12:00 p.m.	63.0
01:00 a.m.	55.5	13:00 p.m.	64.0
02:00 a.m.	54.9	14:00 p.m.	62.0
03:00 a.m.	56.5	15:00 p.m.	62.3
04:00 a.m.	59.9	16:00 p.m.	61.1
05:00 a.m.	63.6	17:00 p.m.	61.3
06:00 a.m.	**64.5**	18:00 p.m.	62.6
07:00 a.m.	64.3	19:00 p.m.	61.4
08:00 a.m.	64.1	20:00 p.m.	61.7
09:00 a.m.	63.8	21:00 p.m.	61.4
10:00 a.m.	63.6	22:00 p.m.	61.3
11:00 a.m.	62.9	23:00 p.m.	60.3

Source: Yerba Buena Ramps Improvement Project, Final Noise Study Report. January 2011a
Bolded numbers indicate the loudest hour.

Measurement data for LT-5, Table 3.15-8, indicate that the loudest periods of the day occur during the 5:00 a.m. hour. Table 3.15-8 also indicates noise levels fluctuate by approximately 2 dBA between 4:00 a.m. and 3:00 p.m. but there is a marked drop in noise levels after 3:00 p.m., which continues until 3:00 a.m.

Table 3.15-8: Summary of LT-5
April 6, 2009

Time	L_{eq}	Time	L_{eq}
12:00 a.m.	63.0	12:00 p.m.	71.7
01:00 a.m.	62.6	13:00 p.m.	71.6
02:00 a.m.	64.5	14:00 p.m.	71.4
03:00 a.m.	68.1	15:00 p.m.	71.0
04:00 a.m.	71.9	16:00 p.m.	62.6
05:00 a.m.	**73.1**	17:00 p.m.	68.2
06:00 a.m.	72.4	18:00 p.m.	70.4
07:00 a.m.	71.8	19:00 p.m.	69.3
08:00 a.m.	72.1	20:00 p.m.	69.1
09:00 a.m.	71.7	21:00 p.m.	68.6
10:00 a.m.	71.6	22:00 p.m.	66.5
11:00 a.m.	71.2	23:00 p.m.	64.3

Source: AECOM 2009e
Bolded numbers indicate the loudest hour.

Noise measurement data presented in Tables 3.15-4 through 3.15-8 are generally consistent with the project traffic report, which indicates higher I-80 AM peak hour traffic volumes as compared to the I-80 PM peak hour.

Short-term (ST) noise levels were measured between the hours of 11:00 a.m. and 3:30 p.m. at selected receivers and other points of interest within the project area (Figure 3.15-1). Weather conditions were clear and warm, 19.4 to 32.2°C, with a slight breeze, less than 4.8 km/h (3 mph) each day. All short-term noise measurements were taken outside the loudest hour and were normalized (i.e., adjusted) to reflect the loudest hour based on the results of the 24-hour measurements (see Table 3.15-8 and Appendix M).

Since I-80 is a continuous noise source, background noise (i.e., noise without the traffic noise from I-80, or other local roadways) is not easily measured. However, based on a review of the detailed noise measurement data provided in Appendix M, the background noise level may be estimated at less than 60 dBA L_{eq}, based on the L_{90} measurement (which represents the noise level exceeded 90% of the time during the measurement) at ST measurement sites 4 and 5. The ST noise measurements and the adjusted loudest hour for each location are summarized in Table 3.15-9.

Table 3.15-9: Short-Term Noise Measurement Summary

Site I.D. [1]	Location or Address	Type of Development	Measured Noise Level (L_{eq} dBA)	Adjusted Worst-Hour Noise Level (L_{eq} dBA)
ST-1	1 Whiting Way Historical Village	Commercial	70.4	71.4
ST-2	North Gate Road USCG Station, North Offices	Governmental	64.9	65.9
ST-3	North Gate Road USCG Station, South Parking Lot	Governmental	70.4	71.4
ST-4	Hill Crest Road USCG, Officers Quarters	Single-family Residential	60.5	63.5
ST-5	Hill Crest Road USCG, Officers Quarters	Single-family Residential	57.9	59.9

Source: Yerba Buena Ramps Improvement Project, Final Noise Study Report. January 2011a

[1] See Figure 3.15-1.

While the dominant noise source in the project area, traffic on major local roadways (such as Yerba Buena Road and Macalla Road) represented additional secondary noise sources with a noticeable but insignificant effect on the ambient noise levels as compared to I-80. Smaller local roadways including Forest Road, Healy Avenue, and Hillcrest Crest Road had limited traffic volumes and low speeds, which had a minor effect on ambient noise levels in the project area.

PREDICTED EXISTING NOISE LEVELS AND CALIBRATION

The purpose of model calibration is to “fine-tune” the prediction model to actual site conditions that are not adequately accounted for by the model. Calibration is performed by algebraically adding a constant, or K-factor, to the noise level calculated in TNM 2.5. The magnitude of K-factors is initially determined by the difference between measured and modeled noise levels at specific points. Calibration factors may be positive or negative. Additional factors may be applied based upon the experience and judgment of the noise engineer performing the analysis.

Section N-5400 of the TeNS, Calibrating the Prediction Model, provides guidance on the application of calibrations. Subsection N-5420 states “highway reconstruction projects which significantly alter alignments and profiles of an existing highway are also poor candidates for model calibration.” Additionally, FHWA’s Policy for TNM 2.5 states “[n]o adjustments should be made for differences of less than 3 dBA” (FHWA 2004).

Noise levels were predicted at all receivers, including at ST measurement locations, using TNM 2.5 and various input parameters, as previously discussed, to compare them with adjusted measured traffic noise levels at common points. Differences between measured loudest hour noise levels and the predicted loudest hour noise levels were less than 3 dBA at all receivers except ST-1 (R-2) and ST-3 (R-4). ST-1 (R-2) and ST-3 (R-4) modeled 4 and 5 dBA below the measured noise level at same location. The differences at ST-1 and ST-3 are likely due to reflective noise from the double-decked structure; or local noise sources, including construction activity on the new SFOBB and wave activity along the shore, not accounted for in the noise model. K-factors were applied to receivers R-2 and R-4 for the existing condition model. No K-factors were applied to the future models as the proposed SFOBB would substantially alter the alignment of I-80 as it currently exists; thus the project is a poor candidate for calibration under future conditions. Existing measured and predicted noise levels at specific receiver points are compared and are shown in Table 3.15-10. The existing condition noise model input and output data are included as an appendix to the NSR.

Table 3.15-10: Loudest Hour Noise Level Model Comparison

Measurement ID[1]	Measured Noise Level (L_{eq} dBA)	Loudest Hour Noise Level Adjustment	Adjusted Loudest Hour Noise Level (L_{eq} dBA)	Predicted Loudest Hour Noise Level (L_{eq} dBA)	Difference (K-Factor)
ST-1	70	1	71	67	4 (4.2)
ST-2	65	1	66	66	0
ST-3	70	1	71	65	6 (5.7)
ST-4	61	3	64	66	-2
ST-5	58	2	60	58	2

Source: AECOM 2009e
[1] See Figure 3.15-1.

Based on the existing noise levels, one category B receiver is impacted by existing noise levels that approach or exceed the NAC. The category B receiver is a multiple-family residential receiver (R-3) representing 12 multiple-family units. Additionally, three category C receivers representing two commercial units (R-2 and R-4) are exposed to existing noise levels that approach or exceed the NAC. However, these conditions occur under existing conditions (without the proposed project), and therefore, are not assessed as impacts. The predicted existing noise levels are included in Table 3.15-11 for comparison of the noise level change with the proposed project alternatives.

3.15.3 Environmental Consequences

Traffic noise levels were predicted for three future (2035) alternatives: the No Build Alternative, Alternative 2b (Figure 3.15-2), and Alterative 4 (Figure 3.15-3). Existing and future traffic volumes on all study area roadways were taken from the project traffic report (YBI Ramps Project Traffic Operations Report, 2009b). Speeds were developed from posted speed limits and driving the existing alignment. Vehicle mixes for I-80 were taken from the *2007 Annual Average Daily Truck Traffic on the California State Highway System* report (Caltrans 2008). The traffic mix used for all local streets was 97% automobile, 2% medium trucks, and 1% heavy trucks.

Future traffic speeds and vehicle mixes on all study roadways were assumed to be the same as those used in the existing conditions. The traffic parameters used for the modeling are discussed in detail in the NSR.

Receiver and building locations and elevations were taken from topographic survey data provided by the project engineer. Existing and future roadway geometric data were developed from project design drawings provided by the project engineer. The model input and output sheets for both the No Build Alternative and both build alternatives are included as an appendix in the NSR.

3.15.3.1 Traffic Noise Impacts

Predicted noise levels at each receiver for the three future conditions are shown in Table 3.15-11. The changes in traffic noise levels from the existing condition to the 2035 No Build condition would range from -4 to 2 dBA L_{eq}.

NO BUILD ALTERNATIVE

Under the No Build Alternative noise levels would approach or exceed the NAC at one category B receiver (R-3) representing 12 multiple-family residential units. Predicted noise levels at all other category B receivers under the No Build Alternative range from 41 to 65 dBA L_{eq}. Predicted noise levels at category C receivers would range from 61 to 69 dBA L_{eq}. The increases in noise levels associated with the No Build Alternative would be caused by forecast increased traffic volumes that would occur between the present time and 2035 and the construction and operation of the new SFOBB (YBI Ramps Project Traffic Operations Report, 2009b).

ALTERNATIVE 2B

Under Alternative 2b, noise level changes range from -4 to 2 dBA over existing conditions and 0 to 1 dBA L_{eq} over the No Build Alternative. Under Alternative 2b, noise levels would approach or exceed the NAC at one category B receiver (R-3) representing 12 multiple-family residential units. Predicted noise levels at all other category B receivers under Alternative 2b would range from 41 to 65 dBA L_{eq}. Predicted noise levels at category C receivers under Alternative 2b would range from 61 to 69 dBA $L_{eq.}$

ALTERNATIVE 4

Under Alternative 4, noise level changes range from -4 to 2 dBA over existing conditions and 0 to 1 dBA L_{eq} over the No Build Alternative. Under Alternative 4, noise levels would approach or exceed the NAC at one category B receiver (R-3) representing 12 multiple-family residential units. Predicted noise levels at all other category B receivers under either build alternative range from 41 to 65 dBA $L_{eq.}$ Predicted noise levels at category C receivers under Alternative 4 would range from 61 to 69 dBA $L_{eq.}$

CONCLUSION

The predicted noise levels at each receiver for the three future conditions, shown in Table 3.15-11, would not approach or exceed the respective NAC, except at R-3, which is currently abandoned barracks. Based on a site visit and discussion with a TIDA representative in January 2011, there is no current occupation and the building is anticipated to be demolished according to future plans.

R-1, Event Rental, is a commercial development, designated as NAC activity category C of 72 dBA L_{eq}. With predicted noise levels of 67 dBA L_{eq} at R-1 for each of the 3 alternatives, project noise levels at R-1 are not a noise impact requiring abatement.

R-2, Historic Village, is a commercial development, designated as NAC activity category C of 72 dBA L_{eq}, with predicted noise levels of 69 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-2 are not a noise impact requiring abatement.

R-3, Abandoned Barracks, is a multiple-family residential development, designated as NAC activity category B of 67 dBA L_{eq} with predicted noise levels of 73 dBA L_{eq} for each of the 3 alternatives. However, R-3 is an abandoned barracks and there are no plans to reuse these structures. Therefore, project noise levels at R-3 are not a noise impact requiring abatement.

R-4, North Offices, is a governmental development, designated as NAC activity category C of 72 dBA L_{eq}, with predicted noise levels of 67 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-4 are not a noise impact requiring abatement.

R-5, Parade Ground, is a governmental development, designated as NAC activity category C of 72 dBA L_{eq}, with predicted noise levels of 67 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-5 are not a noise impact requiring abatement.

R-6, USCG Quarters, is a Multiple-Family Residential development, designated as NAC activity category E of 52 dBA L_{eq}, with predicted noise levels of 47 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-6 are not a noise impact requiring abatement.

R-7, USCG Quarters, is a Multiple-Family Residential development, designated as NAC activity category E of 52 dBA L_{eq}, with predicted noise levels of 47 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-7 are not a noise impact requiring abatement.

R-8, USCG Quarters, is a Multiple-Family Residential development, designated as NAC activity category E of 52 dBA L_{eq}, with predicted noise levels of 48 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-8 are not a noise impact requiring abatement.

R-9, USCG Quarters, is a Multiple-Family Residential development, designated as NAC activity category E of 52 dBA L_{eq}, with predicted noise levels of 43 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-9 are not a noise impact requiring abatement.

R-10, South Parking Lot, is a governmental development, designated as NAC activity category C of 72 dBA L_{eq}, with predicted noise levels of 65 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-10 are not a noise impact requiring abatement.

R-11, Officers Quarters, is a single-family residential development, designated as NAC activity category B of 67 dBA L_{eq}, with predicted noise levels of 54 dBA L_{eq} for each of the 3 alternatives. These quarters are not in use. Therefore, project noise levels at R-11 are not a noise impact requiring abatement.

R-12, Officers Quarters, is a driveway location, undesignated as NAC activity category with predicted noise levels of 66 dBA L_{eq} for each of the 3 alternatives. R-12 is a driveway location. Therefore, project noise levels at R-12 are not a noise impact requiring abatement.

R-13, Officers Quarters, is a single-family residential development, designated as NAC activity category B of 67 dBA L_{eq}, with predicted noise levels of 58 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-13 are not a noise impact requiring abatement.

R-14, Officers Quarters, is a single-family residential development, designated as NAC activity category B of 67 dBA L_{eq}, with predicted noise levels of 65 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-14 are not a noise impact requiring abatement.

R-15, Officers Quarters, is a single-family residential development, designated as NAC activity category B of 67 dBA L_{eq}, with predicted noise levels of 64 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-15 are not a noise impact requiring abatement.

R-16, VTS Complex, is a governmental development, designated as NAC activity category C of 72 dBA L_{eq}, with predicted noise levels of 73 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-16 are considered a noise impact requiring abatement.

R-17, Event Rental, is a commercial development, designated as NAC activity category C of 72 dBA L_{eq} with predicted noise levels of 61 dBA L_{eq} for each of the 3 alternatives. Therefore, project noise levels at R-17 are not a noise impact requiring abatement.

As with the No Build Alternative, the primary result of noise level increase would be caused by forecast increased traffic volumes that would occur between the present time and 2035. However, unlike the No Build Alternative some noise level increases would be a result of the proposed ramps under each build alternative. As shown in Table 3.15-11, the maximum increase associated with the either build alternative would be 2 dBA L_{eq}, which is below the Caltrans threshold considered a substantial increase. Thus, the proposed project would not result in a substantial increase.

3.15.3.2 Construction Noise Impacts

Construction noise would be generated by diesel engine-driven construction equipment used for site preparation and grading, removal of existing pavement, loading, unloading, and placing materials and paving. Diesel engine-driven trucks also would bring materials to the site and remove the spoils from excavation. Pile driving would be required as part of the proposed project.

Under load conditions, diesel engine noise levels of typical construction equipment (not including pile driving) may be 85 to 90 dBA at a distance of 15.24 meters (50 feet) from the equipment (FHWA 2006). Maximum noise levels during pavement breaking would be about 90 dBA L_{max}. Pile driving would generate noise that would be different in character from typical construction equipment (described above). Maximum noise levels at 15.24 meters (50 feet) from a pile driver range from 89 to 114 dBA L_{max}, depending on driver power, driver type, pile size, soil characteristics, etc.

Construction equipment noise is considered a “point source” and is attenuated over distance at a rate of 6 dBA for each doubling of distance. Thus, a noise level of 85 dBA at 15.24 meters (50 feet) would be 79 dBA at 30.5 meters (100 feet) and 73 dBA at 61 meters (200 feet) from the source.

During excavating, grading, and paving operations, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for nonequipment tasks, such as measurement. Although maximum noise levels may be 85 to 90 dBA at a distance of 15.24 meters (50 feet) during most construction activities, hourly average noise levels (L_{eq}) near the edge of the project site at locations where the excavation, grading, and paving occur would be anticipated to be 65 to 75 dBA L_{eq}. The typical L_{eq} produced during pile driving ranges from 101 to 105 dBA L_{eq} at 15.24 meters (50 feet).

The nearest occupied residential units (R-6 through R-9 and R-11 through R-15) are located approximately 100.6 meters (330 feet) from the nearest point of construction activities. R-3 is closer but is currently unoccupied with no known plans for occupation. Hourly average construction noise levels (L_{eq}) at this distance would attenuate to approximately 59 dBA L_{eq}, with a maximum noise level of 73 dBA L_{max}. Based on the existing modeling and measurements, these noise levels would barely be noticeable over existing noise levels. Therefore, adverse construction-related noise impacts would not occur from diesel engine noise associated with development of the proposed project.

Pile driving noise would be generated within the project area containing general construction activities. The higher end of pile driving noise levels of 105 dBA L_{eq} and 114 dBA L_{max} at 15.24 meters (50 feet) would attenuate to approximately 89 dBA L_{eq} and 98 dBA L_{max} at the nearest occupied residential units, approximately 100.6 meters (330 feet) away, assume a direct line of sight (without intervening structures and/or topography) between noise source and receiver. If there are intervening buildings and/or topography, pile driving noise levels at the receivers would be substantially less; although it is likely that noise from the pile driving would still be audible at the receivers.

Nighttime construction activities associated with construction of the proposed improvements would be required, specifically paving and striping for detour lanes as these cannot be constructed during daytime hours due to greater daytime traffic. As described previously, noise levels from these activities would be on the order of 75 dBA L_{eq} at 15.24 meters (50 feet) from construction activity. As residential units are located approximately 100.6 meters (330 feet) from these activities, nighttime construction noise levels would be approximately 59 dBA L_{eq} at the nearest residences, which is not sufficient to disturb local residents. Based on the 24-hour measurement (LT-4), noise levels during the quietist hour are on the order of 63 dBA L_{eq}; thus adding the nighttime construction noise of 59 dBA L_{eq} would result in a 1 dBA increase in night ambient levels to 64 dBA L_{eq} at nearby residential units. However, even if noise associated with construction were audible at these residences, these activities would be temporary in nature and would not be considered an adverse impact.

To summarize, construction noise may be heard at nearby sensitive receivers and may cause occasional speech disruption, principally during times of pavement breaking or use of impact equipment. Thus, construction-related noise would not be considered adverse. Measures to minimize construction noise impacts are discussed in Section 3.15.4.

Vibration Impacts

Heavy equipment and trucks used for construction of the proposed project are potential sources of ground vibration, with pile driving being the greatest source of vibration. Vibration levels for impact pile drivers are typically 0.02 meters/second peak particle velocity (PPV) (0.644 inches/second PPV at 7.6 meters (25 feet) (FTA 1995). As vibration decreases with distance from the source, vibration levels beyond 7.6 meters (25 feet) are below the damage threshold for residential buildings; beyond 60.9 meters (200 feet) for fragile buildings. The locations where pile driving would occur are more than 91.4 meters (300 feet) from any structures. Therefore, project vibration levels would not result in a significant vibration impact.

Table 3.15-11: Predicted Noise Levels

Receiver I.D.	Location or Address	Type of Development	Number of Units Represented	NAC	Existing	No Build Alternative			Alternative 2b			Alternative 4		
					Predicted Noise Level dBA L_{eq}	Predicted Noise Level dBA L_{eq}	Increase less Existing dBA L_{eq}	Impact Type	Predicted Noise Level dBA L_{eq}	Increase, Build less Existing dBA L_{eq}	Impact Type	Predicted Noise Level dBA L_{eq}	Increase, Build less Existing, dBA L_{eq}	Impact Type
R-1	7 Whiting Way, Event Rental	Commercial	2	C(72)	68	67	-1	None	67	-1	None	67	-1	None
R-2	1 Whiting Way, Historical Village	Commercial	5	**C(72)**	**71**	69	-2	None	69	-2	None	69	-2	None
R-3	240 Macalla Road USCG, Abandon Barrack	Multiple-family Residential	12	**B(67)**	**74**	**73**	-1	**A/E**	**73**	-1	**A/E**	**73**	-1	**A/E**
R-4	North Gate Road USCG Station, North Offices	Governmental	1	**C(72)**	**71**	67	-4	None	67	-4	None	67	-4	None
R-5	North Gate Road USCG Station, Parade Ground	Governmental	1	C(72)	70	67	-3	None	67	-3	None	67	-3	None
R-6	USCG, Quarters[1]	Multiple-family Residential	2	E(52)	47	47	0	None	47	0	None	47	0	None
R-7	USCG, Quarters[1]	Multiple-family Residential	2	E(52)	47	47	0	None	47	0	None	47	0	None
R-8	USCG, Quarters[1]	Multiple-family Residential	2	E(52)	44	44	0	None	44	0	None	44	0	None
R-9	USCG, Quarters[1]	Multiple-family Residential	2	E(52)	43	43	0	None	43	0	None	43	0	None
R-10	North Gate Road USCG Station, South Parking Lot	Governmental	1	C(72)	66	65	-1	None	65	-1	None	65	-1	None
R-11	Hill Crest Road USCG, Officers Quarters	Single-family Residential	1	B(67)	55	54	-1	None	54	-1	None	54	-1	None
R-12	Hill Crest Road USCG, Officers Quarters	Driveway	0	--	66	66	0	NA	66	0	NA	66	0	NA
R-13	Hill Crest Road USCG, Officers Quarters	Single-family Residential	1	B(67)	57	58	1	None	58	1	None	58	1	None
R-14	Hill Crest Road USCG, Officers Quarters	Single-family Residential	1	B(67)	65	65	0	None	65	1	None	65	0	None
R-15	Hill Crest Road USCG, Officers Quarters	Single-family Residential	1	B(67)	62	64	2	None	64	2	None	64	2	None
R-16	Signal Road USCG, VTS complex	Governmental	1	C(72)	**71**	**73**	2	**A/E**	**73**	2	**A/E**	**73**	2	**A/E**
R-17	62 Macalla Road, Event Rental	Commercial	1	C(72)	60	61	1	None	61	1	None	61	1	None

Source: Yerba Buena Ramps Improvement Project, Final Noise Study Report. January 2011a
Note: A/E = Approach or Exceed; NAC - Noise Abatement Criterion; Bold = traffic noise impact
[1] Noise levels reported for these receivers are reduced by 20 dBA to represent interior noise levels.

3.15.4 Avoidance, Minimization, and/or Abatement Measures

The following minimization and/or mitigation measures would be performed to reduce the potential impacts from potential environmental issues to the fullest extent practicable.

3.15.4.1 Traffic Noise Abatement

Noise abatement must be considered where traffic noise impacts are identified. Impacts have been identified at two receivers (R-3 and R-16) under the No Build and both build alternatives. According to FHWA and Caltrans criteria, noise abatement must be considered at impacted receivers where there is an exposed area of frequent human use (such as a yard, patio, or deck) and a lowered noise level would be of benefit. R-3 does not represent a residential use. Thus, a lowered noise level at this location would not be of benefit and noise abatement is not further considered, therefore a Noise Abatement Decision Report (NADR) is not required.

R-16 represents a governmental unit. Although this receiver represents an area of human use, it is associated with a parking lot that has only transitory use (i.e. less than an hour) and would not result in a cumulative amount of time on a daily, weekly, or yearly level that would be considered frequent or have detrimental effects on the activities of humans at the receiver location. Thus, a lowered noise level at this location would not be a benefit and abatement is not considered further for R-16. Future plans would relocate personnel associated with this site to a lower portion of USCG Sector San Francisco. As no feasible noise abatement has been identified, a NADR is not required.

3.15.4.2 Construction Noise Abatement

As required by the Caltrans' Standard Specification 14-8.02, "Noise Control":

- Each internal combustion engine shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.

No construction is proposed for the No Build Alternative. Therefore, construction noise abatement would not be required. The following measures are recommended to avoid or minimize construction noise impacts associated with Alternatives 2b and 4:

- Work in staging areas that generate loud noises, such as equipment maintenance, shall not occur during the hours prohibited for construction work.

- If traffic control and construction signs that require power for lighting or flashing are located near residential units, the source of power would be batteries, solar cells, or another quiet source. Gas- or diesel-fueled internal combustion engines would not be used.

Due to the proximity of the USCG Sector San Francisco facility to the construction area, a Memorandum of Understanding (MOU)/Memorandum of Agreement (MOA) shall be prepared detailing limitations on noise and impact activities prior to construction commencing.

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3.16 Energy

This section assesses the impact of the project alternatives on transportation-related energy consumption in the study area. This analysis considers the long-term (direct) and temporary impacts related to energy consumption. Direct energy consumption includes the fuel required for passenger vehicles (automobiles, vans, and light trucks), heavy trucks (three or more axles), and transit buses.

3.16.1 Regulatory Setting

The CEQA Guidelines, Appendix F, Energy Conservation, state that EIRs are required to include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy. NEPA (42 U.S.C. Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

Regulations for transportation energy consumption are generally directed toward motor vehicle fuel efficiency. The Energy Policy and Conservation Act of 1992 established fuel economy standards for on-road vehicles in the United States. Under this law, the National Highway Traffic and Safety Administration is responsible for reviewing and updating these standards. The USEPA administers the Corporate Average Fuel Economy (CAFE) program, which ensures that vehicle manufacturers are in compliance with the standards.

3.16.2 Affected Environment

Existing energy consumption in the study area consists of direct energy consumption resulting from automobile and transit operations. Indirect energy involves the one-time, nonrecoverable energy consumption associated with the construction of roadways, structures, and vehicles. In addition to fuel consumption of vehicles involved in the actual construction of different elements of the alternatives, construction energy consumption also includes the energy needed in the production of construction materials. Indirect energy also involves the manufacturing and maintenance of vehicles. This includes passenger vehicles, heavy trucks, and transit buses. Permanent direct energy consumption involves the fuel needed by all of the vehicles (automobile, truck, bus, or transit lane vehicle) in the project area.

3.16.3 Environmental Consequences

NO BUILD ALTERNATIVE

The indirect energy consumption of the No Build Alternative would only be associated with the manufacturing and maintenance of passenger vehicles, heavy trucks, and transit buses. As discussed in the Section 3.6, Traffic and Transportation/Pedestrian and Bicycle Facilities, the long-term LOS under the No Build Alternative would be expected to worsen over existing conditions and delays and queues on YBI would increase as the demand would exceed the capacity of the ramps. Therefore, long-term energy consumption would increase under the No Build Alternative.

ALTERNATIVE 2B AND ALTERNATIVE 4

The build alternatives would be conserving natural resources and limiting energy consumption in several ways. The increased on- and off-ramp capacity and improved geometry would reduce travel times for motorists on the SFOBB mainline, which would provide for less vehicle operating time which, in turn, reduces wear on the vehicles and reduces fuel consumption. Additional savings on the SFOBB mainline would result from fewer vehicle stops and starts (which is the most wasteful condition in terms of fuel). Energy consumption on the islands would be expected to increase, however this would be due to the TI/YBI Redevelopment Project which is undergoing its own environmental process under CEQA and is a separate and independent project from the YBI ramps. To improve traffic flow on the islands, the ramps would be metered. Metering the ramps as a system would allow Caltrans to optimize the efficiency of the on- and off-ramps access.

It is Caltrans' goal to construct this proposed project in the least amount of time by planning and staging the work efficiently. Short-term, indirect energy consumption would be associated with the construction of the ramps and associated construction equipment. This impact would not be adverse due to the temporary nature of construction activities. Construction vehicles and activities would increase energy consumption at the project site for 3 and 3 ½ years for Alternative 2b and 4 respectively, and would cease thereafter. Energy consumption would be a one-time, non-recoverable occurrence related to the production of construction materials (i.e. cement, steel, asphalt), energy needed to produce these materials, and use of construction equipment (i.e. use of diesel, oil, fuel). The reduced construction time would lead to a low number of construction-related delays and make the benefits of the project available sooner. Caltrans is also proposing to reuse and incorporate existing materials (those that can be) into the final product. Any pavement and construction debris that is removed would be considered for recycling or reuse. Recycling saves the fuel and materials that would have been required to create new materials. The design of each build alternative would also reflect an attempt to reduce the number of utilities that need to be either relocated or replaced as part of the project. Where possible, utilities would be left in place and incorporated.

Caltrans has recently been identifying ways to incorporate a greener construction fleet and is developing construction specifications by which construction-related emissions would be reduced. The Caltrans Fleet Greening Program goal is to promote an efficient fleet mix and use of efficient, low emission vehicles to lower Caltrans' use of petroleum as well as reduce emissions of criteria air pollutants and greenhouse gases (Caltrans 2010). The green fleet includes hybrid passenger vehicles, solar-powered equipment, propane-fueled vehicles, low dust street sweepers, and diesel particulate filters on heavy-duty, diesel-powered vehicles (Caltrans 2010b). To the extent possible and appropriate, the green specifications would be considered for incorporation into the various construction contracts to build the project. As such, long-term energy consumption would be reduced compared to future no build conditions.

3.16.4 Avoidance, Minimization, and/or Mitigation Measures

The No Build Alternative would result in an increase in energy usage as traffic demand on the existing on- and off- ramps increases over time and the capacity is not increased to meet the projected demands. Caltrans would potentially develop minimization measures in the future to address the impacts. The two build alternatives would result in a short-term increase in energy consumption from construction activities, but over the long-term would not result in a need to implement avoidance, minimization, or mitigation measures resulting from project-related impacts to growth on YBI and TI, given that energy consumption would be reduced.

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3.17 Biological Environment

3.17.1 Natural Communities

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. Wetlands and other waters are discussed below in Section 3.17.2.

Due to the disturbed nature of the project site, proximity to existing construction, and the absence of wildlife corridors given the site's orientation on the edge of a developed area as well as the Bay, both project alternatives would not result in habitat fragmentation. Consequently, habitat fragmentation is not discussed further.

3.17.1.1 Affected Environment

The following technical reports were consulted:

- Natural Environment Study: YBI Ramps Improvement Project. (2011b) [NES. Appendix N].
- Yerba Buena Island Ramps Improvement Project Botanical Assessment (2009e). [included in NES. Appendix N].
- Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish and wildlife. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P. R. Olofson, editor. San Francisco Bay Regional Water Quality Control Board, Oakland, California (2000).
- List of California Terrestrial Natural Communities Recognized by the Natural Diversity Data Base. Natural Heritage Division. The Resources Agency. September. http://www.dfg.ca.gov/whdab/pdfs/natcomlist.pdf (2003)
- Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131 pp. (1979)
- YBI Ramp Improvements – PEAR (2007).
- Preliminary Descriptions of the Terrestrial Natural Communities of California. California Department of Fish and Game, The Resources Agency. 156 pp. (1986)
- Biological Monitoring and Mitigation Compliance Report (March, April and May) (2008).
- Transfer and Reuse of Naval Station Treasure Island: Final Environmental Impact Report Vol 1: Chapters 1 to 10 (2006)
- A Manual of California Vegetation. California Native Plant Society, Sacramento. 471 pp. (1995)

- San Francisco Oakland Bay Bridge - East Span Seismic Safety Project Final Environmental Impact Statement/Statutory Exemption and Final 4(f) Evaluation. May. http://www.dot.ca.gov/dist4/eastspans/index.html. (2001)

Remnant sensitive natural communities are present in small patches on-site, including northern foredune and central coast riparian scrub. Northern Foredune and Central Coast Riparian Scrub are shown along with other adjacent biological communities in Figure 3.17-2. There are no Habitat Conservation Plans or Multiple Species Conservation Plans that include the project site.

NORTHERN FOREDUNE

Northern foredune is generally found behind active beaches and in front of more stabilized back dune coastal scrubs. This plant community is similar to active coastal dunes but is somewhat more sheltered from wind and may have a greater supply of groundwater. This zone is also referred to as coastal strand vegetation. This pioneer habitat typically has low species diversity, being dominated by prostrate herbs and grasses with creeping stems or rhizomes. These salt tolerant plants are also tolerant of repeated burial by shifting sands and contribute to dune stabilization. Northern foredune vegetation occurs in areas of sand accumulation along the immediate coast from Monterey County to Oregon (Holland 1986).

Within the biological study area (BSA), a narrow 0.178 hectare (0.440-acre) strip of northern foredune vegetation occurs along the northwestern portion of the site (Figure 3.17-2). In addition there is an approximately 4.57-meter-wide (15-foot-wide) patch of invasive, non-native *Spartina alterniflora* hybrid on the northeastern portion of the site, north of the bridge. This species is more typical of northern coastal salt marsh but its invasive nature warrants mention here. The patch was treated with herbicide by the Invasive Spartina Project in September 2008 (Hogle 2008). Wave action in the BSA appears to be too strong to allow substantial northern coastal salt marsh vegetation to develop.

The northern foredune vegetation on-site is dominated by non-native iceplant (*Carpobrotus edulis*) and sweet fennel. Diagnostic foredune species present include sea rocket (*Cakile maritima*) and iceplant, although additional species may be present and observable during other seasons. Native species observed include alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), and spearscale (*Atriplex triangularis*). Other non-native species present include cheeseweed, dill daisy (*Argyranthemum* sp.), Russian thistle (*Salsola soda*), and seedlings of wild radish (*Raphanus sativa*). Wood's plant list (2007) indicates that other foredune species are present on the island, including several special-status species, but these have been primarily documented on the less-disturbed western portion of YBI. These species include dune gilia (*Gilia capitata* ssp. *capitata*, CNPS 1B.1), woolly-sunflower (*Eriophyllum staechadifolium*), yellow bush lupine (*Lupinus arboreus*), and beach bursage (*Ambrosia chamissonis*).

Within the BSA, northern foredune most closely corresponds to the iceplant series as classified by Sawyer and Keeler-Wolf (1995) and is upland following Cowardin et al. (1979). Northern foredune habitat in undisturbed areas such as outer Point Reyes is used for nesting and foraging by several bird species including western snowy plover (*Charadrius alexandrinus nivosus*), Federally listed as threatened, and a California Species of Special Concern. However, remnant small patches of northern foredune habitat such as that found on-site are unlikely to be used for nesting by most avian species, due to the prevalence of iceplant and lack of sandy dunes. These patches are more likely to be used only for foraging and roosting by shorebirds and waterbirds, particularly gulls (*Larus* spp.), and generalist landbirds nesting in other habitats nearby.

CENTRAL COAST RIPARIAN SCRUB

Central coast riparian scrub typically consists of a scrubby streamside, with open to impenetrable thickets composed of any of several species of willows (*Salix* spp.). This plant community occurs close to river channels and near the coast on fine-grained sand and gravel bars with a high water table. It is distributed along and at the mouths of most perennial and many intermittent streams of the southern coast ranges, from the Bay Area to near Point Conception (Holland 1986). Central coast riparian scrub is generally regarded as early seral, meaning that it typically precedes the development of other riparian woodland or forest communities in the absence of severe flooding. However, outside of riparian situations, that is, near groundwater seeps, willow-dominated scrub represents a relatively stable plant community and is not considered seral.

Within the BSA, an approximate 0.011 hectare (0.028-acre) patch of central coast riparian scrub occurs at the southern end of the northern foredune community where a culvert empties into the bay (Figure 3.17-2). A patch of vegetation in this area referred to as riparian scrub was also noted in the Transfer and Reuse of Naval Station Treasure Island FEIR (San Francisco Planning Department 2006). The sole species occurring in the BSA is arroyo willow (*Salix lasiolepis*). This species generally indicates the presence of freshwater. On-site, central coast riparian scrub conforms to the arroyo willow series as described in Sawyer and Keeler-Wolf (1995) and palustrine shrub-scrub wetland following Cowardin et al. (1979).

Wildlife species found in central coast riparian scrub would be similar to that found in other scrub communities as noted above. Additionally, the thick stands of willow species that characterize central coast riparian scrub habitat provide cover and nesting habitat for a variety of birds, including white-crowned sparrow, song sparrow, and house finch.

3.17.1.2 Environmental Consequences

Permanent project features would entirely avoid the northern foredune and central coast riparian scrub vegetation on-site. Temporary staging and construction access would occur directly adjacent to these habitat patches.

3.17.1.3 Avoidance, Minimization, and/or Mitigation Measures

With implementation of the avoidance and minimization measures described below, both project alternatives would not result in impacts to northern foredune and central coast riparian scrub vegetation.

Potential impacts during construction activities would be avoided by placement of ESA exclusion fencing 3 meters (10 feet) from the perimeter of these communities. Contractor education would be conducted, bright-colored ESA fencing and signage shall be implemented, and a construction monitor shall confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. If necessary, fence repair and/or reinforcements shall be completed immediately.

3.17.2 Wetlands and Other Waters

3.17.2.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the Federal level, the CWA (33 U.S.C. 1344) is the primary law regulating wetlands and waters. The CWA regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by USEPA.

EO 11990, Protection of Wetlands, also regulates the activities of Federal agencies with regard to wetlands. Essentially, this executive order states that a Federal agency, such as FHWA, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds (1) that there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the California Department of Fish and Game (CDFG) and RWQCBs. In certain circumstances, the Coastal Commission (or San Francisco Bay Conservation and Development Commission [BCDC]) may also be involved. Sections 1600–1607 of the Fish and Game Code require any agency that proposes a project that would substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement would be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the CWA. Please see Section 3.10, Water Quality, for additional details.

BCDC was created by the McAteer-Petris Act of 1965. BCDC's mission is to promote responsible planning for the San Francisco Bay, and to regulate activities in the Bay in an effort to eliminate unnecessary fill in the Bay and to protect its shoreline. BCDC's jurisdiction usually extends to all areas of the Bay subject to tidal action (including open bay, marshes, and mudflats) including a 30.5-meter-wide (100-foot-wide) band of the shoreline extending landward from the mean high water line, as well as salt ponds, managed wetlands, and waterways flowing into the Bay. BCDC has the authority to issue or deny permit applications for land, water, or structural changes, and dredge or fill activities proposed within the area of its jurisdiction. Any project that calls for an increase to a structure's surface area by 464 square meters (4,994 square feet) requires a Major permit from BCDC.

3.17.2.2 Affected Environment

The following technical reports were consulted:

- Natural Environment Study: YBI Ramps Improvement Project. (2011b) [NES. Appendix N]

- Yerba Buena Island Ramps Improvement Project Botanical Assessment. (2009e) [NES. Appendix N]

- U.S. Army Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. January. 100 pp. (1987)

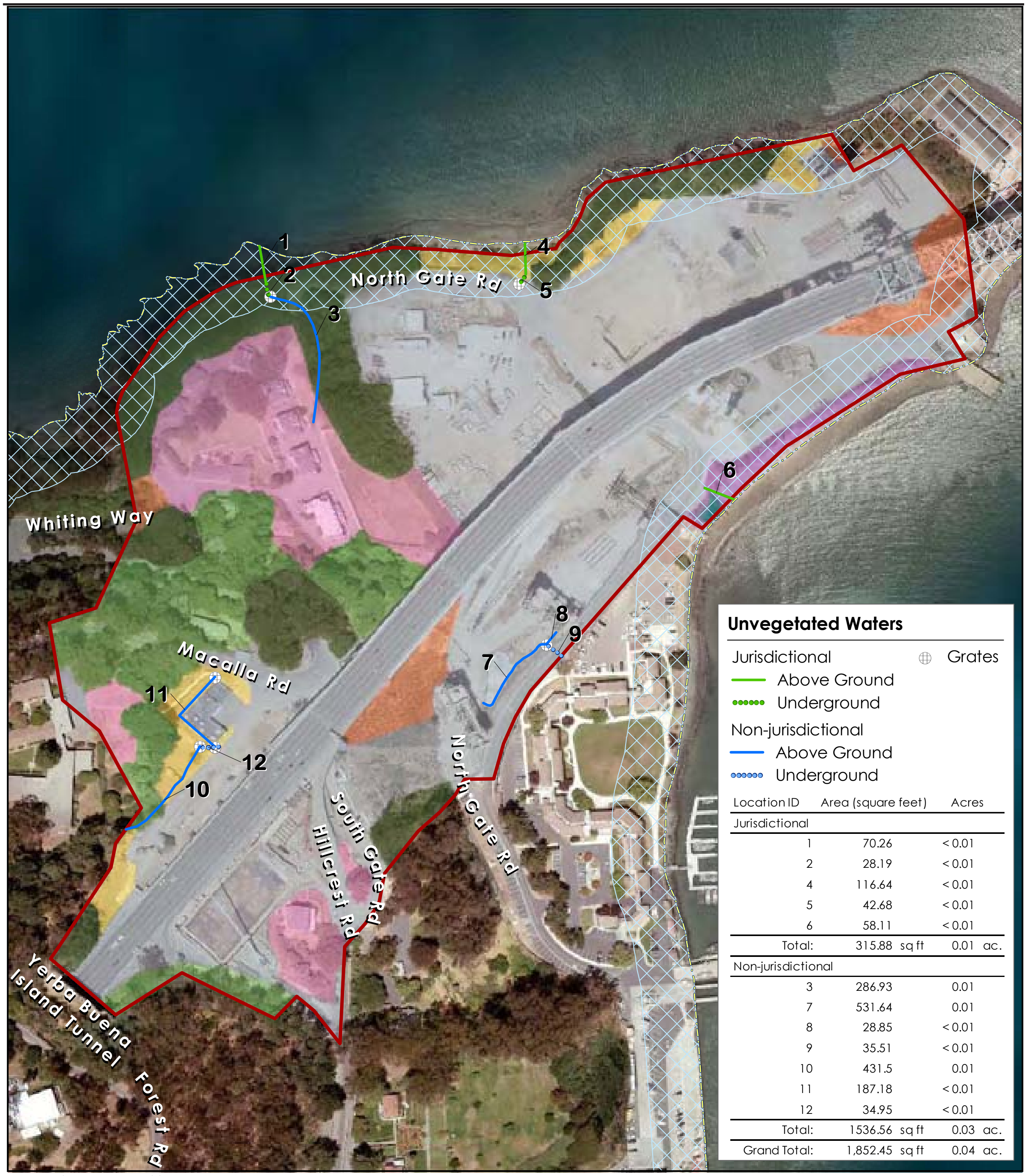
- YBI Ramp Improvements – PEAR (2007).

- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2). Ed. J. S. Wakely, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center. September. http://el.erdc.usace.army.mil/elpubs/pdf/trel08-28.pdf. (2008)

The BSA, located within the Oakland West 7.5' USGS Quadrangle, encompasses the northeastern tip of YBI, from the first dry structural footing for the west side of the eastern span of the SFOBB, to the eastern YBI tunnel entrance, and borders active USCG facilities to the south, the Bay to the north and east, and the YBI tunnel, former U.S. Navy station structures, and current residential development to the west (Figure 3.17-1). Current construction activities, as well as associated trailers and staging areas, for the SFOBB East Span Seismic Safety Project are ongoing on the eastern side of the BSA, and as such a large portion of the BSA is currently characterized by active construction, and is largely unvegetated (Figure 3.17-2). The western portion of the BSA is a mixture of landscaped and developed areas, roadways, and disturbed natural communities. Concurrent with the site reconnaissance, biologists conducted a wetland delineation and preliminary jurisdictional determination of the project site in accordance with the procedures outlined in the USACE Wetlands Delineation Manual (Environmental Laboratory 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). The entire BSA was surveyed on foot and all distinct plant communities were visited and described (Figure 3.17-2). Locations of potential wetlands and waters of the United States and State were recorded and mapped on a 1"=50' aerial map of the project area. There is a total of 172 square meters (1,852 square feet) of unvegetated waters within the BSA that may be regulated by the USACE and RWQCB under the CWA. Of the total 172 square meters (1,852 square feet) of unvegetated waters, 36 square meters (386 square feet) may also be regulated by the BCDC. The mean high tide water level corresponds to Federally jurisdictional tidal waters of the Bay (Figure 3).

Source: GoogleEarth 2008, DMJM Harris, EDAW

Figure 3.17-1
Study Area



Location ID	Area (square feet)	Acres
Jurisdictional		
1	70.26	< 0.01
2	28.19	< 0.01
4	116.64	< 0.01
5	42.68	< 0.01
6	58.11	< 0.01
Total:	315.88 sq ft	0.01 ac.
Non-jurisdictional		
3	286.93	0.01
7	531.64	0.01
8	28.85	< 0.01
9	35.51	< 0.01
10	431.5	0.01
11	187.18	< 0.01
12	34.95	< 0.01
Total:	1536.56 sq ft	0.03 ac.
Grand Total:	1,852.45 sq ft	0.04 ac.

Vegetation Communities

- Central Coast Riparian Scrub (.028 ac)
- Eucalyptus Woodland (4.110 ac)
- Landscaped/Disturbed (3.788 ac)
- Mixed Broadleaf-Conifer Forest (3.326 ac)
- Nonnative Scrub/Shrubland (1.181 ac)
- Northern Foredune (.440 ac)
- Ruderal/Disturbed (1.065 ac)
- Urban (19.615 ac)
- Study Area
- Mean High Tide Line
- BCDC Jurisdiction

Source: GoogleEarth 2008, DMJM Harris, AECOM

0 200 400 Feet

Figure 3.17-2
Vegetation Communities

The southeast edge of the BSA boundary runs at or slightly above the mean high tide line. On the northern edge of the BSA, the boundary is well above the mean high tide line.

Based on a preliminary review of photos and the jurisdictional determination map the USACE indicated via e-mail correspondence on January 4th, 2011, that several of the unvegetated waters features appear to have been constructed in uplands, drain only uplands, and are therefore not jurisdictional. USACE stated that the remaining features (Location ID's 1, 2, 4, 5, and 6), based on their position in the landscape (topography), would indicate that they are natural ephemeral drainages, although some of them have been armored with concrete or filled with debris over the years.

3.17.2.3 Environmental Consequences

No evidence of wetlands was found in the BSA. For both Alternatives 2b and 4, the potential Federal or state jurisdictional waters on-site consist solely of unvegetated waters flowing in concrete or roadside swales (Figure 3.17-2). Nearly all of these unvegetated waters demonstrate a direct connection to the Bay through culvert outlets on the shoreline. Due to the steep gradient, only the outer few feet of these waters, where they empty into the Bay, are below mean high tide (approximately 1.5 meters [5 feet] in elevation) and are tidally influenced. The downstream portions of these waters within 30.5 meters (100 feet) of the mean high tide line, which includes the segments under tidal influence, are under jurisdiction of BCDC, along with the entire shoreline (Figure 3.17-2). There would be no temporary or permanent impacts to tidal waters under either alternative. There would be no permanent impacts to Federal and state jurisdictional unvegetated waters under either project alternative. These jurisdictional features will be avoided by permanent and temporary construction activities under both alternatives.

Approximately 0.01 acre (586 square feet) of non-jurisdictional unvegetated waters will be temporarily disturbed during project construction where they coincide with potential staging and access areas for both project alternatives (Figures 3.17-3 and 3.17-4). Unvegetated waters that will be subject to temporary disturbance do not fall within 30.5 meters (100 feet) of the mean high tide line and are entirely outside the jurisdiction of the BCDC. These drainages are concrete-lined and convey storm water runoff; therefore, they have minimal value as aquatic habitat. These features would be restored to their current condition after construction staging is complete. Both project alternatives would be elevated above these features; therefore, post-construction impacts are not expected.

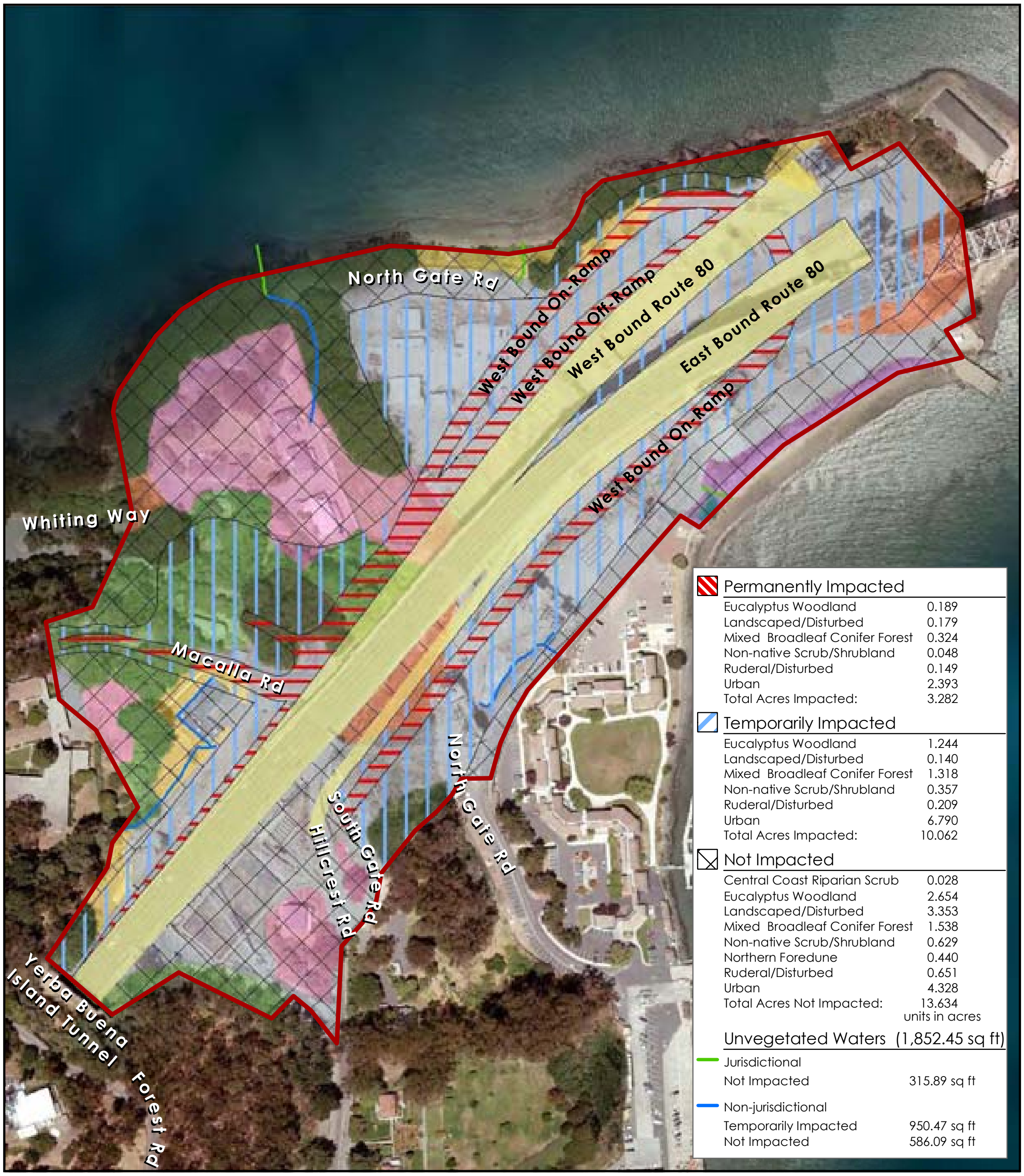
Table 3.17-1: Jurisdictional Waters

Potential Jurisdictional Agency	Jurisdictional Feature	Total Within Study Area square feet (acres) (square meters [square feet])	Not Impacted square feet (acres)	Temporary Impacts square feet (acres)	Permanent Impacts square feet (acres)
RWQCB (Waters of the State)	Unvegetated Waters	1,742.4 (0.04)	2b – 1,742.4 (0.04) 4- 1,742.4 (0.04)	2b –0 4 – 0	0
USACE (Waters of the US)	Unvegetated Waters	1,742.4 (0.04)	2b –1,742.4 (0.04) 4- 1,742.4 (0.04)	2b –0 4 – 0	0

Table 3.17-2: BCDC Jurisdiction

Jurisdictional Agency	Jurisdictional Area	Total Within Study Area (acres)	Not Impacted (acres)	Temporary Impacts[1] (acres)	Permanent Impacts[1] (acres)
BCDC	Within 100 feet of Mean High Tide	4.39 acres	2b-4.38 acres 4-4.03 acres	2b-0.0 acres 4-0.36 acres	2b-0 acres 4-0.25 acres

[1]Lands affected by project alterantives falling within BCDC jurisdiction are considered uplands.



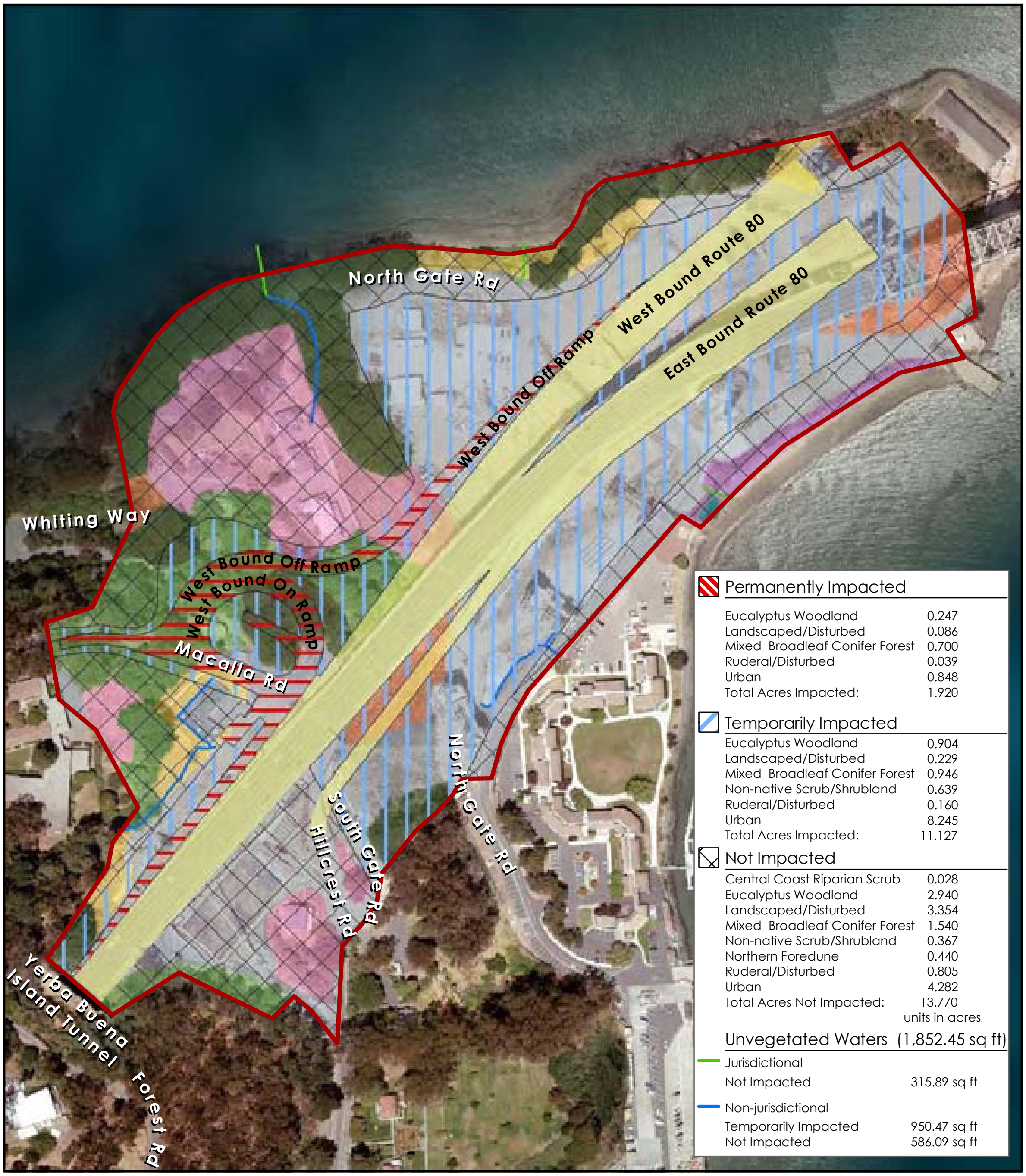
Vegetation Communities

- Central Coast Riparian Scrub (.028 ac)
- Eucalyptus Woodland (4.110 ac)
- Landscaped/Disturbed (3.788 ac)
- Mixed Broadleaf Conifer Forest (3.326 ac)
- Non-native Scrub/Shrubland (1.181 ac)
- Northern Foredune (.440 ac)
- Ruderal/Disturbed (1.065 ac)
- Urban (19.615 ac)
- Study Area

Source: GoogleEarth 2008, DMJM Harris, AECOM

0 150 300 Feet

Figure 3.17-3
Alternative 4 Impacts to Vegetation Communities and Aquatic Habitats



Vegetation Communities

- Central Coast Riparian Scrub (.028 ac)
- Eucalyptus Woodland (4.110 ac)
- Landscaped/Disturbed (3.788 ac)
- Mixed Broadleaf-Conifer Forest (3.326 ac)
- Nonnative Scrub/Shrubland (1.181 ac)
- Northern Foredune (.440 ac)
- Ruderal/Disturbed (1.065 ac)
- Urban (19.615 ac)
- Study Area

Source: GoogleEarth 2008, DMJM Harris, AECOM

0 150 300 Feet

Figure 3.17-4
Alternative 2b Impacts to Vegetation Communities and Aquatic Habitats

Under Alternative 2b there will be no permanent impacts or temporary disturbance to lands falling under the purview of BCDC. Alternative 4 will involve permanent impacts to 0.25 acres and temporary disturbance to lands totaling 0.36 acres which fall under the purview of BCDC. The lands within 30.5 meters (100 feet) of the mean high tide that will be permanently or temporarily affected are considered uplands (Figure 3.17-2). Temporarily disturbed habitats will be restored, to the extent feasible, to their natural condition after completion of the project. Unvegetated waters on-site consist of concrete-lined drainages adjacent to roadways. Only 586 square feet (0.01 acre) of non-jurisdictional features will be disturbed by temporary construction activities. Therefore notifications or permits are not anticipated (e.g., 404 CWA permit from USACE and 401 Certification from RWQCB). The unvegetated non-jurisdictional features would be restored at a 1:1 ratio on-site post-construction; therefore, compensatory measures are not anticipated. The project will be reviewed with RWQCB to ensure adequate water quality protection during and after construction. A SWPPP will be developed and standard construction BMPs implemented to meet RWQCB standards. The SWPPP will be reviewed and approved by the RWQCB. Given that the project would not result in a permanent loss of aquatic features, compensatory measures for aquatic features are not proposed.

3.17.2.4 Avoidance, Minimization, and/or Mitigation Measures

For both alternatives, the tidal waters of the Bay would be avoided through project design to stay outside the boundary of the tidal waters to the extent possible. An existing road would be used by construction vehicles in this vicinity. Tidal waters would not be affected by temporary construction activities due to implementation of standard construction BMPs to treat and minimize discharge into the Bay (Figures 3.17-3 and 3.17-4). Existing SFOBB project staging areas that are present within the BSA and addressed herein would be largely utilized for construction staging and access. Standard construction BMPs, including placement of straw wattles or silt fencing along the boundary of the project area, would be implemented according to an erosion control plan, which would be prepared to avoid discharge into the waters of the Bay during staging and construction of the ramps. Catch basin inlet protection and installation of straw wattles (fiber rolls) would be implemented throughout the site during construction. Other construction BMPs that would be reviewed and coordinated with the RWQCB for implementation during work near the Bay waters are discussed in Section 3.9, Hydrology and Floodplains.

3.17.3 Plant Species

3.17.3.1 Regulatory Setting

The U.S. Fish and Wildlife Service (USFWS) and CDFG share regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see Section 3.17.5, Threatened and Endangered Species, in this document for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including CDFG fully protected species and species of special concern, USFWS candidate species, and those on the California Native Plant Society's (CNPS') statewide and East Bay Chapter's list of sensitive plants.[20]

The regulatory requirements for FESA can be found at 16 U.S.C. Section 1531, et seq. See also 50 C.F.R. Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Caltrans projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Sections 1900–1913, and CEQA, Public Resources Code, Sections 2100–21177.

3.17.3.2 Affected Environment

The following technical reports were consulted:

- Natural Environment Study: YBI Ramps Improvement Project. (2011b) [NES. Appendix N].
- Yerba Buena Island Ramps Improvement Project Botanical Assessment. (2009e) [included in NES. Appendix N].
- Selected tidal marsh plant species of the San Francisco Estuary: A field identification guide. Prepared for the San Francisco Estuary Invasive Spartina Project. (2006).
- Special Vascular Plants, Bryophytes, and Lichens List. Natural Diversity Data Base. January. http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPPlants.pdf (2009a)
- Changes to Special Vascular Plants, Bryophytes, and Lichens List. Natural Diversity Data Base. January. http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPPlants_Changes.pdf (2009b)
- State and Federally Listed Endangered, Threatened, and Rare Plants of California. Natural Diversity Data Base. October. http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEPlants.pdf (2009c)
- Angel Island Native Plant Checklist. Marin Chapter. April 4. (1993)

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[20] The CNPS has created five lists in an effort to categorize degrees of concerns, which include List 1A: Plants Presumed to Extinct in California; List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere; List 2: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere; List 3: Plants About Which We Need More Information - A Review List; and List 4: Plants of Limited Distribution - A Watch List. Additionally, the CNPS has developed a Threat Rank which is an extension added onto the CNPS List and designates the level of endangerment by a 1 to 3 ranking, with 1 being the most endangered and 3 being the least endangered. A Threat Rank is present for all List 1Bs, List 2s, and the majority of List 3s and List 4s. The categorization of plants under the CNPS is separate and legally distinct from the CESA and FESA. In addition, East Bay Chapter of the CNPS List A-ranked species are recommended for consideration under CEQA Guidelines when they occur in areas where development or land use changes are proposed.

- Inventory of Rare and Endangered Plants of California (sixth edition). Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. Sacramento, California. 388 pp. (2001)
- Rare Plants of San Francisco. List of Special Status Plants of the Presidio. Prepared by Peter Brastow. Yerba Buena Chapter. September 15. (2005a)
- Rare Plants of San Francisco. List of special status plants of San Francisco. September 15. (2005b)
- Inventory of Rare and Endangered Plants (online edition, v7-08d 10-05-08). San Francisco County search. California Native Plant Society. Sacramento, CA. Accessed on October 11, 2008. http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi. (2008)
- The Jepson Manual: Higher Plants of California. University of California Press, Berkeley, California. 1400 pp. (1993)
- Unusual and Significant Plants of Alameda and Contra Costa Counties. Seventh Edition. California Native Plant Society, East Bay Chapter. March 1. (2004)
- Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Conservancy Fairy Shrimp, Longhorn Fairy Shrimp, and the Vernal Pool Tadpole Shrimp; and Threatened Status for the Vernal Pool Fairy Shrimp. 50 C.F.R. part 17. September 19. (1994)
- Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species; Proposed Rule. 50 C.F.R. Part 17. Vol. 61(40): pp 7596–7613. February 28. http://www.epa.gov/fedrgstr/EPA-SPECIES/1996/February/Day-28/pr-10089.pdf. (1996)
- Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates or Proposed for Listing as Endangered or Threatened, Annual Notice of Findings on Recycled Petitions, and Annual Description of Progress on Listing Actions; Proposed Rule. 50 C.F.R. Part 17. Vol. 62 (182): 49398–49411. September 19. (1997)
- Endangered and Threatened Wildlife and Plants. 50 C.F.R. 17.11 & 17.12. December 31. (1998)
- Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants. January. http://www.fws.gov/ventura/es/protocols/botanicalsurvey_protocol.pdf. (2000)
- Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Species that are Candidates or Proposed for Listing as Endangered or Threatened, Annual Notice of Findings on Recycled Petitions, and Annual Description of Progress on Listing Actions; Proposed Rule. 50 C.F.R. Part 17. Vol. 66(210): pp 54808–54832. October 30. http://www.epa.gov/fedrgstr/EPA-SPECIES/2001/October/Day-30/e26982.htm. (2001)

- Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates or Proposed for Listing as Endangered or Threatened, Annual Notice of Findings on Recycled Petitions, and Annual Description of Progress on Listing Actions; Proposed Rule. 50 C.F.R. Part 17. Vol. 69 (86): 24876–24904. May 4. http://www.epa.gov/fedrgstr/EPA-SPECIES/2004/May/Day-04/e9893.htm. (2004)

- Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Oakland West and Eight Surrounding U.S.G.S. 7 1/2 Minute Quads and San Francisco County. Database Last Updated: April 29, 2010. Document Number: 100624034334. http://www.fws.gov/sacramento/es/spp_lists/auto_list_form.cfm (2010)

- Preliminary Checklist Of The Flora Of Yerba Buena Island, San Francisco County. January 16. (2007)

Based upon field surveys and review of the above-listed documents, 34 species special-status plant species were identified to have a low to moderate potential to occur on-site based on habitat availability and were included in focused botanical surveys conducted during spring and summer 2009 during the appropriate blooming periods (Figure 3.17-5; Table 3.17-2; NES, Appendix N). During focused botanical surveys, two of these species were observed in the BSA, stinging phacelia (*Phacelia malvifolia*) and large-flowered sand-spurrey (*Spergularia macrotheca* var. *macrotheca*). Survey methods and results are discussed in more detail in the botanical survey report (included in NES, Appendix N). The remaining target species were not found during focused surveys and are therefore presumed absent from the site; thus they are not discussed further. In addition, the project will avoid northern foredune, potential habitat for several of these target species.

LARGE FLOWERED SAND-SPURREY

Large flowered sand-spurrey is a stout, taprooted perennial herb in the pink family (Caryophyllaceae). The species is low-growing, from 5.1 to 35.6 centimeters (2 to 14 inches) tall, with fleshy leaves with sometimes conspicuous dull-white to tan, narrowly triangular stipules. The inflorescence is glandular hairy and the flowers are pink to rosy and can appear year-round. Large flowered sand-spurrey is found in salt flats and marshes, dunes, rocky outcrops, sandy or rocky coastal bluffs, gravelly ridges, and alkaline fields from Humboldt to San Diego counties and inland in Alameda and Contra Costa counties, from the coast inland to the Great Central Valley and the Mojave Desert.

Large flowered sand-spurrey has no official state or Federal status as a protected species but is an East Bay Chapter CNPS List A-2.

On YBI, large-flowered sand-spurrey was found during 2009 focused botanical surveys. It persists as dense clumps on otherwise barren sandstone, just above the high tide line and below the scrub vegetation, on the north side of the east point, immediately outside the project boundary. There are approximately 20 individuals within this location (Figures 3.17-6 and 3.17-7).

Source: CNDDB 2008

0 0.5 1 2 Miles

Figure 3.17-5
Special Status Species (Plants)

Table 3.17-2: Listed and Special-status Species Potentially Occurring or Known to Occur in the Project Area.

Common Name	Scientific Name	Status	Habitat Present/ Absent	Potential for Occurrence and Rationale	Survey Results and Project Effects
Plants					
Coast rock cress	*Arabis blepharophylla*	CNPS 4; YBCNPS	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Nuttall's milk-vetch	*Astragalus nuttallii* var. *nuttallii*	CNPS 4.2	HP	Very Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Coastal bluff morning-glory	*Calystegia purpurata* ssp. *saxicola*	CNPS 1B.2	HP	Moderate: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Franciscan thistle	*Cirsium andrewsii*	CNPS 1B.2; YBCNPS	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Compact cobwebby thistle	*Cirsium occidentale* var. *compactum*	CNPS 1B.2	HP	Very Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
San Francisco Bay spineflower	*Chorizanthe cuspidata* var. *cuspidata*	CNPS 1B.2; YBCNPS	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Robust spineflower	*Chorizanthe robusta* var. *robusta*	FE; CNPS 1B.1	HP	Very Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
San Francisco collinsia	*Collinsia multicolor*	CNPS 1B.2; YBCNPS	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Pt. Reyes bird's-beak	*Cordylanthus maritimus* ssp. *palustris*	CNPS 1B.2; YBCNPS	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Potential salt marsh habitat avoided by project. Would not be affected by project.

Common Name	Scientific Name	Status	Habitat Present/ Absent	Potential for Occurrence and Rationale	Survey Results and Project Effects
Western leatherwood	*Dirca occidentalis*	CNPS 1B.2	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
San Francisco wallflower	*Erysimum franciscanum*	CNPS 4.2; YBCNPS	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Fragrant fritillary	*Fritillaria liliacea*	CNPS 1B.2	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Dune gilia	*Gilia capitata* ssp. *chamissonis*	CNPS 1B.1; YBCNPS	HP	Moderate: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Potential northern foredune habitat avoided by project. Would not be affected by project.
Dark-eyed gilia	*Gilia millefoliata*	CNPS 1B.2	HP	Very Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
San Francisco gum-plant	*Grindelia hirsutula* var. *maritima*	CNPS 1B.2; YBCNPS	HP	Moderate: Suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Diablo helianthella	*Helianthella castanea*	CNPS 1B.2	HP	Very Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Short-leaved evax	*Hesperevax sparsiflora* var. *brevifolia*	CNPS 1B.2	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Kellogg's horkelia	*Horkelia cuneata* ssp. *sericea*	CNPS 1B.1; YBCNPS	HP	Very Low: Suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Beach layia	*Layia carnosa*	FE; SE; CNPS 1B.1	HP	Very Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Potential northern foredune habitat avoided by project. Would not be affected by project.

Common Name	Scientific Name	Status	Habitat Present/ Absent	Potential for Occurrence and Rationale	Survey Results and Project Effects
Large-flowered linanthus	*Leptosiphon grandiflorus*	CNPS 4.2	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Rose linanthus	*Leptosiphon rosaceus*	CNPS 1B.1	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
San Francisco lessingia	*Lessingia germanorum*	FE; SE; CNPS 1B.1; YBCNPS	HP	Very Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Potential northern foredune habitat avoided by project. Would not be affected by project.
Woolly-headed lessingia	*Lessingia hololeuca*	CNPS 3	HP	Very Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Coast lily	*Lillium maritimum*	CNPS 1B.1	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Slender trefoil	*Lotus formosissimus*	CNPS 4.2	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Mount Diablo cottonweed	*Micropus amphibolus*	CNPS 3.2	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Marsh microseris	*Microseris paludosa*	CNPS 1B.2	HP	Very Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Curly-leaved monardella	*Monardella undulata*	CNPS 4.2	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Stinging phacelia	*Phacelia malvifolia*	EBCNPS A2	HP	Detected: Suitable habitat present.	Will be permanently and temporarily affected by project.
Choris's popcorn-flower	*Plagiobothrys chorisianus* var. *chorisianus*	CNPS 1B.2	HP	Very Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.

Common Name	Scientific Name	Status	Habitat Present/ Absent	Potential for Occurrence and Rationale	Survey Results and Project Effects
Michael's rein orchid	*Piperia michaelii*	CNPS 4.2	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
San Francisco campion	*Silene verecunda* ssp. *verecunda*	CNPS 1B.2; YBCNPS	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Large flowered sand-spurrey	*Spergularia macrotheca* var. *macrotheca*	EBCNPS A2	HP	Detected adjacent to project construction area: Suitable habitat present.	Plants avoided during project construction. Measures will be implemented to avoid indirect effects of project.
Santa Cruz microseris	*Stebbinsoseris decipiens*	CNPS 1B.2	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
Beach starwort	*Stellaria littoralis*	CNPS 4; YBCNPS	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.
California seablite	*Suaeda californica*	FE; CNPS 1B.1; YBCNPS	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Potential northern foredune habitat avoided by project. Would not be affected by project.
Dune tansy	*Tanacetum camphoratum*	YBCNPS	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Potential northern foredune habitat avoided by project. Would not be affected by project.
Triquetrella	*Triquetrella californica*	CNPS 1B.2	HP	Low: Marginally suitable habitat present.	Presumed absent: Would have been detectable during focused surveys. Would not be affected by project.

Common Name	Scientific Name	Status	Habitat Present/ Absent	Potential for Occurrence and Rationale	Survey Results and Project Effects
Wildlife					
Invertebrates					
Sandy beach tiger beetle	*Cicindela hirticollis gravida*	CNDDB	HP	Very Low: Marginally suitable habitat – Northern Foredune - present in BSA. Nearest Occurrence: within 8 kilometers (5 miles) to the southwest.	Potential northern foredune habitat avoided by project. Would not be affected by project.
Monarch butterfly (overwintering)	*Danaus plexippus*	CNDDB	HP	Moderate: Suitable habitat present in BSA	Observed on-site. May be affected by project.
San Francisco lacewing	*Nothochrysa californica*	CNDDB	HP	Very Low: Marginally suitable habitat present in BSA. Nearest Occurrence: within 16 kilometers (10 miles) to the south	May be affected by project.
A leaf-cutter bee (*Gummifera* leaf-cutter bee)	*Trachusa gummifera*	CNDDB	HP	Very Low: Marginally suitable habitat present in BSA Nearest Occurrence: within 8 kilometers (5 miles) to the southwest.	May be affected by project.
Birds					
Cooper's hawk (nesting site only)	*Accipiter cooperii*	WL	HP	Moderate: Suitable habitat present in BSA Nearest Occurrence: within 16 kilometers (10 miles) to the northeast.	Nesting habitat may be affected by project.
Allen's hummingbird	*Selasphorus sasin*	CNDDB	HP	Moderate: Suitable habitat present in BSA.	Nesting habitat may be affected by project.
Alameda song sparrow	*Melospiza melodia pusillula*	SSC	HP foraging only	Moderate: Suitable foraging habitat present in BSA, but no breeding habitat present.	Reported on-site. Potential foraging habitat may be affected by project. No potential nesting habitat will be affected by project.

Common Name	Scientific Name	Status	Habitat Present/ Absent	Potential for Occurrence and Rationale	Survey Results and Project Effects
Bank swallow	*Riparia riparia*	ST	HP	Low: Suitable habitat present in BSA.	The species was not observed and the project will comply with MBTA to avoid impacts to nesting birds.
California least tern	*Sternula antillarum browni*	FE; SE/FP	A	Not Expected: No suitable nesting or foraging habitat in the project area, although potential to forage in waters of Bay adjacent to the site.	Would not be affected by project.
Golden eagle (nesting/wintering sites only)	*Aquila chrysaetos*	FP; WL	HP	Very Low: Marginally suitable habitat present in BSA Nearest Occurrence: within 8 kilometers (5 miles) to the east.	The species was not observed and the project will comply with MBTA to avoid impacts to nesting birds.
Great egret (nesting colony)	*Ardea alba*	CNDDB	HP	Moderate: Suitable habitat present in BSA.	The species was not observed and the project will comply with MBTA to avoid impacts to nesting birds.
Great blue heron (nesting colony)	*Ardea herodias*	CNDDB	HP	Moderate: Suitable habitat present in BSA.	The species was not observed and the project will comply with MBTA to avoid impacts to nesting birds.
Snowy egret (nesting colony)	*Egretta thula*	CNDDB	HP	Moderate: Suitable habitat present in BSA.	The species was not observed and the project will comply with MBTA to avoid impacts to nesting birds.
White-tailed kite (nesting sites)	*Elanus leucurus*	FP	HP	Moderate: Suitable habitat present in BSA Nearest Occurrence: within 8 kilometers (5 miles) to the north.	The species was not observed and the project will comply with MBTA to avoid impacts to nesting birds.
American peregrine falcon (nesting)	*Falco peregrinus anatum*	FP	HP	High: Suitable habitat present in BSA.	Documented nesting on both spans of SFOBB. The project will comply with MBTA to avoid impacts to nesting birds.
California gull (nesting colony)	*Larus californicus*	WL	HP	Moderate: Suitable habitat present in BSA.	The species was not observed and the project will comply with MBTA to avoid impacts to nesting birds.

Common Name	Scientific Name	Status	Habitat Present/ Absent	Potential for Occurrence and Rationale	Survey Results and Project Effects
Western gull	*Larus occidentalis*	MBTA	HP	Moderate: Suitable habitat present in BSA.	Nesting documented on western Span of SFOBB. The project will comply with MBTA to avoid impacts to nesting birds.
Black-crowned night heron (rookery)	*Nycticorax nycticorax*	CNDDB	HP	Moderate: Suitable habitat present in BSA.	Nearest Occurrence: Rookery on YBI 0.25 mile south of the BSA. The project will comply with MBTA to avoid impacts to nesting birds.
California brown pelican (overwintering)	*Pelecanus occidentalis californicus*	FP	HP	High: Suitable habitat present in BSA.	The project will comply with MBTA to avoid impacts to nesting birds.
Double-crested cormorant	*Phalacrocorax auritus*	WL	HP	High: Suitable habitat present in BSA.	The project will comply with MBTA to avoid impacts to nesting birds.
Mammals					
Western red bat	*Lasiurus blossevillii*	SSC	HP	Moderate: Marginally suitable habitat present in BSA.	Roosting habitat may be affected by project.
Hoary bat	*Lasiurus cinereus*	CNDDB	HP	Moderate: Suitable habitat present in BSA.	Roosting habitat may be affected by project.
Long-eared myotis bat	*Myotis evotis*	CNDDB	HP	Moderate: Suitable habitat present in BSA.	Roosting habitat may be affected by project.
Fringed myotis bat	*Myotis thysanodes*	CNDDB	HP	Moderate: Suitable habitat present in BSA.	Roosting habitat may be affected by project.
Long-legged myotis bat	*Myotis volans*	CNDDB	HP	Moderate: Suitable habitat present in BSA.	Roosting habitat may be affected by project.
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*	SSC	HP	Moderate: Suitable habitat present in BSA.	Roosting habitat may be affected by project.

Absent [A] - no habitat present and no further work needed. Habitat Present [HP] -habitat is, or may be, present. [CH] - project footprint is located within a designated CH unit but does not necessarily mean that appropriate habitat is present. Status: Federal Endangered (FE); Federal Threatened (FT); State Endangered (SE); State Threatened (ST); Fully Protected (FP); State Rare (SR); State Species of Special Concern (SSC); CDFG Watch List (WL); California Native Plant Society (CNPS); East Bay Chapter CNPS (EBCNPS); Yerba Buena Chapter CNPS (YBCNPS); Tracked by CNDDB (CNDDB); Federal Migratory Bird Treaty Act (MBTA).

Permanently Impacted		
	Stinging Phacelia	113 sq ft
Temporarily Impacted		
	Stinging Phacelia	215 sq ft
Not Impacted		
	Large flowered sand-spurrey	79 sq ft
	Stinging Phacelia	2,445 sq ft
	Stinging Phacelia (scattered)	34,869 sq ft
Study Area		

Source: CNDDB 2008

0 75 150 300 Feet

Figure 3.17-6
Alternative 2b Impacts to Special Status Plants

Source: CNDDB 2008

Figure 3.17-7
Alternative 4 Impacts to Special Status Plants

STINGING PHACELIA

Stinging phacelia is an annual herb in the waterleaf family (Hydrophyllaceae) with hairy/bristly foliage and flowers that may cause dermatitis when touched. The leaves are wide and lobed and the flowers are pale cream. Stinging phacelia grows to about 0.3 meter (1 foot) tall. It occurs on sandy or gravelly soils along the coast from Santa Barbara north to Oregon in redwood forest, mixed evergreen forest, closed-cone pine forest, and northern coastal scrub. It has been documented on YBI during previous botanical surveys (Preliminary Checklist Of The Flora Of Yerba Buena Island, San Francisco County. January 16, 2007).

Stinging phacelia is not listed nor on the statewide CNPS List. However, stinging phacelia is on the East Bay Chapter of the CNPS List A2, indicating that it is currently found in three to five regions of the two-county area (Lake 2004).[21]

Suitable habitat on-site includes non-native scrub/shrublands on sandy soil. Stinging phacelia was found within the BSA during focused botanical surveys. It exists as uncommon herbaceous understory within the mixed broadleaf conifer and eucalyptus woodland forest north and northwest of the hairpin turn where Macalla Road becomes North Gate Drive (Figures 3.17-6 and 3.17-7). Two proximal zones (within 61 meters [200 feet] of each other) located along the slope contour, for a total area of 0.35 hectare (0.86 acre), define the spatial extent of stinging phacelia.

3.17.3.3 Environmental Consequences

A cumulative impact assessment for plants is provided in Section 3.20.2.

LARGE FLOWERED SAND-SPURREY

Within the BSA, large flowered sand-spurrey is found on the north side of the east point as low clumps on a sparsely populated sandstone cliff, occurring just above the high tide line and below the scrub vegetation. This population is composed of approximately 20 individuals covering approximately 7 square meters (79 square feet). The plants are located outside of the proposed temporary and permanent impact areas for both Alternative 2b and Alternative 4 (Figures 6a and 6b). They are, however, located within 30.5 meters (100 feet) of the temporary disturbance areas and there is potential for incidental or indirect impacts during construction.

With implementation of avoidance and minimization measures, impacts to large flowered sand-spurrey are not anticipated.

Avoidance and minimization measures are defined in Section 3.17.3.4.

STINGING PHACELIA

Both project alternatives could cause temporary and permanent impacts to areas with stinging phacelia vegetation during construction (Figures 3.17-6 and 3.17-7). The total area of potential impact to stinging phacelia is provided below for each alternative:

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[21] The East Bay Chapter of the CNPS only covers Alameda and Contra Costa counties.

- Alternative 2b
  - 11 square meters (113 square feet) permanent and 20 square meters (215 square feet) temporary
- Alternative 4
  - 20 square meters (215 square feet) permanent and 11 square meters (113 square feet) temporary

With implementation of avoidance and minimization measures as well as implementation of, woodland habitat revegetation plan as described in Section 2.2.4 impacts to stinging phacelia are not anticipated. Stinging phacelia plants removed in permanent and temporary disturbance areas will be replanted.

Avoidance and minimization measures are defined in Section 3.17.3.4.

3.17.3.4 Avoidance, Minimization, and/or Mitigation Measures

STINGING PHACELIA

Stinging phacelia shall be avoided to the extent feasible by the chosen project alternative and protected during construction. Where avoidance is not feasible, compensatory measures shall be implemented.

Potential impacts during construction activities shall be avoided to the extent feasible by placement of exclusion fencing 3 meters (10 feet) from the perimeter of the stinging phacelia stands outside the temporary and permanent impact area. Contractor education shall be conducted, bright-colored ESA fencing and signage shall be implemented, and a construction monitor shall confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements shall be completed immediately.

Unavoidable impacts to stinging phacelia will be offset by implementation of a woodland habitat revegetation plan. Stinging phacelia plants removed in permanent and temporary disturbance areas will be replanted. Compensatory measures are not proposed.

LARGE FLOWERED SAND-SPURREY

Large flowered sand-spurrey shall be avoided to the extent feasible by the chosen project alternative and protected during construction.

Potential impacts during construction activities shall be avoided by placement of exclusion fencing 3 meters (10 feet) from the perimeter of the large flowered sand-spurrey stand outside the temporary and permanent impact area. Contractor education shall be conducted, bright-colored ESA fencing and signage shall be implemented, and a construction monitor shall confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements shall be completed immediately. Loss of individuals is not anticipated; therefore, compensatory measures are not proposed.

3.17.4 Animal Species

3.17.4.1 Regulatory Setting

Many state and Federal laws regulate impacts to wildlife. USFWS, the National Oceanic and Atmospheric Administration (NOAA) Fisheries, and CDFG are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under the CESA or FESA and those that are not covered under the Marine Mammal Protection Act. Marine mammals and species listed or proposed for listing as threatened or endangered are discussed in Section 3.17.5. All other special-status animal species are discussed here, including CDFG Fully Protected Species and Species of Special Concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations pertaining to wildlife relevant to the project include the following:

- NEPA
- Migratory Bird Treaty Act (MBTA)
- Fish and Wildlife Coordination Act
- Magnuson-Stevens Fishery Conservation and Management Act

State laws and regulations pertaining to wildlife relevant to the project include the following:

- CEQA
- Sections 1600–1603 of the Fish and Game Code
- Section 4150 and 4152 of the Fish and Game Code

3.17.4.2 Affected Environment

The following technical reports were consulted:

- Natural Environment Study: YBI Ramps Improvement Project. (2011b) [NES. Appendix N]
- Birds of North America. Dorling Kindersley. (2001)
- Freeze Protection of Overwintering Monarch Butterflies in Mexico: Critical Role of the Forest as a Blanket and an Umbrella. Ecological Entomology. 21, 107–116. (1996)
- Understanding and Misunderstanding the Migration of the Monarch Butterfly (Nymphalidae) in North America: 1857–1995. Journal of the Lepidopterists' Society. 49(4), 304–385. (1995)
- *Neotoma fuscipes*. Mammalian Species, 368, 1–10. (1991)

- California Natural Diversity Data Base. Database Query for the Briones Valley, Hunters Point, Oakland East, Oakland West, Richmond, San Francisco North, San Francisco South, San Leandro, and San Quentin's 7-½ minute Quads. October. (2008a)

- Draft Breeding Status of the California Least Tern at Alameda Point, Alameda, California, 2006. Unpublished draft report prepared for the U.S. Navy, U.S. Fish and Wildlife Service. Fremont, California. (2007)

- Breeding Status of the California Least Tern at Alameda Point, Alameda, California, 2007. Unpublished draft report prepared for the U.S. Navy, U.S. Fish and Wildlife Service. Fremont, California. February. (2008b)

- Yerba Buena Island Habitat Management Plan – Stakeholder Interview Background Information. And Appendix – Existing Habitats and Special-Status Species on Yerba Buena Island. July. (2008)

- Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish and wildlife. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P. R. Olofson, editor. San Francisco Bay Regional Water Quality Control Board, Oakland, California. (2008)

- Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3. (2011a)

- E-Mail Correspondence: Airborne Noise from Pile Driving. January 6. (2011b)

- Mammals of California. California Natural History Guides (Revised).University of California Press, Berkeley. 428 pp. (2004)

- Brown Pelican in Northern California and the Importance of the Roost at Alameda Naval Air Station. A report from A Scientific Symposium – Alameda Naval Air Station's Natural Resources and the Base Closure. Golden Gate Audubon Society and the College of Alameda. (1994)

- Amphibian and Reptile Species of Special Concern in California. California Department of Fish and Game Contract # 8023. Inland Fisheries Division, Rancho Cordova, California. (1994)

- Overwintering Monarch Butterflies in California: Past and Present. In: Malcolm, S. and M. Zalucki (Eds.) Biology and Conservation of the Monarch Butterfly. Natural History Museum of Los Angeles County. pp 335–344. (1993)

- Bird Monitoring Memo #365, Week of June 29 – July 3, 2009. Bay Bridge East Span Project. Prepared for Parsons Brinckerhoff. July 15. Available from: www.biomitigation.org. (2009)

- Metapopulations and Wildlife Conservation. Island Press. 429pp. (1996)

- *Cicindela hirticollis gravida* - LeConte, 1851 NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: December 2, 2008). (2008)

- GGRO's East Bay Cooper's Hawk Intensive Nesting Survey. Unpublished Report. Golden Gate Raptor Observatory. Sausalito, CA. 26 pp. http://www.ggro.org/CHINSforWeb.pdf. (2004)

- Presidio Water Recycling Project. Environmental Assessment. Chapter 3.4 Biological Resources. April. (2002)

- Bird Species of Special Concern in California: an Annotated List of Declining or Vulnerable Bird Species. California Department of Fish and Game, The Resources Agency. (1978)

- Treasure Island/Yerba Buena Island Redevelopment Plan Draft EIR. July 12. (2010)

- Mammalian Species of Special Concern in California. California Department of Fish and Game. Wildlife Management Division Administrative Report 86-1. 112 pp. (1986)

INVERTEBRATES

Based on a literature review, previous biological reports for projects on or near YBI or the SFOBB, and a familiarity with the fauna within the project region, Caltrans considered potential impacts to 26 special-status invertebrate species for the Draft EIR/EIS. Of these species, 22 are not expected to occur on-site due to a lack of suitable habitat, the fact that the project site lies outside of their range, and/or isolation from known populations (See NES, Appendix N). The four remaining special-status invertebrate species that have potential to occur within the BSA are discussed in further detail below (Table 3.17-2).

Sandy Beach Tiger Beetle

The sandy beach tiger beetle, (*Cicindela hirticollis gravida*) a species tracked by the California Natural Diversity Database (CNDDB), is a subspecies of *Cicindela hirticollis* tiger beetles. Cicindela tiger beetles are usually brownish-colored beetles with lighter patterned areas, ranging in size from 1.19 to 1.50 centimeters (0.47 to 0.59 inch) in length. They are found occupying moist sand near the ocean; for example, in swales behind dunes or upper beaches beyond normal high tides. They are generally a spring/fall species with a 1- or 2-year lifecycle, that had a historical distribution ranging along the immediate coast from north of San Francisco south slightly into Mexico. The sandy beach tiger beetle is now extirpated from most of the sites where it previously occurred (NatureServe 2008; USGS 2008).

On-site, the sandy beach tiger beetle is considered to have a very low potential to occur due to the availability of marginally suitable northern foredune habitat. The nearest known occurrence of the sandy beach tiger beetle is within 16 kilometers (10 miles) to the southwest.

Monarch Butterfly

The monarch butterfly, a species tracked by the CNDDB, is a large, familiar orange butterfly in the family Nymphalidae, or brush-footed butterflies. Monarchs are a migratory species, with successive generations making long-distance migrations to the same overwintering sites year after year. These overwintering sites occur in very specific microclimates that are vulnerable to human disturbance, particularly through the destruction or alteration of wind-protected, coastal tree groves. Upon hatching, monarch caterpillars feed on their hostplant, milkweed (*Asclepias* sp.), before pupating and becoming adults. Monarchs arrive at the coast and begin forming colonies in trees in late September (Lane 1993). They do not have persistent colony formations. Temporary colonies tend to break up in early October to early December and then disperse to other permanent sites where they will spend the winter. The date in which the colonies break up depends on the weather. In warmer, drier years, mating occurs earlier and colonies may break up as early as late January. In colder, wetter years, colony breakup can be delayed into March. Several generations may be produced during the spring and summer before adults begin their migration to overwintering sites. The adults mate just before leaving overwintering sites in mid- to late winter, and then disperse widely to areas where their host plant is present to lay eggs.

The western population of monarchs breeds in areas with milkweed throughout the United States west of the Rockies (Brower 1995), but virtually all of the overwintering sites used by the western population are located along the California coast, from northern Mendocino County south to San Diego County. Overwintering sites are almost always coastal, though small numbers of monarchs have been reported overwintering as far east as Inyo County (Lane 1993). Most sites are located within 0.8 kilometers (0.5-mile) of the coast, in areas of dense tree cover where the butterflies are protected from the wind. Typical overwintering sites are found near natural watercourses and include areas at or near sea level in shallow canyons, gullies, or the leeward side of hills, where a combination of dense tree canopy, vegetation cover, and local topography provides strong wind protection (Lane 1993). Dense canopy cover also provides insulation from cold temperatures and protection from winter rains, both of which can cause lethal freezing in monarchs (Anderson and Brower 1996). Although monarch overwintering sites do not receive specific protection under Federal or state laws, in many cases they are protected locally by city or county ordinances. They are also included on CDFG's special animal list with a conservation status rank of G5S3 (globally secure; subnationally vulnerable). CDFG tracks the locations of Monarch overwintering sites through the California Natural Diversity Data Base (CNDDB). Individual monarchs do not receive this consideration outside of overwintering sites. Other Federal projects in the City of San Francisco, such as the Presidio Recycled Water Project, have included mitigation measures to protect monarch butterfly overwintering sites (Presidio Trust 2002).

Two individual monarch butterflies were observed in flight during the site visit, within the BSA. Four reported monarch butterfly overwintering sites occur within 8 kilometers (5 miles) of the BSA, on Angel Island to the northwest, and within the city of San Francisco to the west (CDFG 2008a; Figure 3.17-8). Suitable habitat for overwintering monarchs is present among the tall, wind-protected trees within the eucalyptus woodland and mixed broadleaf conifer forest in the BSA (Figure 3.17-1). Based on the presence of suitable habitat and the known presence of individuals in the BSA, overwintering monarch butterflies are considered to utilize habitats within the BSA and have a moderate potential to roost within these habitats in the BSA.

Gummifera Leaf-Cutter Bee

The gummifera leaf cutter bee (*Trachusa gummifera*), a species tracked by the CNDDB, has been reported to use the leaves on rosebushes (Crenshaw 1997; Kulzer 1996) as well as a number of native and non-native plants for nest-building activities. The gummifera leaf cutter bee has been reported from San Francisco, San Mateo, and Marin counties. This species is included on CDFG's special animal list with a conservation status rank of G1S1 (critically imperiled globally and subnationally).

Although the nearest known occurrence is more than 8 kilometers (5 miles) to the southwest (CDFG 2008a), due to the presence of some potentially suitable plants within the landscaped portions of the BSA, including a row of roses, the gummifera leaf-cutter bee is considered to have a very low potential to occur on-site.

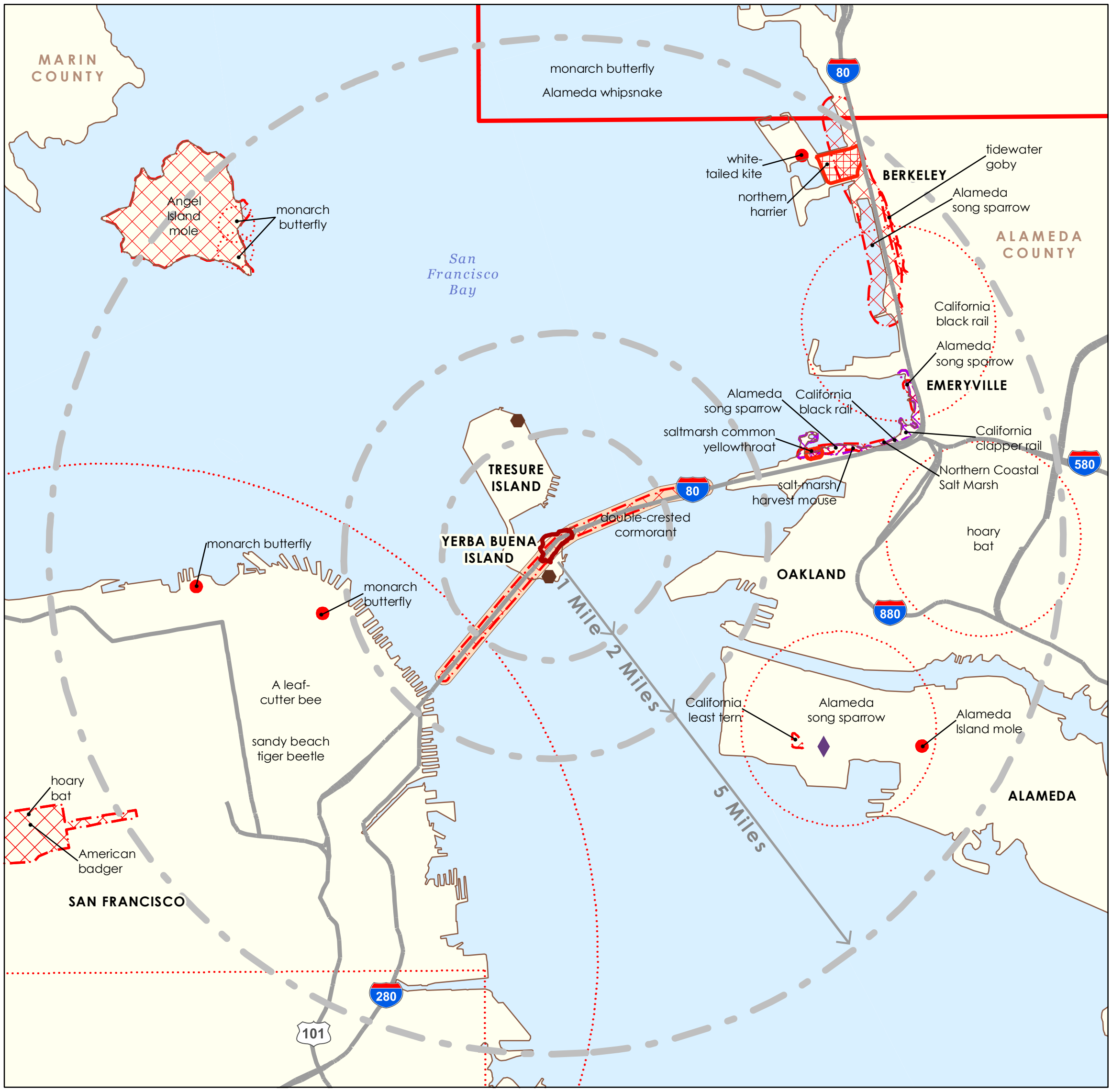
San Francisco Lacewing

The San Francisco lacewing (*Nothochrysa californica*), a species tracked by the CNDDB, inhabits moist woodlands near the coast with live oak, bay, or pine. They are included on CDFG's special animal list with a conservation status rank of G1S1S3 (critically imperiled globally; critically imperiled to vulnerable subnationally).

The nearest known occurrence of the San Francisco lacewing is more than 8 kilometers (5 miles away), to the southwest (CDFG 2008a). Due to the presence of marginally suitable habitat within the BSA, the San Francisco lacewing is considered to have a very low potential to occur.

FISH

Caltrans considered potential impacts to the Sacramento perch (*Archoplites interruptus*), a California Species of Special Concern, because the BSA falls within or in the vicinity of the historical range of this species. Although the BSA is located immediately adjacent to the Bay, which is considered Essential Fish Habitat for several fisheries, the only aquatic habitat present within the BSA is concrete-lined drainage swales adjacent to roadsides. These features are designed to convey storm water (therefore they are intermittent) and are unvegetated, ranging from 0.3 to 0.9 meters (1 to 3 feet) in width. They do not provide habitat for the Sacramento perch or other fish that have potential to occur in the adjacent waters of the Bay. Based on the absence of suitable aquatic habitat, the species is not expected to occur on-site (see NES, Appendix N). Implementation of BMPs for aquatic habitats as described in Section 3.17.2.4 would ensure that the fish species occurring in the Bay and their habitat is not indirectly affected by project construction activities.



Accuracy Class 1
Reported occurrence is a point; location considered accurate to within the minimum mappable unit of 80 meters

Accuracy Class 2
Reported location is an area with defined boundaries

Accuracy Class 3
Reported location is a non-specific area; buffer added to represent degree of uncertainty in reported location

Accuracy Class 4-9
Reported location considered accurate within the radius shown

Terrestrial Community (non-specific)

Study Area

Non-CNDDB Sensitive Species

Peregrine Falcon Nesting Site

Active Harbor Seal Haul Out Site

Burrowing Owl

SFOBB Bird Monitoring Memo, April, 2007; SFOBB Marine Mammal Monitoring Plan, May, 2002; Susan Euwing, personal communication, 2008

Source: CNDDB 2008

0 0.5 1 2 Miles

Figure 3.17-8
Special Status Species (Animals)

REPTILES AND AMPHIBIANS

Caltrans considered impacts to one special-status amphibian species and one special-status reptile species during the preparation of the Draft EIR/EIS because the BSA falls within or in the vicinity of the historical range of these species. These nonfederally or state-listed sensitive species include:

- Foothill yellow-legged frog (*Rana boylii*), a California Species of Special Concern
- Western pond turtle (*Actinemys* [=*Clemmys*] *marmorata*), a California Species of Special Concern

Both of these species were eliminated from consideration due to their range, isolation from known populations, or lack of suitable habitat. The BSA lacks freshwater aquatic habitat in the form of streams or ponds, making it unsuitable for foothill yellow legged frog and western pond turtle. The concrete-lined drainages are not considered suitable habitat for these species due to lack of cover, suitable substrate, and ponded water. The fact that YBI is an island also isolates it from all known populations of these species, as well as populations of Federally or state-listed amphibians and reptiles (Figure 3.17-8).

RAPTORS

Most raptors, such as golden eagle (*Aquila chrysaetos*), white-tailed kite (*Elanus leucurus*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), and Cooper's hawk (*Accipiter cooperii*), nest in mature, large coniferous or deciduous trees and use twigs or branches as nesting material. Smaller raptors such as American kestrel (*Falco sparverius*) and western screech-owl (*Otus kennicottii*) may nest in cavities in anthropogenic structures and trees. Short-eared owl (*Asio flammeus*), and northern harrier (*Circus cyaneus*), nest on the ground in grassland, marshes, and agricultural fields with tall vegetation. The American peregrine falcon (*Falco peregrinus anatum*) nests on cliff faces and in urban areas uses human-made structures. Western burrowing owl (*Athene cunicularia hypugaea*) typically nest in small mammal burrows in open dry lands but have been known to utilize any ground cavity of similar size as well as anthropogenic structures. Common raptors such as American kestrel, great horned owl (*Bubo virginianus*), common barn owl (*Tyto alba*), Cooper's hawk, and red-tailed hawk could nest on-site and are afforded protection under the MBTA (16 U.S.C. § 703–712) and the California Fish and Game Code §§ 355–357, 3503, 3503.5, and 3513). The nesting period for raptors generally occurs between December 15 and August 31.

Caltrans considered potential project impacts to seven special-status raptor species during the preparation of the Draft EIR/EIS because the BSA falls within or in the vicinity of the historical range of these species, including:

- Cooper's hawk, a CDFG Watch List species
- American peregrine falcon, (*Falco peregrinus anatum*), a California Fully Protected species
- Golden eagle, a CDFG Watch List species and California Fully Protected species
- Western burrowing owl, a California Species of Special Concern

- Northern harrier, a California Species of Special Concern
- White-tailed kite, a California Fully Protected species
- Osprey (*Pandion haliaetus*), a CDFG Watch List species

Four of these species are not expected to occur or nest on-site. Although the closest known occurrence of western burrowing owl is less than 6.4 kilometers (4 miles) to the southeast, on Alameda Island (Euing 2007, 2008a, 2008b) (Figure 3.17-8), based on the isolation of the island from suitable open habitat areas and lack of such habitat on-site, western burrowing owl is not expected to occur. Northern harrier has been reported to occur within 8 kilometers (5 miles) to the northeast of the BSA; however, due to a lack of open grassland, marsh, or agricultural habitats on-site, northern harrier is not expected to occur on-site. Osprey may occasionally forage in the Bay adjacent to the BSA, and although they are also known to nest on Bay Area watershed lands adjacent to reservoirs, they are not expected to use the BSA for nesting.

The bridge structure within and adjacent to the project area provides suitable nesting habitat for American peregrine falcon. The large trees within the eucalyptus woodland and mixed forest on-site including coastal redwood (*Sequoia sempervirens*), coast live oak (*Quercus agrifolia*), Monterey pine (*Pinus radiata*), eucalyptus (*Eucalyptus cinerera*), acacia (*Acacia* sp.), and canary palms (*Phoenix canariensis*) provide suitable nesting habitat for Cooper's hawk, white-tailed kite, and golden eagle as well as common raptor species such as red-tailed hawk and great horned owl. Large trees within landscaped areas also provide potential raptor nesting habitat. Refer to the NES in Appendix N for the potential for each of these species to occur on-site.

Because of the likelihood that they could occur on-site, American peregrine falcon, Cooper's hawk, golden eagle, and white-tailed kite are addressed in further detail below.

American Peregrine Falcon

The peregrine falcon is one of the most widely spread bird species, found on all continents except Antarctica. In California, the peregrine falcon is found year-round along the coast from the Oregon border south to Pt. Conception (Sibley 2003). Peregrine falcons require open areas for foraging, and for nesting use cliffs in isolated areas, or bridges and buildings in urban areas. Other potential but rare nest sites include abandoned nests of ravens, hawks, or cormorants. Peregrine falcons generally begin nesting in late March, laying between three and four eggs per clutch. Incubation lasts approximately 33 days, during which time the female incubates while the male forages and brings food back to the nest. Peregrine falcons will nest again if the first attempt is unsuccessful. The peregrine falcon is known for its high speed flight; it is a foraging specialist, feeding primarily on birds ranging in size from swallows to small ducks or pigeons, which it often catches in flight.

Listed in 1973 as an endangered species under the FESA, the peregrine was delisted in 1999 after a successful recovery program that included banning DDT and other chlorinated hydrocarbons, protection from shooting and trapping, and captive breeding. At its lowest, the population had been reduced to several hundred breeding pairs in the U.S., and only two of these nested in California in 1970. The population now numbers approximately 2,000 breeding pairs, with 271 active breeding sites known in California as of 2006 (SCPBRG 2009), and they were delisted under the CESA in 2009 although they remain a Fully Protected species (CDFG 2009).

Peregrine falcons have been known to nest in urban areas within the Bay Area, with pairs nesting in San Jose, Redwood Shores, and San Francisco. The peregrines in San Jose have nested on the city hall building in 2007, 2008, and 2009, and have successfully fledged three to four offspring each of those years. The peregrines in Redwood Shores nested on the roof of building 400 on the Oracle campus from 2000 to 2002 and again in 2007. In 2007 the Oracle peregrines successfully fledged four offspring. The peregrines in downtown San Francisco nested on the Pacific Gas and Electric (PGE) building from 2003 until 2005, successfully fledging two offspring in 2004 and three offspring in 2005. The peregrines that had nested on the PGE building in downtown San Francisco moved temporarily to an adjacent building in 2006, fledging a single offspring, and to the west span of the SFOBB in 2007 producing two viable eggs, which were collected and incubated by Santa Cruz Predatory Bird Research Group (SCPBRG) biologists. Of the two viable eggs, only one survived to fledging. In 2007, the peregrines returned to the PGE building for a second nesting attempt, which produced a second successful hatchling (SCPBRG 2009). A different pair of peregrines successfully nested at the PGE building in 2009. However, shortly after fledging, one fledgling was killed when it hit a skyscraper window, a second was severely injured and taken into captivity for rehabilitation, and the third disappeared and may have successfully left the area (SCPBRG 2009)

Peregrine falcons are known to nest on existing piers on the SFOBB (Woodward-Clyde 1998; USDT-FHWA 2001), and known peregrine nesting areas on the SFOBB are currently being monitored as part of the mitigation requirements for the SFOBB East Span Seismic Safety Plan (Final Revised Bird Monitoring and Management Plan: San Francisco –Oakland Bay Bridge East Span Seismic Safety Project, 2003). The peregrines nested on pier E3, located approximately 487.7 meters (1,600 feet) east of the BSA, in 2004 and 2007, and on pier E2, located approximately 79.2 meters (260 feet) east of the BSA, in 2005 and 2006 (Biological Monitoring and Mitigation Compliance Report (March, April and May), 2004, 2005, 2006, 2007, 2008). In 2004 and 2005 the nesting attempts failed, and no viable offspring were produced (Biological Monitoring and Mitigation Compliance Report (March, April and May), 2004, 2005). In 2006, a first nesting attempt in March failed; however, a second nesting attempt in June produced a single hatchling, which was removed from the nest by SCPBRG biologists on July 31 (Biological Monitoring and Mitigation Compliance Report (March, April and May), 2006). In 2007, the peregrines successfully hatched two eggs, which were removed from the nest by SCPBRG biologists on May 15. The falcons did not attempt to nest on the east span of the SFOBB in 2008. A pair of peregrine falcons nested and hatched two chicks on the west span of the SFOBB in April of 2008; however, the chicks did not successfully fledge. In May 2009, a pair of peregrine falcons successfully hatched three chicks at the pier E2 nesting site on the existing SFOBB. All three nestlings fledged in June of 2009. Two of the three juveniles were observed flying and roosting repeatedly on and around the existing and new bridge. The third juvenile was not observed since fledging on June 18, 2009 (Bird Monitoring Memo #365, Week of June 29 – July 3, 2009. Bay Bridge East Span Project. Prepared for Parsons Brinckerhoff. July 15, 2009).

While there are several structures within the BSA, none of them provide the cliff-like habitat preferred by peregrine falcons. Furthermore, the portion of the bridge structure within the BSA does not have the unobstructed views, or high ledges that would make it likely appealing to a nesting peregrine falcon. Therefore, it is unlikely that peregrine falcons would nest within the BSA. However, due to the proximity of known past nesting sites on the eastern span SFOBB columns, and the availability of adequate foraging habitat on-site, the peregrine falcon is considered to have a high potential to occur and forage on-site.

Cooper's Hawk

Cooper's hawk is a medium-sized raptor distributed year-round throughout California and much of the contiguous United States. Cooper's hawk occupies open forested areas, oak woodland, and riparian areas, nesting in conifers or deciduous trees. Primarily an ambush hunter, Cooper's hawks feed on small birds and mammals, and on occasion, fish (Alsop 2001). Cooper's hawks lay four to six eggs per year, with chicks hatching after 32 to 36 days. This species is found in residential areas in portions of the Bay Area, especially in the East Bay, where they are becoming increasingly common (Pericoli and Fish 2004). They have been known to hunt near houses, backyard ponds, and bird feeders.

The nearest known occurrence is approximately 8 kilometers (5 miles) to the east within the city of Oakland (CDFG 2008a). The common birds and mammals that occur on-site provide a potential prey base. Based upon the relative proximity to known occurrences and the suitable nest trees present within the landscaped areas, eucalyptus woodland, and mixed forest found on portions of the site, Cooper's hawk is considered to have a moderate potential to occur.

Golden Eagle

Golden eagle is a large raptor that is widely distributed throughout western North America. Primarily found in grasslands and open mountainous areas, golden eagles are solitary birds that nest on cliff ledges and tall trees, and feed primarily on small mammals. Golden eagles nest throughout the hills of the East Bay and prefer remote nest sites with a low level of human disturbance.

Large trees within the wooded portions of the site provide potential nesting habitat although these areas are adjacent to heavy and regular disturbances from SFOBB construction activities, boat, and bridge traffic. The nearest recorded occurrence is approximately 16 kilometers (10 miles) to the east (CDFG 2008a), and due to the ongoing site disturbances, golden eagle is considered to have a very low potential to occur.

White-Tailed Kite

White-tailed kite is a medium-sized raptor that is distributed across much of the western part of California. The white-tailed kite occupies low-elevation grassland, agricultural, wetland, oak woodland, and savanna habitats and nests in a wide variety of trees and shrubs, either isolated or in larger stands. Nearby open areas are required for foraging, including certain types of agricultural fields. Food habit studies have demonstrated that voles make up a large proportion of its diet, although other small mammals, birds, and insects are also preyed upon (Alsop 2001). This species hunts during the day primarily by hovering and searching for prey. White-tailed kites in California are generally resident, although they may occupy different areas during the nonbreeding and breeding seasons. Typically, four eggs are laid in February and March and chicks hatch after 30 to 32 days. Juveniles are dependent on parents for 2 to 3 months before they fledge. During the nonbreeding season, this species roosts communally.

Suitable nesting habitat for white-tailed kite is present within the mixed broadleaf conifer forest located on the northeast side of the BSA, and the closest documented occurrence is within 8 kilometers (5 miles) to the northeast (CDFG 2008a). With its placement up against the hillside, the forested area is somewhat buffered from the construction and traffic activity to the southwest. White-tailed kites are relatively tolerant of human disturbances if suitable trees are available for nesting providing adequate shelter, noise buffers, and wind protection. Trees within the forest are well developed with adequate limbs and canopy for nesting. Common rodents present on-site provide an adequate prey base. Therefore, white tailed kites are considered to have a moderate potential to occur on-site.

BIRDS (NONRAPTORS)

Passerines (perching birds) are a taxonomic grouping that consists of several families including swallows (Hirundinidae), larks (Alaudidae), crows, ravens and jays (Corvidae), shrikes (Laniidae), vireos (Vireonidae), finches (Fringillidae) and Emberizids (Emberizidae; warblers, sparrows, blackbirds, etc.), among others. Nonpasserine land birds are a nontaxonomic based grouping typically used by ornithologists to categorize a loose assemblage of birds. Families grouped into this category include kingfishers (Alcedinidae), woodpeckers (Picidae), swifts (Apodidae), hummingbirds (Trochilidae), and pigeons and doves (Columbidae), among others.

Shorebirds and water birds encompass species that are strongly dependent upon aquatic and wetland habitat, and include such families as loons (Gaviidae), grebes (Podicipedidae), pelicans (Pelecanidae), herons and egrets (Ardeidae), swans, geese and ducks (Anatidae), Gruiformes (Gruidae; cranes, Rallidae; rails, coots, moorhens), gulls (Laridae), nonsandpiper shorebirds (Charadriidae, Haematopodidae, Recurvirostridae; plovers, oystercatchers, stilts and avocets), and sandpipers (Scolopacidae).

Caltrans considered impacts to 24 nonraptor special-status bird species during the preparation of this Draft EIR/EIS because the BSA falls within or in the vicinity of the historical range of these species. Based on the location of the site (beyond the species current range) or absence of suitable habitat, 14 of these species are not expected to occur (see the NES in Appendix N). Several of these species, including the double-crested cormorant (*Phalacrocorax auritus*), a CDFG Watch List species, and California brown pelican (Pelecanus occidentalis californicus), a CDFG Fully Protected species, are discussed below in more detail.

Passerines and Nonpasserine Landbirds

Habitat, nesting, and foraging requirements for these species are wide ranging; therefore, outlining generic habitat requirements for this grouping is difficult. These species typically use most habitat types and are known to nest on the ground; in shrubs and trees; on buildings; under bridges; and within cavities, crevices, and human-made structures. Many of these species migrate long distances and all species except starlings, English house sparrows (*Passer domesticus)*, and rock doves (pigeons) (*Columba livia*), are protected under the Federal MBTA and Fish and Game Code. The nesting period for nonpasserines occurs between February 1 and August 31.

Mature woodlands and scrub communities provide ample nesting and foraging habitats for a wide variety of species including sparrows, scrub jays, crows, warblers, bushtits, and hummingbirds. Allen's hummingbird (*Selasphorus sasin*), a species tracked by the CNDDB, has a moderate potential to nest within natural and landscaped vegetation found throughout the BSA.

Several common passerine and nonpasserine landbird species could nest within habitats present on-site including natural vegetation, structures, and disturbed areas. Ruderal, disturbed, landscaped, and grassland areas could provide nesting habitat for such opportunistic birds, as well as foraging habitat for a wide variety of birds. Structures within the BSA such as the existing bridge structure provide potential nesting habitat for species such as house finch and barn swallow. Alameda song sparrow (*Melospiza melodia pusillula*), a California Species of Special Concern, nests in tidal marsh habitat and uses this habitat year-round. This species has been reportedly observed foraging on-site (USDT-FHWA 2001); however, this occurrence is not noted in the CNDDB, and there is no suitable nesting habitat within the BSA. Because the song sparrow subspecies are difficult to visually tell apart, except by habitat use and location, the song sparrow seen at YBI may have been the upland subspecies, not Alameda song sparrow. Therefore while Alameda song sparrow is considered to have a moderate potential to occur, it is not expected to nest within the BSA.

Shorebirds, Marshbirds, and Waterbirds

Suitable nesting and foraging habitat is present on-site for special-status wading birds found in nearshore habitats such as snowy egret (*Egretta thula*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), and black-crowned night-heron (*Nycticorax nycticorax*). Rookery sites of all of these species are tracked by the CNDDB. These species are considered to have a moderate potential to occur on-site. A small black-crowned night-heron rookery has been documented on a cliff face on the southern end of YBI, approximately 0.8 kilometers (0.25 mile) south of the BSA (Kelly et al. 2006). The eucalyptus woodland and mixed forest within the BSA provide potential roost and nesting habitat for these species. Great blue herons, great egrets, and double-crested cormorants often roost and nest in stands of non-native trees. In Santa Cruz County, these species have been reported to only nest in eucalyptus groves (Suddjian 2004).

The California gull (*Larus californicus*), a CDFG Watch List species, and western gull (*Larus occidentalis*), are both known to nest and forage within San Francisco Bay. A large group of California gulls is known to nest on Alameda Naval Air Station (Goals Project 2000) which is located approximately 3.2 kilometers (2 miles) to the east from the BSA, with nests numbering more than 100 in 1997. Western gulls have been reported to nest on the SFOBB structure near the Oakland touchdown (Biological Monitoring and Mitigation Compliance Report (July), 2002). While both of these species nest near the BSA, the proximity of the on-site portion of the bridge structure is unlikely to be attractive as a nesting site for western gulls due to its orientation over land as opposed to being over water. Moreover, California gulls are unlikely to nest within the BSA as there is no undisturbed open habitat that would support a colony. Both species of gulls could forage within the project area as they are opportunistic feeders that forage in areas with human garbage such as school yards and dumps (Goals Project 2000); therefore, they are considered to have a moderate potential to occur on-site. Additional foraging habitat for California gull and western gull is available adjacent to the BSA in shallow bay waters. This habitat is not likely to be impacted by project construction activities. Implementation of BMPs for aquatic habitats as described in Section 3.17.2.4

would ensure that gull fish prey in the Bay are not indirectly affected by project construction activities.

California Brown Pelican

The California brown pelican, which was recently delisted under ESA and CESA (CDFG 2009), occurs in estuarine, marine, subtidal, and marine pelagic waters from the Gulf of California north to Washington and southern British Columbia. They breed exclusively on islands from the Channel Islands off the coast of southern California south to islands off the coast of Baja California. When not breeding, California brown pelicans roost on the open ocean, offshore or mainland rocks, mudflats, sandy beaches, wharfs, and jetties throughout coastal California.

California brown pelicans are plunge divers that fly over water bodies scanning the surface for the shimmer of schooling fish. In California, they feed mainly on sardines (family Clupeidae), mackerels (family Scombridae), and anchovies (family Engraulididae). Pelicans breed in colonies on islands without mammalian predators along the Baja peninsula and in the Gulf of California in Mexico. They build nests of sticks on the ground, usually laying a clutch of three eggs in March or April.

Pelicans are present in the Bay Area as they disperse after breeding in southern California as early as April. By July, thousands of pelicans are seen and remain in the region through September. Pelicans usually retreat to the south by about December (Jaques-Strong 1994).

California brown pelicans utilize Breakwater Island (part of the former Naval Air Station, Alameda) east of the BSA as the “key roost in San Francisco Bay.” They congregate and roost on this disconnected island and use the surrounding waters to forage. At peak density there may be over 8,500 pelicans utilizing Breakwater Island, and hundreds are regularly present (Euing 2007).

Numerous brown pelicans have been observed foraging in the Bay near the BSA (Garcia and Associates 2008), and several pelicans were observed roosting on pilings in the Bay immediately adjacent to the site during the site reconnaissance survey. California brown pelicans have been observed immediately adjacent to the BSA and marginally suitable roosting habitat is present on the narrow sandy shoreline rimming the BSA and the small pier that is partially within the BSA; therefore, California brown pelicans are considered to have a high potential to roost within or immediately adjacent to the BSA. Brown pelicans are not expected to nest within the BSA, however, as they are only known to nest on Southern California coastal islands.

Double-Crested Cormorant

The double-crested cormorant is a common resident in waterways and water bodies throughout California. They may forage for fish at almost any significant water source, from ponds and streams to the open ocean. They nest on steep slopes, cliff faces, tall trees, and tall human-made structures such as transmission towers beside water.

During the site reconnaissance survey, double-crested cormorants were observed foraging in the Bay. Furthermore, double-crested cormorants are known to nest on bridges, including the Richmond-San Rafael Bridge (Wunderlich per. obs.) and the SFOBB (Woodward-Clyde 1998; USDT-FHWA 2001) and have been observed on YBI

(Yerba Buena Island Habitat Management Plan – Stakeholder Interview Background Information. And Appendix – Existing Habitats and Special-Status Species on Yerba Buena Island. July, 2008) (Figure 3.17-8). On the Richmond-San Rafael Bridge, cormorants generally nest below the roadway on the supporting steel structure and will roost nearby on the bridge structure as well as on any exposed rocks in the Bay. Based on the presence of suitable roosting habitat such as exposed columns, piers, and rocks immediately adjacent to the eastern edge of the BSA, and their known presence in the vicinity, double-crested cormorant are considered to have a high potential to roost within the BSA and a low potential to nest within the bridge structure on-site.

TERRESTRIAL MAMMALS

Potential impacts to 15 special-status terrestrial mammal species were considered during the preparation of this Draft EIR/EIS because of the presence of occurrences nearby, or because the BSA falls within or in the vicinity of the historical range of these species, including:

- Pallid bat (*Antrozous pallidus*), a California Species of Special Concern
- Berkeley kangaroo rat (*Dipodomys heermanni berkeleyensis*), a species tracked by the CNDDB
- Silver-haired bat (*Lasionycteris noctivagans*), a species tracked by the CNDDB
- Western red bat (*Lasiurus blossevillii*), a California Species of Special Concern
- Hoary bat (*Lasiurus cinereus*), a species tracked by the CNDDB
- San Pablo vole (*Microtus californicus sanpabloensis*), a species tracked by the CNDDB
- Long-eared myotis bat (*Myotis evotis*), a species tracked by the CNDDB
- Fringed myotis bat (*Myotis thysanodes*), a species tracked by the CNDDB
- Long-legged myotis bat (*Myotis volans*), a species tracked by the CNDDB
- San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), a California Species of Special Concern
- Angel Island mole (*Scapanus latimanus insularis*), a California Species of Special Concern
- Alameda Island mole (*Scapanus latimanus parvus*), a California Species of Special Concern
- Salt marsh wandering shrew (*Sorex vagrans halicoetes*), a California Species of Special Concern
- American badger (*Taxidea taxus*), a California Species of Special Concern

- Point Reyes jumping mouse (*Zapus trinotatus orarius*), a California Species of Special Concern

Based on the absence of suitable salt marsh habitat and isolation from known occurrences (Figure 3.17-8), salt marsh wandering shrew is not expected to occur within the BSA. YBI is isolated from known occurrences and populations of San Pablo vole, Point Reyes jumping mouse, Angel Island mole, Alameda island mole, American badger, and Berkeley kangaroo rat by the waters of the Bay (CDFG 2008a) (Figure 3.17-8), and therefore these species are not expected to occur (see the NES in Appendix N). Special-status terrestrial mammal species that have potential to occur on-site are discussed in more detail below.

Special-Status Bats

There are 24 known species of bats in California. Of those, 11 are classified as California Species of Special Concern (CDFG 2008c). Five special-status bat species have a moderate potential to occur within the BSA, including western red bat, hoary bat, long-eared myotis bat, fringed myotis bat, and long-legged myotis bat.

These species variously use mature trees, snags, crevices, and human-made structures (such as buildings) for roosting, either for winter roosting (hibernacula) or for forming nursery colonies. Bats are generally site faithful and will not abandon an established roosting area unless disturbed.

Several species of bats have a potential to use structures and trees on-site for roosting. Structures such as the existing bridge roadway structure, between the YBI landing and YBI tunnel, have crevices and nooks that provide potential refuge for bats as temporary night roosts. Additionally, there are several uninhabited buildings within the BSA that could provide adequate day and night roosting habitat in gaps beneath roof tiles or exterior trim, or within the structures themselves, and several potential access points for bats to enter and leave these structures were identified. The BSA also contains stands of mature trees, which could provide roosting habitat within the canopy, cavities in the trees, or beneath loose bark. Foraging habitat is available throughout the BSA, wherever insects may congregate, such as near nighttime light sources.

An acoustical bat survey was conducted as part of the biological resources analysis for the Treasure Island/Yerba Buena Island Redevelopment Project by ESA in 2009. Calls recorded overnight on two occasions indicated that Mexican free-tailed bats (*Tadarilia brasiliensis*) are the predominant species present on the island (City of San Francisco 2010). However, the survey was not exhaustive and other species that may be considered special-status were not ruled out.

San Francisco Dusky Footed Woodrat

The San Francisco dusky-footed wood rat is a medium-sized rat that builds large stick nests at the bases of trees and shrubs. These nests average 116.8 centimeters (46 inches) high and contain multiple chambers and openings (Carraway 1991). This species prefers forested habitat with a moderate to complete canopy cover and brushy understory and is often found on the upper banks of riparian forests. However, wood rats will also nest in chaparral, coastal sage-scrub, and mixed coniferous forests (Carraway 1991). Nesting locations are determined based on a combination of dark, cool surroundings; low to moderate humidity; and dense cover (Linsdale 1957). San

Francisco dusky-footed wood rats feed on a variety of woody plants, fungi, flowers, and seeds (Jameson and Peeters 2004) but prefer evergreen vegetation high in fiber, tannins, and polyphenolics such as oaks, California bay, alders, willows, coffeeberry, toyon, coyote brush, and Douglas fir, among others (Atsatt and Ingram 1983; Carraway 1991). Home ranges average 0.2 hectare (0.5 acre) with males having slightly larger home ranges, all of which overlap from 15% to 62% depending on breeding activity (Carraway 1991).

Wood rats are commonly preyed on by weasels, coyotes, bobcats, and rattlesnakes as well as several raptors such as barn owls, great horned owls, and red-tailed hawks (Carraway 1991). Most notably, wood rats are the preferred prey of the Northern spotted owl. Wood rats and their nests provide food and cover for a wide range of species including parasitic mouse (*Peromyscus californicus*), deer mouse (*Peromyscus maniculatus*), harvest mouse (*Reithrodontomys megalotis*), ornate shrew (*Sorex ornatus*), brush rabbit (*Sylvilagus bachmani*), western fence lizard (*Sceloporus occidentalis*), garter snake (*Thamnophis* spp.), California whipsnake (*Masticophis lateralis*), gopher snake (*Pituophis melanoleucus*), ensatina (*Ensatina eschscholtzii*), California slender salamander (*Batrachoseps attenuatus*), and California newt (*Taricha torosa*), among others (Carraway 1991).

Thick understory beneath the eucalyptus and mixed broadleaf woodland canopies composed of ivy, as well as small acacia and other shrubby plants, provides potential habitat for San Francisco dusky-footed woodrat. Although no San Francisco dusky-footed woodrat houses were observed during the site visit, these structures can be quite cryptic, the site provides ample material for the building of these structures, and San Francisco dusky-footed woodrats have been known to build houses in stands of eucalyptus, such as those found on-site. They have also been observed using eucalyptus leaves as food and nest-making material (Hodge 2008). Therefore, San Francisco dusky-footed woodrat are considered to have a moderate potential to occur on-site.

3.17.4.3 Environmental Consequences

A cumulative impact assessment for animal species was conducted including invertebrates, raptors, birds, and terrestrial mammals, which is provided in Section 3.20.2.

INVERTEBRATES

Sandy Beach Tiger Beetle

Sandy beach tiger beetle has the potential to occur in northern foredune habitat adjacent to the project construction area. As described in Section 3.17.3, the project would employ avoidance measures for the northern foredune community, which lies outside of the proposed permanent and temporary construction footprint for both alternatives. Thus impacts to potential sandy beach tiger beetle habitat are not anticipated.

Monarch Butterfly

Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest (Figures 3.17-3 and 3.17-4), which provide potential habitat for monarch butterfly. The total area of potential impact to this habitat is small for each alternative:

- Alternative 2b
    - eucalyptus woodland = 0.10 hectare (0.25 acre) permanent, 0.36 hectare (0.90 acres) temporary
    - mixed broadlead conifer forest = 0.28 hectare (0.70 acre) permanent, 0.38 hectare (0.95 acre) temporary
- Alternative 4
    - eucalyptus woodland = 0.08 hectare (0.19 acre) permanent, 0.50 hectare (1.24 acres) temporary
    - mixed broadleaf conifer forest = 0.13 hectare (0.32 acre) permanent, 0.53 hectare (1.32 acres) temporary

Gummifera Leaf-Cutter Bee

Both build alternatives would have potential temporary and permanent impacts to landscaped/disturbed areas (Figures 3.17-3 and 3.17-4), which may provide potential habitat for gummifera leafcutter bee, including rosebushes. The total area of potential impact to this habitat is small for each alternative:

- Alternative 2b
    - landscaped/disturbed = 0.04 hectare (0.09 acre) permanent, 0.09 hectare (0.23 acre) temporary
- Alternative 4
    - landscaped/disturbed = 0.07 hectare (0.18 acre) permanent, 0.06 hectare (0.14 acre) temporary

San Francisco Lacewing

Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest (Figures 3.17-3 and 3.17-4), which provide potential habitat for San Francisco lacewing. The total area of potential impact to this habitat is small for each alternative:

- Alternative 2b
    - eucalyptus woodland = 0.10 hectare (0.25 acre) permanent, 0.36 hectare (0.90 acre) temporary
    - mixed broadlead conifer forest = 0.28 hectare (0.70 acre) permanent, 0.38 hectare (0.95 acre) temporary

- Alternative 4
  - eucalyptus woodland = 0.08 hectare (0.19 acre) permanent, 0.50 hectare (1.24 acres) temporary
  - mixed broadleaf conifer forest = 0.13 hectare (0.32 acre) permanent, 0.53 hectare (1.32 acres) temporary

FISH

Project construction activities that involve loud equipment such as pile driving have the potential to cause barotrauma to fish species occurring within waters adjacent to the site. However, none of these activities will occur within aquatic habitats. All construction activities, including pile driving of piers for installation of the ramps, will occur on land in soils that are not saturated. H-piles (steel piles) will be driven into the ground; the other type of piles to be used are concrete piles which are to be placed, not driven (a hole is augered and the concrete is placed inside). The closest H-piles will be driven approximately 91.4 meters (300 feet) from the shoreline under Alternative 2b and 27.4 meters (90 feet) from the shoreline under Alternative 4. The primary source of underwater noise would be ground borne vibration released into the bay. The measurement criteria used for noise is decibel (dB). The underwater noise measurement unit is referred to as “dB re: 1µPa”. A hydro-acoustic analysis for pile driving activities under both project alternatives was prepared (Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3, 2011a). Predictions for distances to adopted NMFS, USFWS, and CDFG (FHWG 2008) injury threshold criteria were made using actual measurements taken from similar pile driving experiences. Injury threshold criteria for fish are as follows:

- Peak Sound Pressure, unweighted (dB)

  206 dB re: 1µPa (for all size of fish)

- Cumulative Sound Exposure Level (SEL), dB re 1 µPa2 sec

  187 dB re: 1µPa2-sec – for fish size of two grams or greater.

  183 dB re: 1µPa2-sec – for fish size of less than two grams.

NMFS does not consider events that produce a SEL per strike of less than 150 dB to accumulate and cause injury. The data used in this analysis is based primarily on data measured for installation of a temporary crane platform on YBI in November 2008. Therefore soil types and transmission loss through the soils would be similar to the project area, providing a reasonable comparison. For the crane platform, piles were driven approximately 12.2 meters (40 feet) from the water’s edge producing maximum underwater sound levels of 174 dB peak and 147 dB SEL at underwater measurement locations of 39.9 meters (131 feet). This was the closest location that measurements could be made due to the shallowness of the water. The closest pile for Alternative 4 is located 27.4 meters (90 feet) from the shoreline. Given that this pile will be farther away from fisheries habitat than those installed for the crane platform, underwater noise levels are expected to be even lower for construction of the YBI Ramps under both alternatives. Thus, project construction noise levels are not expected to reach the minimum established injury threshold of 183 dB SEL or 206 dB peak for fish (Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3, 2011a).

The project is designed so that construction activities are located an adequate distance from the bay and therefore fish would be not be affected by construction activities. Construction noise levels, including pile driving, would be well below established thresholds to avoid potential injury to fish located in aquatic habitats adjacent to the site.

RAPTORS

American Peregrine Falcon

Project construction activities have the potential to disturb peregrine falcons that attempt nesting within the project area and those that may be nesting adjacent to the site. Construction-related noise and vibration could potentially impact the success of nests that are within line of sight or near enough to disturb the normal activities of the adult birds.

Cooper's Hawk

Project construction activities have the potential to disturb Cooper's hawks that attempt nesting within the project area and those that may be nesting adjacent to the site. Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest. The total area of potential impact to woodland and forest habitat is small for each alternative:

- Alternative 2b
    - woodland and forest habitat = 0.38 hectare (0.95 acre) permanent, 0.75 hectare (1.85 acres) temporary
- Alternative 4
    - woodland and forest habitat = 0.20 hectare (0.51 acre) permanent, 1.04 hectares (2.56 acres) temporary

Golden Eagle

Project construction activities have the potential to disturb golden eagles that attempt nesting within the project area and those that may be nesting adjacent to the site. Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest. Removal of trees would result in a loss of potential golden eagle nesting habitat:

- Alternative 2b
    - woodland and forest habitat = 0.38 hectare (0.95 acre) permanent, 0.75 hectare (1.85 acres) temporary

- Alternative 4
  - woodland and forest habitat = 0.20 hectare (0.51 acre) permanent, 1.04 hectares (2.56 acres) temporary

White-Tailed Kite

Project construction activities have the potential to disturb white-tailed kites that attempt nesting within the project area and those that may be nesting adjacent to the site. Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest. Removal of trees would result in a loss of potential white-tailed kite nesting habitat:

- Alternative 2b
  - woodland and forest habitat = 0.38 hectares (0.95 acre) permanent, 0.75 hectare (1.85 acres) temporary
- Alternative 4
  - woodland and forest habitat = 0.20 hectare (0.51 acre) permanent, 1.04 hectares (2.56 acres) temporary

BIRDS (NONRAPTORS)

Passerines and Nonpasserine Landbirds

Special-status passerine and nonpasserine landbird species, including bank swallow and Allen's hummingbird, have the potential to nest within the BSA. The remaining special-status bird species, as well as other common bird species that may nest on-site could be temporarily disturbed or unable to nest due to construction activity. Permanent removal of existing structures is not anticipated to have a long-term effect on habitat availability as the project would create new structures providing additional habitat for nesting birds such as house finches and swallows.

Both build alternatives would have potential temporary and permanent impacts to landbird nesting habitat, including central coast riparian scrub, eucalyptus woodland, landscaped/disturbed, mixed broadleaf conifer forest, non-native scrub/shrubland, northern foredune, and ruderal/disturbed habitat:

- Alternative 2b
  - central coast riparian scrub, eucalyptus woodland, landscaped/disturbed, mixed broadleaf conifer forest, non-native scrub/shrubland, and ruderal/disturbed = 0.43 hectare (1.07 acres) permanent, 1.17 hectare (2.88 acres) temporary
- Alternative 4
  - central coast riparian scrub, eucalyptus woodland, landscaped/disturbed, mixed broadleaf conifer forest, non-native scrub/shrubland, and

ruderal/disturbed = 0.36 hectare (0.89acre) permanent, 1.32 hectares (3.27 acres) temporary

Shorebirds, Marshbirds, and Waterbirds

Project construction activities have the potential to disturb wading bird species that nest in mature woodlands, such as egrets and herons that attempt nesting within the project area and those that may be nesting adjacent to the site. Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest. Removal of trees would result in a loss of potential nesting habitat:

- Alternative 2b
  - woodland and forest habitat = 0.38 hectare (0.95 acre) permanent, 0.75 hectare (1.85 acres) temporary
- Alternative 4
  - woodland and forest habitat = 0.20 hectare (0.51 acre) permanent, 1.04 hectare (2.56 acres) temporary

California Brown Pelican

California brown pelican has the potential to occur within the BSA and roost on piers and the sandy shoreline just outside the temporary and permanent project construction areas. Temporary disturbance to roosting pelicans could occur if construction activities encroach upon occupied roosting habitat. No permanent impacts to potential roosting areas are anticipated as the project construction footprint would avoid the piers in the Bay and the shoreline, including the northern foredune community.

Double-Crested Cormorant

Double-crested cormorants have the potential to occur within the BSA. Construction activities on or adjacent to the existing bridge structure could potentially disturb nesting cormorants and cause nest failure or abandonment. Construction activities along the eastern border of the BSA could potentially temporarily disturb roosting cormorants, if construction activities move outside of the construction envelope. The project would have no permanent impact on cormorant roosting, nesting, or foraging habitat.

TERRESTRIAL MAMMALS

Special-Status Bats

Project construction activities have the potential to directly affect bats roosting within the project area and indirectly disturb those that may be roosting adjacent to the site. Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest that provide potential roost sites. Removal of trees would result in a loss of potential bat roosting habitat:

- Alternative 2b
    - woodland and forest habitat = 0.38 hectare (0.95 acre) permanent, 0.75 hectare (1.85 acres) temporary. Alternative 2b would require removal of one unoccupied building that provides potential roost habitat. In addition, the bridge structure and portions of the road way would be disturbed and modified during construction which may result in a loss of potential roost sites.
- Alternative 4
    - woodland and forest habitat = 0.20 hectare (0.51 acre) permanent, 1.04 hectare (2.56 acres) temporary. No buildings are proposed for removal under Alternative 4.

San Francisco Dusky Footed Woodrat

Project construction activities have the potential to directly affect woodrats if they occur within the project area and indirectly disturb those that may be utilizing woodlands and/or forests adjacent to the site. Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest that provide potential habitat. Removal of vegetation would result in a loss of potential foraging and nesting habitat:

- Alternative 2b
    - woodland and forest habitat = 0.38 hectare (0.95 acre) permanent, 0.75 hectare (1.85 acres) temporary
- Alternative 4
    - woodland and forest habitat = 0.20 hectare (0.51 acre) permanent, 1.04 hectare (2.56 acres) temporary

3.17.4.4 Avoidance, Minimization, and Mitigation Measures

INVERTEBRATES

Sandy Beach Tiger Beetle

Exclusion fencing will be placed around sandy dune habitats and contractor education will be conducted to prevent encroachment of construction activities.

Impacts to potential sandy beach tiger beetle habitat are not anticipated. In addition, the potential habitat within the BSA is considered marginal and the species has a very low potential to be present based on habitat quality and lack of occurrences in the vicinity. Compensatory measures are not proposed.

Monarch Butterfly

Prior to the onset of construction activities, a qualified biologist would conduct focused surveys for monarch butterfly to determine presence or absence within the proposed project areas. If monarch butterfly winter roost sites are determined to be present during focused surveys, occupied habitat would be avoided to the extent feasible, or it would be disturbed outside of the winter roost season, which is typically from September through March. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new roost site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures before construction resumes in the area.

Removal of eucalyptus woodland and mixed broadleaf conifer forest habitat that may provide roost sites for monarch butterfly will be offset by implementation of the woodland habitat revegetation plan described in Section 2.2.4. Trees removed will be replaced to provide potential habitat that may benefit the species longer term. Compensatory measures are not proposed.

Gummifera Leaf-Cutter Bee

Prior to the onset of construction activities, a qualified biologist would conduct focused surveys for gummifera leaf-cutter bee to determine presence or absence within the proposed project areas. If any gummifera leaf-cutter bees are determined to be present during focused surveys, occupied habitat would be avoided to the extent feasible. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If the species is discovered during construction, the biological monitor would be contacted to implement avoidance procedures before construction resumes in the area.

Removal of vegetation that may provide habitat for the gummifera leaf-cutter bee will be offset by implementation of the revegetation plan described in Section 2.2.4. Vegetation removed, including non-native trees, will be replaced, providing potential habitat that may benefit the species longer term if it occurs in the area. Compensatory measures are not proposed.

San Francisco Lacewing

Prior to the onset of construction activities, a qualified biologist would conduct focused surveys for San Francisco lacewing to determine presence or absence within the proposed project areas. If any individuals are determined to be present during focused surveys, occupied habitat would be avoided to the extent feasible. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If the species is discovered during construction, the biological monitor would be contacted to implement avoidance procedures before construction resumes in the area.

Removal of eucalyptus woodland and mixed broadleaf conifer forest habitat that may provide habitat for San Francisco lacewing will be offset by implementation of the woodland habitat revegetation plan described in Section 2.2.4. Trees removed will be replaced, providing potential habitat that may benefit the species longer term. Compensatory measures are not proposed.

FISH

The project is designed so that construction activities are located an adequate distance from the bay and therefore fish would be not be affected by construction activities. Construction noise levels, including pile driving, would be well below established thresholds to avoid potential injury to fish located in aquatic habitats adjacent to the site.

The project would not result in the loss of any Essential Fish Habitat and therefore compensatory measures are not proposed.

RAPTORS

American Peregrine Falcon

Peregrine falcons have the potential to nest in proximity to the BSA and have a high potential to use the BSA for foraging. Construction activities within the vicinity of active raptor nests could result in nest abandonment, nest failure, or premature fledging. Destruction or disturbance of active nests would be in violation of the MBTA and Fish and Game Code. In addition, peregrines are protected under CESA. Therefore, the following minimization measures would be implemented to avoid project-related impacts to potentially nesting peregrine falcons:

1. Throughout project construction, monitoring of the potential peregrine falcon nest sites on the columns of the existing SFOBB would be continued following the methodology outlined in the Final Revised Bird Monitoring and Management Plan (LSA 2003).

2. If removal of structures occurs, or construction begins between December 15 and August 31 (the nesting season), a nesting bird survey would be performed by a qualified biologist within 15 days prior to the removal of potential nesting structures, or prior to disturbance of areas in the vicinity of potential nest sites.

3. If an active peregrine falcon nest is discovered on the bridge or other structures within the project area or within 457.2 meters (1,500 feet) of the project area boundary, a nondisturbance buffer zone would be established in coordination with CDFG as necessary. Contractor education would be conducted by a qualified biologist for nesting bird avoidance. Observations would be conducted by a qualified biologist to confirm that work occurring outside of the buffer zone is not disturbing the nesting pair. If necessary, buffer zones would be adjusted to reduce distress to birds.

4. CDFG would be consulted for clearance before construction activities resume within the buffer zone.

5. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area.

No compensatory measures are proposed for this species.

Cooper's Hawk, Golden Eagle, White-tailed Kite, and Other Nesting Raptors

Cooper's hawks, golden eagle, white-tailed kite, and common raptor species such as red-tailed hawk have the potential to nest within habitats on-site. Any removal of trees, buildings, or other structures, or construction activities within the vicinity of active raptor nests could result in nest abandonment, nest failure, or premature fledging. Destruction or disturbance of active nests would be in violation of the MBTA and Fish and Game Code. Therefore, the following minimization measures would be implemented to avoid project-related impacts to potentially nesting raptors, in coordination with CDFG:

1. To the extent feasible, potential nest trees will be avoided.

2. To the extent feasible, the necessary removal of any trees or structures would occur from September 1 through December 15, outside the breeding season. If removal of trees or structures occurs, or construction begins between December 15 and August 31 (the nesting season), a nesting bird survey would be performed by a qualified biologist within 15 days prior to the removal of potential nesting trees or structures, or prior to disturbance of areas in the vicinity of potential nest sites.

3. All trees or structures with active nests would be flagged and a nondisturbance buffer zone established around the nest site in coordination with CDFG. Additionally, if any nests are found on the bridge or other structures within the project area or within 152.4 meters (500 feet) of the project area boundary, these nests shall be flagged and a nondisturbance buffer zone established. Buffer zones typically range between 61 and 152.4 meters (200 and 500 feet) depending on the species involved, site conditions, nesting stage, and type of work in proximity. Contractor education would be conducted for nesting bird avoidance. Observations would be conducted by a qualified biologist to confirm that work occurring outside of the buffer zone is not disturbing nesting pairs. If necessary, buffer zones would be adjusted to reduce distress to birds.

4. Active nests would be regularly monitored by a qualified biologist in coordination with CDFG to determine when the young have fledged and are feeding on their own. CDFG would be consulted for clearance before construction activities resume within the buffer zone. CDFG will be notified if any nest is disturbed.

5. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures, in coordination with CDFG, before construction resumes in the area.

Temporarily disturbed woodland and forested areas will be restored after completion of construction activities. Removal of eucalyptus woodland and mixed broadleaf conifer forest habitat that may provide nest sites for Cooper's hawk will be offset by implementation of the woodland habitat revegetation plan described in Section 2.2.4. Trees removed will be replaced with natives to the island. Compensatory measures are not proposed.

BIRDS (NONRAPTORS)

Passerines and Nonpasserine Landbirds

Several special-status and common passerine and nonpasserine landbirds, listed above, have at least some potential to nest and forage on-site. Any removal of structures, trees, or shrubs, or construction activities in the vicinity of active nests could result in nest abandonment, nest failure, or premature fledging. Destruction or disturbance of active nests would be in violation of the MBTA and Fish and Game Code. In addition, due to its Fully Protected status under Fish and Game Code, incidental take of individuals or nests is not authorized. Therefore, the following minimization measures would be implemented to avoid project-related impacts to potentially nesting passerine and nonpasserine landbirds, in coordination with CDFG:

1. The removal of any structures, trees, or shrubs would occur from September 1 through February 1, outside the passerine and nonpasserine landbird breeding season. If removal of trees or shrubs occurs, or construction begins between February 1 and August 31 (the nesting season), a nesting bird survey would be performed by a qualified biologist within 15 days prior to the removal of potential nesting structures, trees, or shrubs, or prior to disturbance of areas in the vicinity of potential nest sites, i.e., trees and shrubs.

2. All active nests would be flagged and a nondisturbance buffer zone established around the nesting tree (or other nesting substrate) in coordination with the CDFG. Buffer zones for passerines and nonpasserine land birds typically range between 15.2 and 27.4 meters (50 and 90 feet) depending on the species involved, site conditions, and type of work proposed in the vicinity. Contractor education would be conducted for nesting birds, including a discussion of avoidance and protection measures.

3. Active nests would be monitored by a qualified biologist in coordination with CDFG to determine when the young have fledged and are feeding on their own. The project biologist would be consulted for clearance before construction activities resume in the vicinity.

4. If a new nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures, in coordination with CDFG, before construction resumes in the area.

No compensatory measures are proposed for these species.

Shorebirds, Marshbirds, and Waterbirds

Suitable nesting and foraging habitat is present on-site for several species of wading birds, including snowy egret, great blue heron, great egret, and black-crowned night-heron. Therefore, the following minimization measures would be implemented to avoid project-related impacts to potentially nesting birds, in coordination with CDFG:

1. The removal of any structures, trees, or shrubs would occur from September 1 through February 1, outside the breeding season. If removal of trees or shrubs occurs, or construction begins between February 1 and August 31 (the nesting season), a nesting bird survey would be performed by a qualified biologist within 15 days prior to the removal of potential nesting structures, trees, or shrubs, or prior to disturbance of areas in the vicinity of potential nest sites, i.e., trees and shrubs.

2. All active nests would be flagged and a nondisturbance buffer zone established around the nesting tree in coordination with the CDFG. Buffer zones for wading birds typically range between 30.5 and 61 meters (100 and 200 feet) depending on the species involved, site conditions, and type of work proposed in the vicinity. Contractor education would be conducted for nesting birds, including a discussion of avoidance and protection measures.

3. Active nests would be monitored by a qualified biologist in coordination with CDFG to determine when the young have fledged and are feeding on their own. The project biologist would be consulted for clearance before construction activities resume in the vicinity.

4. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new nest or roost site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area.

Temporarily disturbed woodland and forested areas will be restored after completion of construction activities. Removal of eucalyptus woodland and mixed broadleaf conifer forest habitat that may provide nest sites for waterbirds such as herons and egrets will be offset by implementation of the woodland habitat revegetation plan described in Section 2.2.4. Trees removed will be replaced with natives to the island. Compensatory measures are not proposed.

California Brown Pelican

California brown pelicans have a high potential to roost adjacent to the construction envelope. Construction activities immediately adjacent to their roosting habitat could cause disturbance or flushing of individuals. Therefore, the following minimization measure would be implemented to avoid project-related impacts to California brown pelican, in coordination with CDFG:

1. Exclusion fencing would be placed around the construction footprint to prevent construction equipment from entering areas where the pelicans may roost. Contractor education would be conducted, including a discussion of avoidance and protection measures. A construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new roost site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area.

No compensatory measures are proposed due to the lack of permanent impacts.

Double-Crested Cormorant

Double-crested cormorants have potential to nest and forage on-site. Construction activities on or adjacent to the existing bridge structure or the eastern border of the BSA could potentially disturb cormorants. Therefore, the following minimization measures are recommended to avoid project-related impacts to double-crested cormorants, in coordination with CDFG:

1. Throughout project construction, monitoring of the potential cormorant nest sites on the existing SFOBB would be continued following the methodology outlined in the Final Revised Bird Monitoring and Management Plan (2003).

2. If construction activities begin between February 1 and August 31 (the nesting season), a nesting bird survey of the on-site bridge structure would be performed by a qualified biologist within 15 days prior to onset of construction to ensure that no cormorants have begun to nest in the structure or within 61 meters (200 feet) of the project disturbance footprint.

3. All active nests would be flagged or mapped and a nondisturbance buffer zone established around the nest in coordination with the CDFG. Buffer zones typically range between 30.5 and 61 meters (100 and 200 feet) for wading and waterbirds depending on the species involved, site conditions, and type of work proposed.

4. Active nests would be monitored by a qualified biologist in coordination with CDFG to determine when the young have fledged and are feeding on their own. CDFG would be consulted for clearance before construction activities resume.

5. Exclusion fencing would be placed around the construction footprint to prevent construction equipment for entering areas where the cormorants may roost. A construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately.

6. If a new roost or nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area.

No compensatory measures are proposed for this species.

TERRESTRIAL MAMMALS

Special-Status Bats

A preconstruction survey for roosting bats would be performed by a qualified biologist within 30 days prior to any removal of trees or structures on the site. If no active roosts are found, then no further action would be proposed. If either a maternity roost or hibernacula (structures used by bats for hibernation) is present, the following minimization measures would be implemented:

1. If active maternity roosts or hibernacula are found in trees or structures that would be removed or disturbed as part of project construction, the roost would be avoided by construction activities to the extent feasible. If an active maternity roost is located and avoidance of the occupied tree or structure is not feasible, demolition can commence before maternity colonies form (i.e., prior to March 1) or after young are volant (flying) (i.e., after July 31). Disturbance-free buffer zones as determined by a qualified biologist in coordination with CDFG would be observed during the maternity roost season (March 1 through July 31).

2. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new roost site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures before construction resumes in the area.

3. If a non-breeding bat hibernacula is found in a tree or structure scheduled for removal, the individuals would be safely evicted, under the direction of a qualified biologist (as determined by possession of a Memorandum of Understanding [MOU] with CDFG, typically amended to the individual's scientific collecting permit), by opening the roosting area to allow airflow through the cavity. Demolition can then follow at least one night after initial disturbance for airflow. This action should allow bats to leave during darkness, thus increasing their chance of finding new roosts with a minimum of potential predation during daylight. Trees or structures with roosts that need to be removed would first be disturbed at dusk, just prior to removal that same evening, to allow bats to escape during the darker hours.

If special-status bats are found roosting within trees or structures on-site that require removal or if occupied habitat is accidentally damaged during construction, appropriate replacement roosts shall be created at a 1:1 ratio at a suitable location on-site or off-site in coordination with a qualified biologist, Caltrans and/or CDFG.

San Francisco Dusky Footed Woodrat

A preconstruction survey for San Francisco dusky-footed woodrat and associated woodrat houses would be performed by a qualified biologist within 30 days prior to any removal of trees or other vegetation on the site and within 30.5 meters (100 feet) of planned construction activities. If no active houses are found, then no further action would be proposed. If active woodrat houses are found in or below trees and vegetation that would be removed or temporarily disturbed as part of project construction, the project would be redesigned to avoid the loss of the occupied habitat and disturbance to woodrats to the extent feasible. If the project cannot be redesigned to avoid removal of the occupied habitat, the woodrat house may be relocated to a suitable location as close to the original house as possible while maintaining an adequate buffer of construction activities in coordination with CDFG. Animal exclusion fencing would be placed around the construction area, to prevent woodrat ingress, and contractor education would be conducted. A construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area.

If San Francisco dusky-footed woodrat houses are found within portions of the project site that require permanent or temporary disturbance or if occupied habitat is accidentally damaged during construction, appropriate replacement houses/nests would be created at a 1:1 ratio at a suitable location on-site or off-site in coordination with a qualified biologist, Caltrans, and/or CDFG. Follow-up monitoring efforts would be conducted to evaluate relocation success and additional measures may be proposed if relocated houses are not successful.

3.17.5 Threatened and Endangered Species

3.17.5.1 Regulatory Setting

The primary Federal law protecting threatened and endangered species is FESA: 16 U.S.C., Section 1531, et seq. (see also 50 C.F.R. Part 402). This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, Federal agencies, such as FHWA, are required to consult with USFWS and NOAA Fisheries to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion or an incidental take permit. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, CESA, California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. CDFG is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game

Code as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFG. For projects requiring a Biological Opinion under Section 7 of FESA, CDFG may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

The Marine Mammal Protection Act (MMPA) of 1972 establishes a Federal responsibility for the protection and conservation of marine mammal species by prohibiting the harassment, hunting, capture, or killing of any marine mammal. The primary authority for implementing the act belongs to the USFWS and NOAA-Fisheries.

3.17.5.2 Affected Environment

The following technical reports were consulted:

- Natural Environment Study: YBI Ramps Improvement Project. (2011b) [NES. Appendix N].
- Selected tidal marsh plant species of the San Francisco Estuary: A field identification guide. Prepared for the San Francisco Estuary Invasive *Spartina* Project. (2007)
- Sacramento: Reintroduction of *Suaeda californica* (C*alifornia* sea-blite) to Historic San Francisco Bay Habitat. Online Fish and Wildlife Journal. (2007)
- State and Federally Listed Endangered and Threatened Animals of California. Natural Heritage Division, Natural Diversity Data Base. October. http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEAnimals.pdf (2008b)
- Draft Breeding Status of the California Least Tern at Alameda Point, Alameda, California, 2006. Unpublished draft report prepared for the U.S. Navy, U.S. Fish and Wildlife Service. Fremont, California. (2007)
- Breeding Status of the California Least Tern at Alameda Point, Alameda, California, 2007. Unpublished draft report prepared for the U.S. Navy, U.S. Fish and Wildlife Service. Fremont, California. February. (2008b)
- Memorandum of Understanding signed by NOAA’s Fisheries, U.S. Fish and Wildlife Service, California Department of Fish and Game, U.S. Federal Highway Administration, and the California/Washington/Oregon Departments of Transportation. June 12. (2008)
- Bank Swallow (*Riparia riparia*). In The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/riparian_v-2.html (1998)
- Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3. (2011a)
- E-Mail Correspondence: Airborne Noise from Pile Driving. January 6. (2011b)

- Brown Pelican in Northern California and the Importance of the Roost at Alameda Naval Air Station. *A report from A Scientific Symposium – Alameda Naval Air Station's Natural Resources and the Base Closure*. Golden Gate Audubon Society and the College of Alameda. (1994)

- Ecology, Assemblage Structure,Distribution, and Status of Fishes in Streams Tributary to the San Francisco Estuary, California. San Francisco Estuary Institute. Contribution No. 530 April. (2007)

- *Inland Fishes of California*. University of California Press, Berkeley, California. 517p. (2002)

- Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Oakland West and Eight Surrounding U.S.G.S. 7 1/2 Minute Quads and San Francisco County. Database Last Updated: April 29, 2010. Document Number: 100624034334. http://www.fws.gov/sacramento/es/spp_lists/auto_list_form.cfm [NES. Appendix N]. (2010)

Based on an absence of suitable habitat and isolation from know populations in the region, terrestrial species listed under the FESA are not expected to occur on-site. Aquatic species falling under the purview of the USFWS are not expected to occur in waters adjacent to the site. Therefore, it has been determined that the project will have no effect on Federally listed species regulated by the USFWS.

Based on the Alternative 2b project design which avoids sensitive aquatic habitats, restricts pile driving to a minimum of 91.4 meters (300 feet) from the shoreline and implements BMPs, this alternative will have no effect on fisheries or marine mammals. Alternative 4 will also implement BMPs and avoid direct impacts to aquatic habitats however it will involve pile driving within 27.4 meters (90 feet) of the shoreline. It is also anticipated that this alternative will have no effect on fisheries or marine mammal behavior patterns in the area based on the hydroacoustical analysis.

Proposed avoidance and minimization measures will reduce potential project impacts to species listed under the CESA that occur in the vicinity of the project area or have potential to occur on-site including the bank swallow. Bank swallow have not been documented on YBI however, the project has been designed to avoid impacts to potential habitat within the BSA and a pre-construction survey will be conducted for nesting birds prior to construction to avoid take of any individuals. Thus a 2081 permit from CDFG will not be necessary.

3.17.5.3 Environmental Consequences

Caltrans conducted a cumulative impact assessment for animal species including invertebrates, raptors, birds, and terrestrial mammals, which is provided in Section 3.20.2.

PLANT SPECIES

Based upon initial field surveys and review of the above-listed documents, four endangered or threatened plant species (beach layia, San Francisco lessingia, California seablite, and robust spineflower) were identified to have a low to moderate potential to occur on-site based on habitat availability and were included in the focused botanical surveys conducted during spring and summer 2009 during the appropriate blooming periods (Figure 3.17-5; Table 3.17-3; NES in Appendix N). Because these target species were not found during focused surveys and are therefore presumed absent from the site, the project will have no effect on listed plant species and they are not discussed further.

FISH

Potential project impacts to eight Federally or state-listed fish species were considered during the preparation of the Draft EIR/EIS because the BSA is located near the shoreline which is in the vicinity of the historical range of these species, including:

- Green sturgeon – southern Distinct Population Segment (DPS) (*Acipenser medirostris*), Federally listed threatened and a California Species of Special Concern
- Tidewater goby (*Eucyclogobius newberryi*), Federally listed endangered and a California Species of Special Concern
- Delta smelt (*Hypomesus transpacificus*), Federally and state-listed threatened
- Longfin smelt (*Spirinchus thaleichthys*), state-listed threatened
- Coho salmon – Central California ESU (Evolutionarily Significant Unit) (*Oncorhynchus kisutch*), Federally and state-listed endangered
- Steelhead – Central California Coast ESU (*Oncorhynchus mykiss*), Federally listed threatened
- Steelhead – Central Valley California ESU, Federally listed threatened
- Chinook salmon – Central Valley spring-run ESU (*Oncorhynchus tshawytcha*), Federally and state-listed threatened
- Chinook salmon – winter-run ESU, Federally and state-listed threatened

Leidy (2007) and Moyle (2002) consider the tidewater goby to be extirpated from San Francisco Bay and its tributaries. Delta smelt rarely occur in central or South San Francisco Bay and are normally restricted to areas north of San Pablo Bay (Moyle 2002). Critical habitat for Sacramento River winter-run Chinook, Central Valley spring-run Chinook, Central Coast coho, Central Valley steelhead is located in the Bay adjacent to the north side of the BSA. Furthermore, EFH is located in the Bay adjacent to the BSA for winter-run Chinook, Central Valley spring-run Chinook, Central Valley fall-run Chinook, late fall-run Chinook, and Central Coast coho (USDT-FHWA 2001; City and County of San Francisco 2006). Critical habitat for California coastal steelhead is also located to the south of the BSA. Although the BSA is located immediately adjacent to the Bay, the only aquatic habitat present within the BSA is concrete-lined drainage swales adjacent to roadsides. These features are designed to convey storm water (therefore they are intermittent) and are about 0.91-meter (3 feet) wide and unvegetated. They do not provide habitat for the special-status fish species that have potential to occur in the adjacent waters of the Bay. Based on the absence of suitable aquatic habitat, no fish species are expected to occur on-site (see the NES in Appendix N). Implementation of BMPs for aquatic habitats during construction as described in Section 3.17.2.4 will minimize potential water quality impacts to waters of the Bay and avoid indirect impacts to critical habitat and Essential Fish Habitat adjacent to the site.

Project construction activities that involve loud equipment such as pile driving have the potential to cause barotrauma to fish species occurring within waters adjacent to the site. However, none of these activities will occur within aquatic habitats. All construction activities, including pile driving of piers for installation of the ramps, will occur on land in soils that are not saturated. H-piles (steel piles) will be driven into the ground; the other type of piles to be used are concrete piles which are to be placed, not driven (a hole is augered and the concrete is placed inside). The closest H-piles will be driven approximately 91.4 meters (300 feet) from the shoreline under Alternative 2b and 27.4 meters (90 feet) from the shoreline under Alternative 4. The primary source of underwater noise would be ground borne vibration released into the bay. A hydro-acoustic analysis for pile driving activities under both project alternatives was prepared (Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3, 2011a). Predictions for distances to adopted NMFS, USFWS, and CDFG (HFWG 2008) injury threshold criteria were made using actual measurements taken from similar pile driving experiences. Injury threshold criteria for fish are as follows:

- Peak Sound Pressure, unweighted (dB)

  206 dB re: 1µPa (for all size of fish)

- Cumulative Sound Exposure Level (SEL), dB re 1 µPa2 sec

  187 dB re: 1µPa2-sec – for fish size of two grams or greater.

  183 dB re: 1µPa2-sec – for fish size of less than two grams.

NMFS does not consider events that produce a SEL per strike of less than 150 dB to accumulate and cause injury. The data used in this analysis is based primarily on data measured for installation of a temporary crane platform on YBI in November 2008. Therefore soil types and transmission loss through the soils would be similar to the project area, providing a reasonable comparison. For the crane platform, piles were driven approximately 40 feet from the water’s edge producing maximum underwater sound levels of 174 dB peak and 147 dB SEL at underwater measurement locations of 131 feet. This was the closest location that measurements could be made due to the shallowness of the water. The closest pile for Alternative 4 is located 90 feet from the shoreline. Given that this pile will be farther away from fisheries habitat than those installed for the crane platform, underwater noise levels are expected to be even lower for construction of the YBI Ramps under both alternatives. Thus, project construction noise levels are not expected to reach the minimum established injury threshold of 183 dB SEL or 206 dB peak for fish (Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3, 2011a). The project will have no effect on listed fish species.

REPTILES AND AMPHIBIANS

Potential project impacts to two amphibian species and six reptile species that are Federally or state-listed were considered during the preparation of the Draft EIR/EIS because the BSA falls within or in the vicinity of the historical range of these species. These include:

- California tiger salamander (*Ambystoma californiense*), Federally and state-listed threatened
- California red-legged frog (*Rana* [=*aurora draytonii*] *draytonii*), Federally listed threatened and a California Species of Special Concern
- Loggerhead turtle (*Caretta caretta*), Federally listed threatened
- Green turtle (*Chelonia mydas*), Federally listed threatened
- Leatherback (*Dermochelys coriacea*), Federally listed endangered
- Olive ridley sea turtle (*Lepidochelys olivacea*), Federally listed threatened
- Alameda whipsnake (*Masticophis lateralis euryxanthus*), Federally and state-listed threatened
- San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), Federally and state-listed endangered and a California Fully Protected Species

Of these eight species, all were eliminated from consideration due to their range, isolation from known populations, or lack of suitable habitat. The BSA lacks freshwater aquatic habitat in the form of streams or ponds, making it unsuitable for California tiger salamander, California red-legged frog, and San Francisco garter snake. The concrete-lined drainages are not considered suitable habitat for these species due to lack of cover, suitable substrate, and ponded water. The fact that YBI is an island also isolates it from all known populations of these species, as well as populations of Alameda whipsnake (Figure 3.17-8). The four species of sea turtle range very widely throughout the Pacific and other oceans, are typically found far out to sea during migrations, forage in suitable nearshore habitats, and lay their eggs on suitable beaches. Sea turtles do not nest in California, and although they may occur in coastal waters, sea turtles are not expected to enter the San Francisco Bay. There are no reported observations in the Bay and higher quality foraging opportunities are present in coastal waters and lagoons outside of the Bay. Therefore, they are not expected to occur within the waters adjacent to the project area (see the NES in Appendix N). Because none of the reptile or amphibian species listed above have potential to occur on or in the vicinity of the site, the project will have no effect on listed reptiles or amphibians.

RAPTORS

Potential project impacts to one state-listed endangered raptor species were considered during the preparation of the Draft EIR/EIS because the BSA falls within or in the vicinity of the historical range of this species:

- Bald eagle (*Haliaeetus leucocephalus*), state-listed endangered and a California Fully Protected species

The nearest reported occurrence of bald eagle is more than 8 kilometers (5 miles) away (CDFG 2008a). Bald eagle pairs have recently established nest sites on watershed lands adjacent to Bay Area reservoirs including Calaveras, Del Valle, and San Pablo; however, they are not known to nest in trees or structures adjacent to the Bay, preferring lands with minimized human activity. Therefore, bald eagles are not expected to occur on-site (see the NES in Appendix N). Because this species is not expected to occur on or in the vicinity of the site, the project will have no effect on bald eagle.

BIRDS (NONRAPTORS)

Passerines and Nonpasserine Landbirds

Several common passerine and nonpasserine landbird species could nest within habitats present on-site including natural vegetation, structures, and disturbed areas. Ruderal, disturbed, landscaped, and grassland areas could provide nesting habitat for such opportunistic birds, as well as foraging habitat for a wide variety of birds. Exposed vertical banks found on the northern boundary of the BSA provide potential nesting habitat for species such as bank swallow (*Riparia riparia*), a state-listed threatened species, which excavate tunnel nests into exposed sandbanks. Nesting bank swallows have not been recorded at YBI and the closest known nest colony is located approximately 14.5 kilometers (9 miles) southwest at Fort Funston/Lake Merced (Garrison 1998). The vertical banks that provide potential nesting habitat for bank swallow would be avoided; therefore, impacts to this species are not anticipated. The project will comply with MBTA to avoid impacts to nesting birds, therefore the project will have no effect on listed species.

Shorebirds, Marshbirds, and Waterbirds

Birds that inhabit salt marsh habitats of the Bay and require dense vegetation for shelter and nesting including black rail (*Laterallus jamaicensis coturniculus*), state-listed threatened and a California Fully Protected species, and California clapper rail (*Rallus longirostris obsoletus*), Federally and state-listed endangered and a California Fully Protected species, are not expected to occur on-site. Although they are known to occur within 8.05 kilometers (5 miles) (Figure 3.17-8), no suitable marsh habitat is present within the boundaries of the BSA for these species. Because these species are not expected to occur on-site, the project will have no effect on California black rail or California clapper rail.

The California least tern (*Sterna antillarum browni*), Federally and state-listed endangered and a California Fully Protected species, western snowy plover (*Charadrius alexandrinus nivosus*), Federally-listed threatened and a California species of special concern, and other sensitive beach nesting birds are not expected to nest on-site due to an absence of suitable habitat. These species nest on protected sand dunes, beaches, or other open but sheltered habitats adjacent to water. Northern foredune habitat on-site is minimal (0.178 hectare [0.440 acre]) and exposed to wave action, making it unsuitable for nest establishment and the remainder of the site is unsuitable due to ongoing construction or dense vegetation; therefore California least tern and western snowy plover are not expected to occur on-site. Foraging habitat for California least tern is available adjacent to the study area in shallow bay waters and occurrences have been recorded in the region (Figure 5). California least tern foraging habitat is not expected to be impacted by project construction activities given the avoidance of tidal aquatic habitat by project features and construction activities. For both alternatives, the tidal waters of the Bay will be avoided by temporary construction features and permanent project features, and will not be affected by temporary construction activities as standard construction BMP’s will be implemented to treat and minimize discharge into the Bay. Implementation of BMP’s as described in Section 3.17.2.4 for aquatic habitats will minimize the potential for least tern prey items (fish in the Bay) to be indirectly affected by project construction activities. Because this species is not expected to occur on-site, and because construction BMPs will reduce the potential for indirect effects to foraging habitat, it is expected that the project will have no effect on California least tern, western snowy plover, or any other listed bird species.

TERRESTRIAL MAMMALS

Potential project impacts to the salt marsh harvest mouse (*Reithrodontoyms raviventris*), a Federally and state-listed endangered and a California Fully Protected Species, was considered during the preparation of the Draft EIR/EIS because of the presence of occurrences nearby, or because the BSA falls within or in the vicinity of the historical range of this species. However, based on the absence of suitable salt marsh habitat and isolation from known occurrences and no connectivity (Figure 3.17-8), this species is not expected to occur within the BSA, and therefore the project will have no effect on salt marsh harvest mouse.

MARINE MAMMALS

Potential project impacts to nine Federally listed marine mammal species were considered during the preparation of the Draft EIR/EIS because the BSA falls within or in the vicinity of the historical range of these species or the species have been identified as occurring near the BSA, including:

- Guadalupe fur seal (*Arctocephalus townsendi*), Federally and state-listed threatened and a California Fully Protected Species
- Sei whale (*Balaenoptera borealis*), Federally listed endangered
- Blue whale (*Balaenoptera musculus*), Federally listed endangered
- Finback whale (*Balaenoptera physalus*), Federally listed endangered
- Southern sea otter (*Enhyrda lutris nereis*), Federally listed threatened and a California Fully Protected Species
- Right whale (*Eubalaena glacialis*), Federally listed endangered
- Stellar sea lion (*Eumetopias jubatus*), Federally listed threatened
- Humpback whale (*Megaptera novaeangliae*), Federally listed endangered
- Sperm whale (*Physeter catadon*), Federally listed endangered

Several species of Federally listed marine mammals occur off of the Central California Coast. However, only the humpback whale has been known to enter the San Francisco Bay on occasion and it is not expected to occur in the vicinity of the project area. If a humpback whale were to move into waters of the Bay, implementation of construction BMPs for adjacent aquatic habitats as described in Section 3.17.2.4 would minimize the potential for indirect effects. Given that it is extremely unlikely for them to be present in San Francisco Bay, the project will have no effect on Federally listed marine mammals.

MARINE MAMMAL PROTECTION ACT

Potential impacts to four marine mammal species which are not listed under either the CESA or the FESA, but receive protection under the Marine Mammal Protection Act (MMPA), were considered during the preparation of the Draft EIR/EIS. The BSA is located near the shoreline in the vicinity of the historical range of these species which have been identified to potentially occur, including:

- Harbor seal (*Phoca vitulina*)
- Harbor porpoise (*Phocoena phocoena*)
- California sea lion (*Zalophus californicus*)
- Gray whale (Eschrichtius robustus)

Several species of marine mammals occur off of the central California coast; however, only a few species have been known to enter the Bay, including harbor seal, California sea lion, harbor porpoise and gray whale, all of which have potential to occur in the vicinity of the BSA. Although the BSA is located immediately adjacent to the Bay, no work would be conducted within the limits of the Bay, and the only aquatic habitat present within the BSA is limited to concrete-lined drainage swales adjacent to roadsides, which do not provide habitat for marine mammal species. California sea lions and harbor seals forage aquatically but use land to haul-out and pup. Gray whales and harbor porpoises are entirely aquatic, ocean species, and the likelihood of them occurring in waters adjacent to the site is extremely low. There will be no direct project effects on these species. The project would have no effect on gray whale and/or harbor porpoise with the implementation of BMPs described in Section 3.17.2.4 and the hydroacoustic analysis described below designed to protect adjacent aquatic habitats during construction.

Because of their presence in the Bay and potential to use surrounding shoreline habitats, harbor seals and California sea lions are discussed in more detail below.

Harbor Seal

Harbor seals are permanent residents in the San Francisco and San Pablo bays. They forage aquatically but use land to haul-out and pup. They feed on a variety of fish including surf perch (Embiotocidae fishes) and plainfin midshipman (*Porichthys notatus*), with variation in the dominant fish taken both seasonally and based upon the portion of the bay in which they reside. Harbor seals are generally solitary, or in mother-pup pairs when in the water, although they will haul-out in groups ranging in size from a few individuals to several hundred (Riedman 1990). Harbor seals breed in the spring and early summer, giving birth 11 months later to a single pup. Pups are weaned in weeks.

Harbor seals haul out at 12 main sites in the San Francisco Bay (Marine Mammal Monitoring Plan: San Francisco – Oakland Bay Bridge East Span Seismic Safety Project, 2002), with several smaller sites used as well, and had eight known pupping sites in the early 1990s (Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish and wildlife, 2000). Haul-out sites generally require several features to be suitable for harbor seals, such as sloping terrain, deep water immediately adjacent, and no disturbance from boats or land access. Seals are extremely sensitive to human disturbance, are extremely wary of their surroundings, and have been known to abandon haul-out sites when disturbance increases and/or food resources decrease, as evidenced by the abandonment of Strawberry Spit near Marin (Grigg 2000). Many of the sites traditionally used are islands or completely surrounded by water, such as Brooks Island, and Castro Rocks, and there has been some limited use of a floating abandoned dock by Sausalito. Pupping sites are generally the most protected from disturbance, and harbor seals are slow to colonize new pupping sites. Harbor seals have been known to pup at Castro Rocks, Newark Slough, and Mowry Slough (Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish and wildlife, 2000).

Harbor seals are known to haul-out on the southeast side of YBI 1,600 feet from the BSA (Marine Mammal Monitoring Plan: San Francisco – Oakland Bay Bridge East Span Seismic Safety Project, 2002; Revised Marine Mammal Monitoring Plan: San Francisco – Oakland Bay Bridge East Span Seismic Safety Project, 2004; Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish and wildlife, 2000) (Figure 13.7-8). The haul-out site on YBI is a small rocky beach in a cove just west of the lighthouse, surrounded by steep hillsides, making access by land difficult and thereby minimizing disturbance. In 1999, the haul-out site at YBI had 72 seals and three pups reported (Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish and wildlife, 2000), although this site is not confirmed as an active pupping site, as no births have been observed at the site. While the YBI haul-out site is an active and well-used site, its relative isolation from disturbance distinguishes it from the rest of the island, and in particular the BSA.

The BSA is located away from the shoreline and does not include beach areas easily accessed by seals for haul-out purposes, with the exception of the southeastern edge, which is adjacent to a small area of sandy beach. This beach area is subject to a large amount of water-based human disturbance from the nearby USCG facility as well as ongoing construction disturbance from the land, which would likely preclude harbor seals from hauling out at this location. Furthermore, there are no records of harbor seals using this area for hauling out. Based on the absence of suitable haul-out habitat, harbor seals are not expected to occur on-site. However, harbor seals may forage in the Bay immediately offshore from the project area. No components of the project are immediately adjacent to the water.

Although there is an active haul-out and potential pupping site on YBI, this haul-out site is located more than 487.7 meters (1,600 feet) from the BSA and is characteristically distinct from the BSA. The haul-out site is not within line of sight of the BSA and is protected by the surrounding hillsides. Based on the absence of suitable haul-out habitat, harbor seals are not expected to occur on-site (see the NES in Appendix N).

Project construction activities that involve loud equipment such as pile driving have the potential to injure or disturb behavior patterns of harbor seals utilizing waters of the San Francisco Bay adjacent to the site. The project will employ pile driving techniques under both alternatives. However, none of these activities will occur within aquatic habitats. All construction activities, including pile driving of piers for installation of the ramps, will occur on land in soils that are not saturated. H-piles (steel piles) will be driven into the ground; the other type of piles to be used are concrete piles which are to be placed, not driven (a hole is augered and the concrete is placed inside). The closest H-piles will be driven approximately 91.4 meters (300 feet) from the shoreline under Alternative 2b and 27.4 meters (90 feet) from the shoreline under Alternative 4. The primary source of underwater noise would be ground borne vibration released into the bay. A hydro-acoustic analysis for pile driving activities under both project alternatives was prepared (Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3, 2011a; E-Mail Correspondence: Airborne Noise from Pile Driving. January 6, 2011b). Predictions for distances to accepted NMFS thresholds were made using actual measurements taken by Illingworth & Rodkin, Inc. from similar pile driving experiences. Injury and behavioral disturbance thresholds accepted by NMFS are described by root-mean-square pressure (RMS) for marine mammals as follows:

Marine Mammal Disturbance Thresholds for Marine Construction Activities

	Airborne Noise Threshold (dB re: 20μPa)	Underwater Noise threshold (dB re: 1μPa)		
Species	**In Air Sound Pressure Levels (RMS)**	**Vibratory Pile Driving Disturbance Threshold**	**Impact Pile Driving Disturbance Threshold**	**Injury Threshold**
Harbor Seals	90 dB RMS[1] (un-weighted)	120 dB RMS	160 dB RMS	190 dB RMS
Sea Lions and Sea Otters	100 dB RMS[1] (un-weighted)	120 dB RMS	160 dB RMS	190 dB RMS
Cetaceans	NA	120 dB RMS	160 dB RMS	180 dB RMS

Source: (70 FR 1871), Southal et al. 2007: 71FR 3260 January 20, 2006; and WADOT.wa.gov/nr/rdonlyres/216F21DA../BA_Marine/Noisethreshold.pdf

The data used in this analysis is based primarily on data measured for installation of a temporary crane platform on YBI in November 2008. Therefore soil types and transmission loss through the soils would be similar to the project area, providing a reasonable comparison. For the crane platform, piles were driven approximately 12.2 meters (40 feet) from the water's edge producing maximum underwater sound levels of 157 dB RMS at underwater measurement locations of 39.9 meters (131 feet). This was the closest location that measurements could be made due to the shallowness of the water. The closest pile for Alternative 4 is located 27.4 meters (90 feet) from the shoreline. Given that this pile will be farther away from marine mammal foraging habitat than those installed for the crane platform, underwater noise levels are expected to be even lower for construction of the YBI Ramps under both alternatives. Thus, project construction noise levels are not expected to reach the minimum established injury threshold of 190 dB RMS nor the minimum established disturbance threshold of 160 dB RMS for harbor seals (Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3, 2011a).

Although there is an active haul-out, and potential pupping site on YBI, this haul-out site is located over 487.7 meters (1,600 feet) from the study area and is characteristically distinct from the study area. The haul out site is not within line of sight of the study area and is protected from the study area by the surrounding hillsides. Theanalysis calculated the distance to the airborne noise disturbance limit for harbor seals (90 dB RMS) to be

213.4 meters (700 feet) for Lmax/RMS (maximum sound level) and 76.2 meters (250 feet) for Leq/RMS during pile driving activities (E-Mail Correspondence: Airborne Noise from Pile Driving. January 6, 2011b). Given the distance of the haul out site, the airborne noise threshold of 90 dB RMS will not be reached at that location during pile driving activities. Sound levels of air-borne construction noise may approach these levels at the water's surface adjacent to the site however any foraging harbor seals could avoid disruption by swimming under water where sound levels are not expected to reach disturbance thresholds as described above.

Based on the absence of suitable haul-out habitat on site, distance and topographic position of the known haul out site on YBI, the absence of construction activity within the San Francisco Bay, and the above hydroacoustic analysis, no effects to harbor seals are expected from either project alternative.

California Sea Lion

California sea lions occur along the entire California coast and occur year-round in the Bay. California sea lions breed from San Luis Obispo County south to the Gulf of California, Baja California, Mexico, although they have been known to breed farther north on rare occasions. Pups are born between May and June. California sea lions feed primarily on schooling fish species such as anchovies, midshipman, and Pacific herring (Goals Project 2000). In the San Francisco Bay, populations of California sea lion peak during the winter herring run from December to February. California sea lions are only known to haul-out in three places in the Bay: Pier 39 in San Francisco (Biological Monitoring and Mitigation Compliance Report (July), 2002; Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish and wildlife, 2000), Angel Island, and Seal Rock, which is located just beyond the Golden Gate Bridge.

While California sea lions could potentially forage near the BSA, it is unlikely that any individuals would haul-out near the BSA. Based on the absence of suitable haul-out habitat and the absence of construction activity within the Bay, California sea lions are not expected to occur on-site (see the NES in Appendix N).

Project construction activities that involve loud equipment such as pile driving have the potential to injure or disturb behavior patterns of sea lions utilizing waters of the San Francisco Bay adjacent to the site. The project will employ pile driving techniques under both alternatives. However, none of these activities will occur within aquatic habitats. All construction activities, including pile driving of piers for installation of the ramps, will occur on land in soils that are not saturated. H-piles (steel piles) will be driven into the ground; the other type of piles to be used are concrete piles which are to be placed, not driven (a hole is augered and the concrete is placed inside). The closest H-piles will be driven approximately 91.4 meters (300 feet) from the shoreline under Alternative 2b and 27.4 meters (90 feet) from the shoreline under Alternative 4. The primary source of underwater noise would be ground borne vibration released into the bay. A hydro-acoustic analysis for pile driving activities under both project alternatives was prepared (Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3, 2011a; E-Mail Correspondence: Airborne Noise from Pile Driving. January 6, 2011b). Predictions for distances to accepted NMFS thresholds were made using actual measurements taken by Illingworth & Rodkin, Inc. from similar pile driving experiences. Injury and behavioral disturbance thresholds accepted by NMFS are described by root-mean-square pressure (RMS) for marine mammals as follows:

Marine Mammal Disturbance Thresholds for Marine Construction Activities

	Airborne Noise Threshold (dB re: 20µPa)	Underwater Noise threshold (dB re: 1µPa)		
Species	**In Air Sound Pressure Levels (RMS)**	**Vibratory Pile Driving Disturbance Threshold**	**Impact Pile Driving Disturbance Threshold**	**Injury Threshold**
Harbor Seals	90 dB RMS[1] (un-weighted)	120 dB RMS	160 dB RMS	190 dB RMS
Sea Lions and Sea Otters	100 dB RMS[1] (un-weighted)	120 dB RMS	160 dB RMS	190 dB RMS
Cetaceans	NA	120 dB RMS	160 dB RMS	180 dB RMS

Source: (70 FR 1871), Southal et al. 2007: 71FR 3260 January 20, 2006; and WADOT.wa.gov/nr/rdonlyres/216F21DA../BA_Marine/Noisethreshold.pdf

The data used in this analysis is based primarily on data measured for installation of a temporary crane platform on YBI in November 2008. Therefore soil types and transmission loss through the soils would be similar to the project area, providing a reasonable comparison. For the crane platform, piles were driven approximately 12.2 meters (40 feet) from the water's edge producing maximum underwater sound levels of 157 dB RMS at underwater measurement locations of 39.9 meters (131 feet). This was the closest location that measurements could be made due to the shallowness of the water. The closest pile for Alternative 4 is located 27.4 meters (90 feet) from the shoreline. Given that this pile will be farther away from marine mammal foraging habitat than those installed for the crane platform, underwater noise levels are expected to be even lower for construction of the YBI Ramps under both alternatives. Thus, project construction noise levels are not expected to reach the minimum established injury threshold of 190 dB RMS nor the minimum established disturbance threshold of 160 dB RMS for sea lions (Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3, 2011a).

The analysis calculated the distance to the airborne noise disturbance limit for sea lions (100 dB RMS) to be 70.14 meters (230 feet) for Lmax/RMS (maximum sound level) and 24.4 meters (80 feet) for Leq/RMS during pile driving activities (E-Mail Correspondence: Airborne Noise from Pile Driving. January 6, 2011b). Sound levels of air-borne construction noise may approach the airborne noise threshold of 100 dB RMS at the water's surface immediately adjacent to the site for Alternative 4 where pile driving will occur within 27.4 meters (90 feet) of the shoreline; however, any foraging sea lions could avoid disruption by swimming under water where sound levels are not expected to reach disturbance thresholds.

Based on the absence of suitable haul-out habitat on site, the absence of construction activity within the San Francisco Bay, and the above hydroacoustic analysis, no effects to sea lions are expected from either project alternative.

3.17.5.4 Avoidance, Minimization, and/or Mitigation Measures

FISH

The project design is such that protected fish would be not be affected by construction activities. Construction noise levels, including pile driving, would be below established thresholds to avoid potential injury to protected fish located in aquatic habitats adjacent to the site.

The project would not result in the loss of any habitat for Federally listed fish species and therefore compensatory measures are not proposed.

BIRDS (NONRAPTORS)

Bank Swallow

Any removal of structures, trees, or shrubs, or construction activities in the vicinity of active nests could result in nest abandonment, nest failure, or premature fledging. Destruction or disturbance of active nests would be in violation of the MBTA and Fish and Game Code. Therefore, the following measures would be implemented to avoid project-related impacts to potentially nesting bank swallows in proximity to construction areas, in coordination with CDFG:

1. The removal of any structures, trees, or shrubs would occur from September 1 through February 1, outside the passerine and nonpasserine landbird breeding season. If removal of trees or shrubs occurs, or construction begins between February 1 and August 31 (the nesting season), a nesting bird survey would be performed by a qualified biologist within 15 days prior to the removal of potential nesting structures, trees, or shrubs, or prior to disturbance of areas in the vicinity of potential nest sites, i.e., hillsides and trees.

2. All active nests would be flagged and a nondisturbance buffer zone established around the nesting tree (or other nesting substrate) in coordination with CDFG. Buffer zones for passerines and nonpasserine land birds typically range between 15.2 to 27.4 meters (50 and 90 feet) depending on the species involved, site conditions, and type of work proposed in the vicinity. Contractor education would be conducted for nesting birds, including a discussion of avoidance and protection measures.

3. Active nests would be monitored by a qualified biologist in coordination with CDFG to determine when the young have fledged and are feeding on their own. The project biologist would be consulted for clearance before construction activities resume in the vicinity.

4. If a new nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area.

No compensatory measures are proposed for this species.

MARINE MAMMALS

Harbor Seal

The project design is such that harbor seal habitat and individuals will be avoided by construction activities. Based on the hydroacoustic analysis (Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3, 2011a; E-Mail Correspondence: Airborne Noise from Pile Driving. January 6, 2011b), no avoidance measures are proposed.

The project would not result in loss of any harbor seal habitat and therefore compensatory measures are not proposed.

California Sea Lion

The project design is such that sea lion habitat and individuals will be avoided by construction activities. Based on the hydroacoustic analysis (Memo: Yerba Buena Island – Pile Driving Noise Descriptions. January 3, 2011a; E-Mail Correspondence: Airborne Noise from Pile Driving. January 6, 2011b), no avoidance measures are proposed.

The project would not result in loss of any sea lion habitat and therefore compensatory measures are not proposed.

3.17.6 Invasive Species

3.17.6.1 Regulatory Setting

On February 3, 1999, President Clinton signed EO13112 requiring Federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” FHA guidance issued August 10, 1999 directs the use of the state’s noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

3.17.6.2 Affected Environment

The following technical reports were consulted:

- Invasive Plants of California’s Wildlands. University of California Press. Berkeley, California. 360 pp. (2000)

- Pest Ratings Of Noxious Weed Species And Noxious Weed Seed. January. http://www.cdfa.ca.gov/phpps/ipc/weedinfo/winfo_list-pestrating.htm (2010)

- Non-Native and Nuisance Terrestrial Vertebrates in California. Accessed 6/25/2009. http://www.dfg.ca.gov/wildlife/nongame/nuis_exo/exo_spp.html. (2009d)

- California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council: Berkeley, California. (2006)

- Natural Environment Study: YBI Ramps Improvement Project. (2011b)
- California State Noxious Weeds List. http://plants.usda.gov/java/noxious?rptType=State&statefips=06. Accessed 6/25/2009. (2009)

INVASIVE PLANTS

Within almost all of the major vegetation communities, except for central coast riparian scrub, there exist substantial populations of invasive plant species that encompass a range of very low to severe invasive potential (Table 3.17-3). The eucalyptus woodland contains Tasmanian blue gum eucalyptus (*Eucalyptus globulus*), French broom (*Genista monspessulana*), Scotch broom (*Cytisus scoparius*), English ivy (*Hedera helix*), and Himalayan blackberry (*Rubus discolor*). The mixed broadleaf-conifer forest contains Tasmanian blue gum and blackwood acacia (*Acacia melanoxylon*). The understory is dominated by French and Scotch broom, English ivy, Himalayan blackberry, and periwinkle (*Vinca major*). The non-native scrub area contains common fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), and broom species. The northern foredune community contains iceplant (*Carpobrotus edulis*), sea rocket (*Cakile maritima*), buttercup (*Oxalis pes-carpae*), Bermuda grass (*Cynodon dactylon*), and common fennel.

The landscaped/disturbed vegetation community contains common fennel, rip-gut brome (*Bromus diandrus*), wild oat (*Avena fatua*), barley (*Hordeum marinum* and *Hordeum murinum*), cotoneaster (*Cotoneaster pannosa* and *lacteus*), California burclover (*Medicago polymorpha*), broad-leafed fillaree (*Erodium botrys*), milk thistle (*Silybum marianum*), perennial pepperweed (*Lepidium latifolium*), English plantain (*Plantago lanceoloata*), ox-eye daisy (*Leucantherum vulgare*), brooms, and English ivy. The ruderal vegetation community supports common fennel, black mustard, and wild radish (*Raphanus sativus*). Invasive grasses present in the ruderal vegetation community include Italian ryegrass (*Lolium multiflorum*), rip-gut brome, soft chess (*Bromus hordeaceous*), California bur-clover, and bristly ox-tongue (*Picris echioides*).

NON-NATIVE/NUISANCE WILDLIFE

Throughout the various habitats within the YBI site and due to the plethora of edge effects created by adjacent ongoing disturbance associated with human uses (e.g., roadways, existing structures, and construction) a variety of non-native bird species occur and nest in this habitat such as the house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), and European starling (*Sturnus vulgaris*). Larger wildlife species associated with disturbed lands and associated with close contact to urban areas such as black rat (*Rattus rattus*), Norway rat (*Rattus norvegicus*), and house mouse (*Mus musculus*), as well as feral cats (*Felis cattus*) and opossum (*Didelphus virginianus*) reside here also.

3.17.6.3 Environmental Consequences

YBI's location in the central part of San Francisco Bay, even aside from new construction and development, provides a hospitable habitat for invasive species due to its location at the crossroads of a busy marine port and interstate freeway thoroughfare. As a direct result of project grading, land disturbance, and debris generated from construction for either build alternative, YBI would be subject to the potential increase spread of invasive plant and wildlife species. Invasive plant species can be spread through construction equipment tire treads, construction materials, land clearing, people, and wildlife. Invasive/nuisance wildlife would be attracted to garbage created by construction staff and traffic. Land clearing and vegetation removal provides the ideal habitat for invasive plant and animal species colonization due to their success as

Table 3.17-3: Invasive Potential of Plants within Yerba Buena Island Ramps Project Biological Study Area Vegetation Communities

Vegetation Community	Low Invasive Potential	Moderate Invasive Potential	Severe Invasive Potential
Eucalyptus Woodland		Tasmanian blue gum eucalyptus (*Eucalyptus globulus*) Scotch broom (*Cytisus scoparius*)	French broom (*Genista monspessulana*) English ivy (*Hedera helix*) Himalayan blackberry (*Rubus discolor*)
Mixed Broadleaf-Conifer Forest	blackwood acacia (*Acacia melanoxylon*)	Tasmanian blue gum eucalyptus (*Eucalyptus globulus*) Scotch broom (*Cytisus scoparius*) big periwinkle (*Vinca major*)	French broom (*Genista monspessulana*) English ivy (*Hedera helix*) Himalayan blackberry (*Rubus discolor*)
Non-Native Scrub		common fennel (*Foeniculum vulgare*) black mustard (*Brassica nigra*) Scotch broom (*Cytisus scoparius*)	French broom (*Genista monspessulana*)
Northern Foredune		sea rocket (*Cakile maritima*) common fennel (*Foeniculum vulgare*) buttercup (*Oxalis pes-caprae*) Bermuda grass (*Cynodon dactylon*)	iceplant (*Carpobrotus edulis*)
Landscaped/Disturbed	California burclover (*Medicago polymorpha*) broadleaf filaree (*Erodium botrys*) blessed milkthistle (*Silybum marianum*) English plantain (*Plantago lanceolata*)	common fennel (*Foeniculum vulgare*) rip-gut brome (*Bromus diandrus*) wild oat (*Avena fatua*) Mediterranean barley (*Hordeum marinum*) foxtail barley (*Hordeum murinum*) Parney's cotoneaster (*Cotoneaster lacteus*) ox-eye daisy (*Leucantherum vulgare*)	silverleaf cotoneaster (*Cotoneaster pannosus*) perennial pepperweed (*Lepidium latifolium*) English ivy (*Hedera helix*)
Ruderal	wild radish (*Raphanus sativus*) soft brome (*Bromus hordeaceus*) California burclover	common fennel (*Foeniculum vulgare*) black mustard (*Brassica nigra*) rip-gut brome	

Vegetation Community	Low Invasive Potential	Moderate Invasive Potential	Severe Invasive Potential
Ruderal	(*Medicago polymorpha*)	(*Bromus diandrus*) Italian ryegrass (*Lolium multiflorum*) bristly oxtongue (*Picris echioides*)	

Source: Natural Environment Study: YBI Ramps Improvement Project 2011b

generalists in landscapes that lack specified ecological niches. Through this process, invasive species can increase the ecological homogenization of YBI. Measures to avoid, minimize, and compensate these environmental consequences are outlined below in Section 3.17.6.4.

3.17.6.4 Avoidance, Minimization, and/or Mitigation Measures

To avoid the environmental consequences outlined above, there would be a multilayered approach to avoid, minimize, and/or compensate the project's effects. In compliance with EO 13112, and subsequent guidance from FHWA, the landscaping and erosion control measures included in the project would not use species listed as noxious or invasive weeds by the California Department of Food and Agriculture (CDFA 2010). In areas of particular sensitivity, extra precautions would be taken if invasive species are found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

For botanical resources, hydroseeding and replanting for erosion control and revegetation of slopes would be verified for being invasive plant/weed-free before application by an established, approved, licensed, and insured contractor. Local native plant ecotypes would be used for replanting in affected areas. Standard BMPs would be implemented. To minimize attracting non-native/nuisance wildlife, garbage generated on-site would be appropriately disposed of in garbage cans placed throughout the site and deposited into large and secure dumpsters daily. These dumpsters would be emptied on a weekly basis before dusk. On-site toilets would be maintained daily for site sanitation and to avoid attracting more nuisance wildlife. Worker education would focus on the diminishment and disposal of on-site garbage and the factors associated with decreasing invasive species potential on-site.

By encouraging proper and timely sanitation of construction-generated waste (especially food), invasive rodent (e.g., mice and rat) activity would be controlled. In most urbanized environments random food scraps and overgrown or salvage areas provide abundant forage and habitat for rodents. Neat, off-the-ground storage of pipes, girders, cable, wire, and lumber would help reduce the suitability of the area for rats and would also make rodent detection easier. Garbage and trash, and all garbage receptacles, would have tight-fitting covers. Feral pets should not be encouraged through provision of food for feeding. This food may become a ready supply of food for rats and mice, or other nuisance wildlife.

Overall, the introduction and spread of exotic and invasive plant and wildlife species would be avoided to the maximum extent possible. BMPs, as identified by the SFRWQCB and described in Section 3.17.2.4, would be implemented to control erosion while not increasing the spread of invasive plant or wildlife species. In some cases, hydroseeding or rapid replanting measures can increase the spread of weed/invasive grass species through lack of seed purity or insufficient preparation of the seed mix. Revegetation contractors would implement standard quality assurance/quality control measures to verify the purity of native seed mix and the site appropriateness of ecotypes for revegetation utilizing container plants.

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3.18 Relationship between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Project implementation would result in attainment of short-term and long-term transportation and economic objectives at the expense of some long-term aesthetic, biological, noise, and other land use impacts.

3.18.1 Alternatives 2b and 4

The build alternatives would have the following similar impacts:

Short-term losses include construction impacts such as noise and motorized and nonmotorized traffic delays or detours.

Short-term benefits include increased jobs and revenue generated during construction.

Long-term losses include permanent loss of plant and wildlife resources, visual impacts, and use of construction materials and energy.

Long-term gains include Traffic safety, geometric configuration, traffic operations LOS improvements of the transportation network of the region and the project vicinity, increased access, reduction of congestion on local streets and highways, and support of approved development.

3.18.2 No Project

This alternative would offer none of the potential gains nor have any of the potential losses listed above.

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3.19 Irreversible and Irretrievable Commitments of Resources That Would Be Involved in the Proposed Project

Implementation of the YBI Ramps Improvement Project involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion would ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material would be expended. Additionally, large amounts of labor and natural resources would be used in the making of construction materials. These materials would generally not be retrievable. However, these materials are not in short supply and their use would not have an adverse effect upon continued availability of these resources. Any construction would also require a substantial one-time expenditure of both state and Federal funds, which are not retrievable; savings in energy, time, and a reduction in accidents would offset this. In addition to the costs of construction and right-of-way would be costs for roadway maintenance, including pavement, roadside, litter/sweeping, signs and markers, electrical and storm maintenance.

The commitment of these resources is based on the concept that residents in the immediate area, region, and state would benefit from the improved quality of the transportation system. These benefits would consist of improved accessibility and safety, which are expected to outweigh the commitment of these resources.

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3.20 Cumulative Impacts

3.20.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the proposed project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 C.F.R., Section 1508.7 of the CEQ Guidelines.

3.20.2 Cumulative Actions and Processes Considered

Cumulative impacts due to past, present, and future activities or actions of Federal, non-Federal, public, and private entities as well as relevant ongoing and anticipated processes were identified for purposes of evaluating cumulative environmental impacts. Reasonable foreseeable projects are those that are likely to occur in the future and would add to the cumulative impact on a particular resource. Other reasonably foreseeable current and future actions in the project area include:

- the SFOBB ESSSP (construction currently underway; construction scheduled through 2013);

- the TI/YBI Redevelopment Project (currently undergoing environmental review; construction anticipated between 2011 and 2022);

- the San Francisco Bicycle Plan (adopted June 2009; construction of Treasure Island perimeter bikeway path to occur in conjunction with TI/YBI Redevelopment Project); and,

- the San Francisco-Oakland Bay Bridge: capital projects (California Senate Bill 1061), which would allow a portion of Bay Bridge toll funds to be spent on this project, was passed by the State Assembly Committee on Transportation on June 22, 2010; this project has not yet undergone environmental review. Construction completion is anticipated in 2014).

These current and future actions are described in *Section 1.3 Related Plans and Projects* of this Draft EIR/EIS, and their respective locations are depicted in Figure 1-4.

In addition to these current and future actions, the ongoing and anticipated process of sea level rise within the San Francisco Bay is included for evaluation purposes. California Climate Action Team–funded research for a 2009 report (the 2009 California Climate Adaptation Strategy) to Governor Schwarzenegger estimates that sea level rise will increase in California between 30.5 and 43.2 centimeters (12 and 17 inches) by 2050 and between 50.8 and 139.7 centimeters (20 and 55 inches) by 2099 (SFBCDC 2009). In addition, the California Department of Water Resources supports a range in sea level rise of 17.8 to 139.7 centimeters (7 to 55 inches) along California's Coast by 2100 (CDDWR 2008). In addition, the most recent climate science report, the 2009 Copenhagen Diagnosis, estimates that global sea level rise will increase up to approximately 199.9 centimeters (78.7 inches) by 2100 (Allison 2009). Based on these predictions, sea level rise would likely cause inundation of some portions of YBI and TI.

3.20.3 Methodology/Approach

In accordance with NEPA and CEQA, if a project would not cause direct or indirect impacts on a resource, it would not contribute to a cumulative impact on that resource and need not be further evaluated. The initial step in the cumulative impact analysis is the identification of those resources to be considered, which consists of resources that would be adversely and significantly (despite mitigation) impacted by the proposed project and resources currently in poor or declining health or at risk even if project impacts are relatively small (less than significant). Resources that have been identified in this EIR/EIS to be adversely and significantly (despite mitigation) impacted by the proposed project are visual resources, cultural resources, plant species, animal species, and threatened and endangered species). Despite some existing air quality, water quality, and traffic issues within the Bay Area, these resources are not considered in poor or declining health nor are they considered at risk from less-than-significant air quality, water quality, and traffic impacts of the proposed project. Rather, with continued implementation of new regulations and new improvement projects with associated mitigation, these resources have and will continue to improve within the Bay Area. As such, these resources are not included in this cumulative impact analysis.

The second step in the cumulative impact analysis is to identify the resource study area (RSA) for each resource. The RSA for each previously identified issue area is described at the beginning of the respective cumulative impact analyses in Section 3.20.4.

The third step in the cumulative impact analysis is to describe the current health and historical context for each resource. The context for each previously identified resource is discussed within the respective cumulative impact analyses in Section 3.20.4.

The fourth step in the cumulative impact analysis is to identify direct and indirect impacts of the proposed project that might contribute to a cumulative impact. The impact conclusion summary for each previously identified resource is discussed within the respective cumulative impact analyses in Section 3.20.4.

The fifth step in the cumulative impact analysis is to identify other current and reasonably forseeable future actions or projects that affect each resource. This discussion narrows down which of the previously identified actions and processes would affect the particular resource and is discussed within the respective cumulative impact analyses in Section 3.20.4.

The sixth step is the actual assessment of potential cumulative impacts. The cumulative impact analysis for each previously identified resource is discussed within the respective cumulative impact analyses in Section 3.20.4.

The seventh step is to summarize the step-wise cumulative impact analysis process. Thus, a cumulative impacts results summary table is provided in Section 3.20.5.

Finally, the eighth step in the cumulative impact analysis is to assess the need for cumulative impact mitigation. This discussion is contained in Section 3.20.6.

3.20.4 Impact Analysis

3.20.4.1 Visual Resources

RESOURCE STUDY AREA

For potential cumulative visual impacts, the RSA is represented by the area encompassing eight key viewpoints described in Section 3.7. The key viewpoints were chosen to help evaluate the project's visual impact as experienced by viewers at various locations on the island as well as areas in the vicinity of YBI. These viewpoints are representative of the visual environment experienced by the widest cross section of viewers.

CURRENT HEALTH AND HISTORICAL CONTEXT

Current and recent trends affecting visual resources in the project area include the ongoing construction of the SFOBB ESSSP. The construction of the new east span of the SFOBB and the related tie-ins at YBI may result in temporary, degraded aesthetics in the project area. However, the final, streamlined aesthetic of the SFOBB ESSSP would be an improvement over the aging, bulkier infrastructure that is currently in place. Furthermore, the project area has a history of being the transition viewpoint between the two different-looking parts of the SFOBB. Thus, given the existence of the SFOBB and its tie-ins at YBI since the 1930s, the SFOBB and its tie-ins are a familiar visual resource in the Bay Area.

SUMMARY OF IMPACTS OF THE PROPOSED PROJECT

Table 3.7-1 (Summary of Project's Visual Quality Impacts) provides a concise description of the visual impacts associated with Alternative 2b and Alternative 4 for each of the eight identified viewpoints. The table shows that Alternative 2b would have a less adverse visual impact on the project area than Alternative 4.

Other Actions Affecting the Resource

The area surrounding the proposed project will likely undergo change during the coming years due to construction of the SFOBB ESSSP, which will be a visually prominent project in the area. Figures 3.7-3 through 3.7-18 include simulations that represent likely changes to the visual environment and viewpoints from both the proposed project and the SFOBB ESSSP. In addition, the area would change visually due to a number for planned projects such as the TI/YBI Redevelopment Project, the SF Bicycle Plan, and the West Span Bay Bridge Bicycle and Pedestrian Pathway, if implemented. The TI/YBI Redevelopment Project would contribute to the largest amount of visual change on TI and YBI. The redevelopment project would intensify the development on the islands with the construction of housing, commercial and retail space, office space, hotel rooms, all of which would which would alter the visual composition of the islands.

CUMULATIVE IMPACTS ASSESSMENT

An evaluation of cumulative visual impacts was completed in part through review of the YBI Ramps Improvement Project VIA (Appendix I), as well as through consultation with Caltrans personnel.

Development associated with the SFOBB would contribute to the changing character of the landscape. The SFOBB project would generally have the effect of reducing the impact of the proposed YBI ramps, with the former being considerably more visually prominent from various viewpoints than the latter. However, in some instances, the proposed project's contribution to area-wide changes to the visual setting would be equal to changes attributable to the SFOBB project. Ramp features associated with Alternative 2b would have a lesser cumulative impact on the area's visual setting than the ramp features associated with Alternative 4. The ramp structures associated with Alternative 2b would be less massive than those associated with Alternative 4. Implementation of Alternative 2b would result in a smaller ramp footprint, especially in the case of the westbound on-ramp, when compared to Alternative 4. SFCTA has been developing avoidance, minimization, and mitigation measures that would reduce the impacts to viewpoints associated with the proposed project and the visual quality of the viewshed. These measures identified in section 3.7.5 would help reduce the effect on the visual environment in the area of the proposed new ramps through replacement vegetation as well as planting new vegetation and matching the new ramps to the ribbed structural form and architectural vocabulary of the new SFOBB. Additionally, it would be expected that the TI/YBI Redevelopment Project would be required to develop mitigation to lessen impacts to visual resources resulting from this proposed redevelopment project. Therefore, no cumulative impacts are anticipated related to visual resources within the project area.

3.20.4.2 Cultural Resources

IDENTIFICATION OF PROJECT-SPECIFIC CULTURAL RESOURCES CONSIDERED IN CUMULATIVE IMPACT ANALYSIS

Cumulative impacts analysis should focus on those resources that would be significantly impacted by the project or resources currently in poor or declining health, even if project impacts are relatively small[22]. As described in section 3.8.3.2 of this document, both Alternative 2B and 4 would cause adverse impacts (direct or indirect, depending upon the alternative) to the following cultural resources:

- Senior Officers' Quarters Historic District (with Quarters 1/ Nimitz House as an individually eligible resource)

[22] Caltrans Guidance for Preparers of Cumulative Impacts Analysis: Approach and Guidance. June 30, 2005. A component of the Caltrans SER "Other Guidance". Accessed on-line at http://www.dot.ca.gov/ser/cumulative_guidance/approach.htm.

- Quarters 1/Nimitz House
- Quarters 10 (with Building 267 as a contributing feature)

Although the San Francisco-Oakland Bay Bridge (SFOBB) is a recognized historical resource, the portion located within the project area will be replaced as part of a preceding project prior to the initiation of the YBI Ramps project. For that reason, the historic structure was not included as part of the existing conditions used to assess the impacts of the YBI Ramps project. Neither of the proposed project alternatives would result in direct or indirect impacts to the Quarters 8 historical resource, and thus it is not considered in the cumulative impacts analysis. Similarly, although an archeological site was identified in the project area, neither of the project alternatives would disturb or impact the site during construction or operation of the new ramps; therefore it is not included in the cumulative impacts analysis.

DEFINITION OF THE RESOURCE STUDY AREA

The Resource Study Area provides a context in which to evaluate the health and condition of the specific resource or resource type being addressed in the cumulative impacts analysis[23]. The RSAs need to contain resources similar to the type of project-specific resources that have been identified as significant for comparison purposes. The RSAs also need to be large enough to allow for the identification of identification of past, present and reasonably foreseeable projects that have, or could impact the resources in the project area.

For the proposed project, geographically broad RSAs have been defined that will allow for an assessment of the Condition of the project-specific resources within the context of other resources that represent the same historical themes. The project-specific resources being considered are the Senior Officers' Quarters Historic District, (which includes Quarters 1/ Nimitz House), and Quarters 10/Building 267.

The Senior Officers' Quarters Historic District is significant for its role in U.S. Naval history in the San Francisco Bay Area. Quarters 1/Nimitz House is significant for its connection to Admiral Chester Nimitz, as well as being a contributor to the Senior Officers' Quarters Historic District. The district is also a fine example of the Classical Revival style unique to the early development of West Coast military facilities. Quarters 10/Building 267 is significant for its ability to express an architectural trend particular to the San Francisco Bay Area during the mid-20th Century that combined three different styles: Moderne, International, and Bay Region. As such, the proposed project will have impacts on resources that are important in terms of naval history and mid-20th century modern design trends.

Because there are two separate types of cultural resources that would be impacted by the proposed project, and thus discussed in the cumulative impacts analysis, two resource-specific RSAs have been utilized.

Historic Naval Facilities on San Francisco Bay RSA

An individual historical resource can represent a significant theme in our history that may be represented by other examples with varying degrees of significance and integrity.

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[23] Ibid, p. 5.

For some historical resources, that theme is represented by just a handful of examples, and thus the impacts of the project on an example within the project area may be considered cumulatively significant when considered along with the effects of other projects on the other related resources. For this reason, the RSA for considering cumulative impacts on the Senior Officers' Quarters Historic District and Quarters 1/Nimitz House includes an area that encompasses historic naval facilities located on or around the San Francisco Bay.

Mid-20th Century Military Residential Architecture of the San Francisco Bay RSA

An individual historical resource can also represent a local example of craftsmanship or unique architectural design that is represented by other examples at the local, state, or national level. While the cultural context of modern architecture is almost limitless, Quarters 10/Building 267 was built by the Navy for a specific purpose in a style unique to the Bay Area. Thus, the RSA for considering cumulative effects on Quarters 10/Building 267 corresponds to other military facilities around the San Francisco Bay that incorporated mid-20th century architectural trends, such as Modern or International Style, in the development of their residential architecture.

CURRENT HEALTH AND HISTORICAL CONTEXT

Historic Naval Facilities on San Francisco Bay RSA

The United States Department of the Navy has had an active presence on the San Francisco Bay since the 19th century.[24] During times of war and in peace, naval shipyards, training centers, air stations and other facilities have played an important role in the regional economy by providing jobs and attracting supporting industries. They have also contributed to the social character of the region, branding the Bay Area as a leader in our national defense and an innovator in the development of new technologies. During the 19th century, the Navy established a presence in the Bay Area to provide coastal defense, with an added emphasis on protecting the massive amounts of trade brought on by the Gold Rush. At the turn of the 20th century the Navy's role expanded to include support of the Pacific Squadron with shipyards and new types of coastal defense. Expansion during the first several decades of the new century responded to technological innovations: hangars and airfields for incorporation of airplanes, submarine stations, radio communications, and expansions for World War I, and training schools to prepare personnel to use these innovations. Between the wars, the Navy began to transfer major functions to the San Diego area; operations in the Bay Area focused on naval air stations, supply networks, ship repair, troop support, and administrative functions. World War II brought a massive build-up, as ships and troops were deployed overseas, requiring facilities for the care and maintenance of both vessels and personnel. From the late 1940s through the 1980s the focus was on weapons, warning systems, and research affiliated with the Cold War. During this time and especially as the Cold War came to a close, the Navy reduced its presence around the Bay.

The closures and realignments associated with the modern BRAC programs have been subject to environmental regulatory review, and in most cases, preservation alternatives or extensive mitigation were implemented where impacts were identified for the National

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[24] The summary of naval activity in the San Francisco Bay area is adapted from Volume III of the *California Historic Military Buildings and Structures Inventory* prepared by JRP Historical Consulting Services and Foster Wheeler Environmental Corporation for the U.S. Army Corps of Engineers, March 2000.

Register of Historic Places (NRHP) historic resources. Overall the condition of resources within this RSA has stabilized, after a period of decline. Table 3.20-1 below provides a summary of historical naval installations on the San Francisco Bay, and the current condition of the known historical resources associated with those facilities.

Table 3.20-1: Summary of Historic Naval Installations on the San Francisco Bay

Historic Naval Facility[25]	Historical Resource(s)	Current Condition[26]
Mare Island Naval Shipyard (Vallejo)	The oldest Navy facility on the West Coast, dating to the 1850s with buildings from every ensuing decade through the 1980s. One National Historic Landmark (NHL) district and one NRHP district have been designated.	The installation was closed in 1996 during the BRAC process and transferred to local authority. Redevelopment plans include conversion to industrial, commercial, and residential uses as well as community uses such as a public golf course and regional park. Impacts were mitigated in 1999 through completion of one of the largest HABS recordation projects ever completed.
Naval Air Station, Alameda	Built in 1938 through the 1940s as an air training facility. One NRHP-eligible historic district was identified.	The installation was closed in 1997 during the BRAC process and transferred to local agency control through leases. A 1999 MOA outlined preservation guidelines and protections of the historic district for layaway and eventual transfer. NAS is slated for transfer to the Alameda Reuse and Redevelopment Authority which is investigating possible development plans for the station.
Naval Air Station, Moffett Field (Sunnyvale)	Established in 1933 as a Lighter-than-Air station. Several historic properties have been identified. The Unitary Plan Wind tunnel Complex is listed as a National Historic Landmark, and the core facility from the 1930s is listed in the NRHP as the Shenandoah Plaza National Historic District. Five individual buildings have been identified as eligible for the NRHP, including the Administration Building, the 40 x 80 Wind Tunnel, the 6 x 6 Supersonic Wind Tunnel, the Arc Jet Laboratory, and the Flight and Guidance Simulation Laboratory.	Transferred to NASA during BRAC realignment in 1994. All facility planning and development is subject to the provisions of an Historic Resources Protection Plan (2002) and coordinated through the base preservation officer. These mechanisms ensure that historic preservation requirements are integrated with NASA decisions regarding mission support.
Naval Fleet and	Established 1940-1945 and served	Transferred from Federal control and

[25] The list of Naval facilities located on the San Francisco Bay was culled from the list of Navy installations and their historical resources survey status in Table 4-2 of Volume I of the *California Historic Military Buildings and Structures Inventory* prepared by JRP Historical Consulting Services and Foster Wheeler Environmental Corporation for the U.S. Army Corps of Engineers, March 2000. The table does not include Navy facilities where historic resource surveys were conducted and concluded that no NRHP-eligible properties are present.

[26] Unless otherwise noted, the current Condition of each facility was derived from the JRP 2000 study (Volume I) with updated information from the Navy's BRAC Program Management Office website (accessed 30 December 2010): http://www.bracpmo.navy.mil/states.aspx?state=california

Industrial Supply Center, Oakland	as the Navy's major supply depot on the West Coast during World War II. One NRHP-eligible district has been identified. Center comprised primarily of warehouses, sheds and support facilities.	redeveloped during expansion of the Port of Oakland's intermodal facility. The Navy and the Port of Oakland executed an MOA in 1999 to address the impacts associated with the demolition of the contributing features of the historic district.
Naval Medical Center, Oakland	Established as a Naval Hospital in 1942 on the grounds of the former Oak Knoll country Club. Although a National Register nomination was prepared for the clubhouse, Navy consultation with the SHPO resulted in a determination that there are no NRHP-eligible historic properties present.	The facility was closed in 1996 was sold at public online auction in 2006.
Naval Station, Treasure Island and Yerba Buena Island	There has been a military presence on Yerba Buena Island since 1848. There are two NRHP listed buildings (Quarters 1/Nimitz House and Quarters 10/Bldg.267), one NRHP-listed district (Senior Officers' Quarters Historic District) and one NRHP-eligible building (19th century anti-ship mine assembly building) present. The USACE built Treasure Island in the late 1930s for the Golden Gate International Exposition and it became a major naval station during World War II. Three individual buildings have been determined NRHP-eligible for their associations with the GGIE and associated architectural trends (Building 1/Administration Building, Building 2/Hall of Transportation, and Building 3/Palace of Fine and Decorative Arts). There are no NRHP historic properties on Treasure Island related to Navy operations.	The majority of the 1900-1923 facility on YBI was demolished by the Navy when the training function was moved to San Diego. Construction of the SFOBB occurred during a time of limited operations on YBI, and there were very few buildings in the alignment of the bridge. As a result, the SFOBB did not result in much demolition of the 1920s era facility.[27] The post-World War II re-orientation of YBI from Receiving Ship facility to residential support for the training center on Treasure Island resulted in the "destruction of most traces of the once-busy Naval Training Station."[28] By 1997 there were only 23 buildings and structures on YBI that dated to the 1900-1923 period. Quarters 10 was the only residence built on YBI post-war, though some older buildings were converted into housing. Naval Station Treasure Island (which included support facilities on YBI) closed in 1997 during the BRAC process. Impacts on historic properties were addressed in a 2003 MOA between the Navy and the City and County of San Francisco. CCSF is a CLG and has preservation ordinance and process to ensure historic properties are given due consideration in planning and development process.
Naval Station and Shipyard Hunters Point	In the early 1940s the Navy acquired an established private shipyard, but didn't use the facility much during World War II. There is	Ceased operations in 1974 then closed in 1988 during the BRAC process. Transfer to the San Francisco Redevelopment Agency began in 2004

[27] National Register of Historic Places Registration Form – Quarters 10 and Building 267, Yerba Buena Island. December 12, 2003. Section 8, Page 3.

[28] DPR 523B Form Senior Officers' Quarters Historic District. Prepared by Stephen D. Mikesell, January 1997. Page 4 of 8.

	one NRHP-eligible historic district (based on the pre-Navy facility) and one NRHP-eligible structure (Dry Dock 4) present.	with the first 75 acre parcel. The status of the transfer of the historic facilities is not known at this time.

Mid-20th Century Military Residential Architecture of the San Francisco Bay RSA

According to the National Register nomination for Quarters 10/Building 267, military architecture in the Bay Area during the late 19th and early 20th centuries relied on standardized plans that reflected the preference for the Classical Revival style, with the occasional introduction of the regional preference for Mission Revival style. The construction campaigns for the World War II build-up reflected the emphasis on practicality and flexibility in design, and incorporation of modern building materials and technologies. Following World War II, this attitude shift created a unique opportunity for military designers to adopt tenets of the Modern design movement, which also emphasized flexibility and technological modernization. Drawing on a combination of Modern, International, and Bay Tradition architectural styles, Quarters 10/Building 267 buildings represents a locally significant example of military housing "that highlights the transition in mid-twentieth century military residential design from Classical Revival to the Modern style of architecture."[29] The Quarters 10/Building 267 nomination suggest that one reason that this example is significant is that it is one of the few instances where the military architects deviated from standard military design and embraced the local traditions so literally.

A review of the comprehensive inventory of military facilities in California compiled in 2000 supports this perspective, and narrows the RSA for this theme down to two installations, Naval Station Yerba Buena Island and NAS Alameda. The summary of the statewide context provided in the table above shows that no other mid-century modern NRHP resources have been identified at Navy facilities in the Bay Area. A similar review of the context's inventory of Army, Air Force, and Marine Corps facilities arrives at the same conclusion. Most military installations in the greater Bay Area (reaching as far as the North Bay, Central Coast. and the Central Valley) were either built in the Classical Revival or Mission Revival styles popular before World War II, were built according to the standardized plans expressly for the World War II readiness, or were augmented with specialized facilities for Cold War military operations. The facilities at Naval Air Station Alameda appear to be the only other example of NRHP-eligible resources that reflect the military use of the Modern trends in architectural design.

Quarters 10 (with its Building 267 garage) was the only Navy residence built on YBI post-World War II, though some older buildings were converted into housing. The residence has functioned as officers housing since its original construction up until the closure of the Navy facility in 1997. Other than deterioration associated with standing vacant, the buildings have been subject to very little physical alteration.

NAS Alameda was built in 1938 through the 1940s as an air training facility. One NRHP-eligible historic district has been identified, including officers housing from 1941 that exhibits a simplified Modern or Art Deco style. The installation was closed in 1997

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[29] National Register of Historic Places Registration Form – Quarters 10 and Building 267, Yerba Buena Island. December 12, 2003. Section 8, Page 7.

during the BRAC process and transferred to local agency control through leases. A 1999 MOA outlined preservation guidelines and protections of the historic district for layaway and eventual transfer. NAS is slated for transfer to the Alameda Reuse and Redevelopment Authority which is investigating possible development plans for the station.

SUMMARY OF IMPACTS OF THE PROPOSED PROJECT

Senior Officers' Quarters Historic District (and Quarters 1/Nimitz House)

Alternative 2b would cause direct impacts on contributing landscape features of both the District and Quarters 1/Nimitz House. Alternative 2b would also have indirect impacts on the District – including Quarters 1/Nimitz House – through introduction of visual elements that diminish the integrity of feeling and setting. Proposed measures to resolve adverse effects as described in the YBI Ramps Project MOA developed under Section 106 of the National Historic Preservation Act (NHPA) include vegetative screening to reduce the visual impact of the new construction, interpretive signs that would help the public understand the significance of the resources, protection and stabilization of historic buildings, and repair of inadvertent damage that may be caused by construction activities. The impact of Alternative 2b on the Senior Officers' Quarters Historic District would be considered adverse.

Alternative 4 would cause indirect impacts to the Senior Officers' Quarters Historic District (including Quarters 1) through the introduction of visual elements that diminish the integrity of the property's integrity of feeling and setting. Proposed measures to resolve adverse effects as described in the YBI Ramps Project MOA developed under Section 106 of the NHPA include vegetative screening to reduce the visual impact of the new construction, interpretive signs that would help the public understand the significance of the resources, protection and stabilization of historic buildings, and repair of inadvertent damage that may be caused by construction activities. The impact of Alternative 4 on the Senior Officers' Quarters Historic District would be considered adverse.

Quarters 10/Building 267

Alternative 2b would require the removal of the NRHP-listed Quarters 10 (which includes Building 267 as a contributing feature). These buildings would be relocated to another location on YBI, in accordance with the stipulations of the MOA. The impact of both the direct and indirect impacts of Alternative 2b on the Quarters 10/Building 267 resource would be considered adverse.

Alternative 4 would cause indirect adverse impacts to Quarters 10/Building 267 through alteration of the resource's setting and potential damage caused by construction vibration. Proposed measures to resolve adverse effects as described in the YBI Ramps Project MOA developed under Section 106 of the NHPA include vegetative screening to reduce the visual impact of the new construction, interpretive signs that would help the public understand the significance of the resources, protection and stabilization of historic buildings, and repair of inadvertent damage that may be caused by construction activities. The impact of Alternative 4 on Quarters 10/Building 267 would be considered adverse, but not as severe as Alternative 2b.

SUMMARY OF ENVIRONMENTAL IMPACTS OF OTHER PAST, CURRENT AND REASONABLY FORESEEABLE ACTIONS

Senior Officers' Quarters Historic District (and Quarters 1/Nimitz House)

Impacts on historic resources in the project area that are related to the Historic Naval Facilities on San Francisco Bay RSA have occurred in the past, and may continue to occur despite regulatory processes that apply to projects subject to state or Federal environmental reviews. The Naval heritage of the Bay Area has been in decline since the 1990s in general, and past impacts to the YBI Naval Training Station in particular have been severe. As described in the Current Health and Historical Context section, construction of the SFOBB did not physically destroy a notable amount of the built environment related to the 1900-1923 facility. However, it made a drastic change in the surroundings of the senior officers' quarters, affecting the feeling and setting of what was later to become the historic district. The post-World War II re-orientation of YBI from Receiving Ship facility to residential support for the training center on Treasure Island resulted in the "destruction of most traces of the once-busy Naval Training Station."[30] By 1997 there were only 23 buildings and structures on YBI that dated to the 1900-1923 period.

Impacts to these resources have also been identified with projects currently occurring. The SFOBB East Span Seismic Safety Project currently under construction will have an adverse effect on the Senior Officers' Quarters Historic District, but will not impact Quarters 10/Building 267. As part of that project, the completion of the West Span Bay Bridge Bicycle and Pedestrian Pathway is likely to increase recreational use of YBI and TI. Both projects would contribute to the cumulative impacts on the Senior Officers' Quarters Historic District and Quarters 1/Nimitz House.

The impacts of the YBI/TI transfer from Navy to CCSF were identified during environmental review, and impacts are being off-set by specific measures codified in the 2003 MOA between the Navy and CCSF. The TI/YBI Redevelopment Project is currently in the environmental review process, so project impacts have not yet been identified. However, the plan generally provides for restoration and reuse of historic resources, including the Senior Officers' Quarters Historic District (including Quarters 1/Nimitz House) as a potential commercial and cultural mixed-use area. Any impacts will be off-set by specific measures codified in an agreement document, if necessary

Quarters 10/Building 267

Until recently, historic residences from the 1940s through 1960s were not recognized as having the potential to qualify as historic resources, and thus environmental reviews rarely accounted for impacts to resources related to the Mid-20th Century Military Residential Architecture on the San Francisco Bay RSA unless the building was known to be of exceptional architectural or historical significance. Mid-century housing at NAS Alameda has been identified for preservation and reuse.

Past projects on YBI have not impacted the known mid-century residences, namely Quarters 10/Building 267 (no other resources of this type occur in the project area).

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[30] DPR 523B Form Senior Officers' Quarters Historic District. Prepared by Stephen D. Mikesell, January 1997. Page 4 of 8.

Other than deterioration associated with standing vacant, the house and garage have been subject to very little physical alteration.

The SFOBB East Span Seismic Safety Project currently under construction will not directly impact Quarters 10/Building 267; the EIS notes that inadvertent damage may occur as a result of construction activities. The completion of the West Span Bay Bridge Bicycle and Pedestrian Pathway may increase recreational use of YBI and TI. However, these projects are not anticipated to contribute to cumulative impacts on Quarters 10/Building 267, since construction-related effects, if any, would be resolved in accordance with the protective and repair measures identified for the SFOBB East Span Seismic Safety project.

The current and proposed redevelopment projects on YBI may impact Quarters 10/Building 267, since they may result in reuse of the buildings under both Alternatives 2b and 4. Such impacts are being off-set through inclusion of preservation standards for potential reuse of the building. Though minor, these impacts may contribute to cumulative impacts on Quarters 10/Building 267.

CUMULATIVE IMPACTS ASSESSMENT

When considered with past, present, and reasonably foreseeable projects, the moderately severe net impacts of the proposed project would contribute to a cumulative impact to the Senior Officers' Quarters Historic District and the Quarters1/Nimitz House, although the impact is not a considerable impact.

When considered with past, present, and reasonably foreseeable projects, the moderately severe net impacts of Alternative 2b would contribute to a cumulative impact on Quarters 10/Building 267, although the impact is not considerable. Likewise, the indirect impacts of Alternative 4 would contribute to a cumulative impact on Quarters 10/Building 267. In both cases, the impact is not a considerable impact.

3.20.4.3 Plant Species

RESOURCE STUDY AREA

For potential cumulative plant species impacts, the RSA encompasses all of YBI and TI, which are separated from other lands in the vicinity by the San Francisco Bay. As a result, YBI and TI are characterized by distinct plant relationships.

CURRENT HEALTH AND HISTORICAL CONTEXT

Based on habitat availability, 34 special-status plant species have been identified to have a low to moderate potential to occur on site. During focused botanical surveys, two of these species were observed in the study area, stinging phacelia and large-flowered sand-spurrey. The large-flowered sand-spurrey population is composed of approximately 20 individuals covering approximately 7.30 square meters (78.53 square feet) of the project area. Furthermore, the northern foredune plant community is a pioneer habitat that has and continues to represent potential habitat for several of the special-status plant species. However, due to the constant wave action and shifting sands, this habitat typically has low species diversity.

Summary of Impacts of the Proposed Project

Special-status, large-flowered sand-spurrey plants are located outside of the proposed temporary and permanent impact areas for both Alternative 2b and Alternative 4. They are, however, located within 30.5 meters (100 feet) of the temporary disturbance areas, and, thus, there is potential for incidental or indirect impacts during construction. However, with implementation of avoidance and minimization measures defined in Section 3.17.3.4, impacts to large flowered sand-spurrey are not anticipated.

Special-status, stinging phacelia plants could be temporarily and permanently impacted during construction (Figures 3.17-6 and 3.17-7). However, with implementation of avoidance and minimization measures defined in Section 3.17.3.4 as well as compensatory measures for unavoidable impacts, adverse effects to stinging phacelia are not anticipated.

Other Actions Affecting the Resource

Other than the proposed project, plans that identify land use concepts for YBI and TI that could affect plant species include the SFOBB ESSSP and the TI/YBI Redevelopment Project. Since the SF Bicycle Plan would fall under the footprint of the TI/YBI Redevelopment Project and the West Span Bay Bridge Bicycle and Pedestrian Pathway is intended to be constructed along the existing west span structure of the SFOBB, these related actions are not focused on within the evaluation of cumulative plant species impacts.

Cumulative Impacts Assessment

Several biological studies conducted for the SFOBB project, TI, and YBI were reviewed to inform the plant species cumulative effects analysis. Full citations are provided in Section 3.17. As discussed in Section 3.17, focused surveys of the project area identified stinging phacelia. The combined construction efforts of the proposed project, SFOBB ESSSP, and the TI/YBI Redevelopment Project would have the potential to cumulatively impact stinging phacelia if they resulted in a reduction in the number of plants on the island. The combined construction efforts of the proposed project, SFOBB ESSSP, and the TI/YBI Redevelopment Project would have the potential to cumulatively impact stinging phacelia.

The proposed project would result in temporary and permanent impacts to stinging phacelia; however, the project would be required to implement the avoidance and minimization measures described in Section 3.17.3.3 and compensate for the permanent impacts through replacement. The SFOBB ESSSP and the TI/YBI Redevelopment Project would also be required to implement avoidance and minimization measures as well as compensation replacement for any impacts to stinging phacelia. Accordingly, cumulative impacts to stinging phacelia would not occur. Therefore, no cumulative impacts are anticipated to plant species within the project area.

3.20.4.4 Animal Species

RESOURCE STUDY AREA

For potential cumulative animal species impacts, the RSA encompasses all of YBI and TI, which are separated from other lands in the vicinity by the San Francisco Bay. As a result, YBI and TI are characterized by distinct wildlife relationships.

CURRENT HEALTH AND HISTORICAL CONTEXT

Based on habitat availability and as described below, various invertebrate, raptor, bird, and terrestrial animal species have been identified to have a low to moderate potential to occur on site. Per wildlife surveys and literature reviews, only a few of these species actually occur in the study area. Furthermore, the northern foredune plant community is a pioneer habitat that has and continues to represent potential habitat for several animal species. However, due to the constant wave action and shifting sands, this habitat typically has low species diversity.

SUMMARY OF IMPACTS OF THE PROPOSED PROJECT

Invertebrates

Based on habitat suitability, 26 invertebrate species were identified to have a potential to occur in the study area, because the study area contains habitat conducive to survival of these species. However, three of these species, the monarch butterfly, gummifera leaf cutter bee, and San Francisco lacewing, would have their respective habitat either temporarily or permanently impacted by the proposed project.

Fish

Project construction activities that involve loud equipment such as pile driving have the potential to cause barotrauma to fish species occurring within Essential Fish Habitat adjacent to the site. However, none of these activities will occur within aquatic habitats.

Raptors

Four raptor species were identified to have a potential to occur in the study area, because the study area contains habitat conducive to nesting of these species. However, three of these species, Cooper’s hawk, golden eagle, and white-tailed kite, would have their respective nesting habitat either temporarily or permanently impacted by the proposed project. The fourth species, the American Peregrine Falcon could also have its nesting habitat disturbed by construction-related noise and vibration.

Birds (Nonraptors)

Special-status passerine and nonpasserine landbird species, including bank swallow and Allen’s hummingbird, have the potential to nest within the study area. The remaining special-status bird species, as well as other common bird species that may nest on-site could be temporarily disturbed or unable to nest due to construction activity. Permanent removal of existing structures is not anticipated to have a long-term effect on habitat availability, as the proposed project would create new structures providing additional habitat for nesting birds such as house finches and swallows.

Project construction activities have the potential to disturb wading bird species that nest in mature woodlands, such as egrets and herons that attempt nesting within the project area and those that may be nesting adjacent to the site.

California brown pelican has the potential to occur within the study area and roost on piers and the sandy shoreline just outside the temporary and permanent project construction areas. Temporary disturbance to roosting pelicans could occur if construction activities encroach upon occupied roosting habitat. No permanent impacts to potential roosting areas are anticipated as the project construction footprint would avoid the piers in the Bay and the shoreline, including the northern foredune plant community.

Construction activities on or adjacent to the existing bridge structure could potentially disturb nesting double-crested cormorants and cause nest failure or abandonment. In addition, construction activities along the eastern border of the study area could potentially temporarily disturb roosting cormorants, if construction activities move outside of the construction envelope. The proposed project would have no permanent impact on cormorant roosting, nesting, or foraging habitat.

Terrestrial Mammals

Project construction activities have the potential to directly affect bats roosting within the project area and indirectly disturb those that may be roosting adjacent to the site through temporary and permanent removal of potential roost habitat. In addition, project construction activities have the potential to directly affect San Francisco dusky footed woodrats that occur within the project area and indirectly disturb those that may be utilizing woodlands and/or forests adjacent to the site through temporary and permanent removal of potential foraging and nesting habitat.

OTHER ACTIONS AFFECTING THE RESOURCE

Other than the proposed project, plans that identify land use concepts for YBI and TI that could affect animal species include the SFOBB ESSSP and the TI/YBI Redevelopment Projects. Since the SF Bicycle Plan would fall under the footprint of the TI/YBI Redevelopment Project and the West Span Bay Bridge Bicycle and Pedestrian Pathway would be constructed along the existing west span structure of the SFOBB, these related actions are not focused on within the evaluation of cumulative animal species impacts.

CUMULATIVE IMPACTS ASSESSMENT

Several biological studies conducted for the SFOBB project, TI, and YBI were reviewed in support of the animal species cumulative effects analysis. Full citations are provided in Section 3.17. The combined construction efforts of the SFOBB ESSSP and the proposed project may temporarily reduce availability of potential habitat for monarch butterflies, gummifera leaf-cutter bees, and San Francisco lacewing on the eastern portion of YBI as well as the total available potential habitat on the island. Additionally, the combined construction efforts of these projects may temporarily reduce nesting success of Cooper’s hawks, golden eagles, white-tailed kites, American peregrine falcon, passerine and nonpasserine landbirds, and wading birds on the eastern portion of YBI as well as the total available woodland habitat on the island. If the combined disturbance is great enough, cormorants may abandon nest and roost sites around the bridge, YBI, and TI. Construction activities may disturb the California brown pelican thereby causing the species to abandon roost sites throughout YBI and TI. If bat roosts are present, particularly a maternity roost site, the combined construction efforts may result in the loss of local bat populations. If present, the combined construction efforts may temporarily reduce the number of woodrats on the eastern portion of YBI as well as the total available woodland habitat on the island. The proposed project along with potential future construction projects, such as the SFOBB ESSSP and TI/YBI Redevelopment Project, could potentially result in cumulative effects to invertebrates, birds, bats, and mammals due to the overall reduction of habitat on YBI and the resulting decline in species population. The proposed project would implement avoidance and minimization measures as described in Sections 3.17.4.1 through 3.17.4.4. If needed, Caltrans would compensate for any permanent impacts on occupied habitat with 1:1 replacement. Similar measures are expected to be implemented by future projects; therefore, no cumulative impacts are anticipated to animal species within the study area.

The TI/YBI Redevelopment Project has been identified and considered throughout this Draft EIR/EIS. However, the potential for cumulative effects to the above-defined animal species associated with this proposed plan is speculative at this juncture. The implementation of specific features associated with the TI/YBI Redevelopment Project would be conceptual in nature. While a number of the plan features would likely include physical development and landform alteration, these elements have not been defined in detail and their locations are still undetermined. At this time the TI/YBI Redevelopment Project is not anticipated to result in a cumulative effect to any of the animal species discussed.

Therefore, no cumulative impacts are anticipated to animal species within the project area.

3.20.4.5 Threatened and Endangered Species

RESOURCE STUDY AREA

For potential cumulative threatened and endangered species impacts, the RSA encompasses all of YBI and TI, which are separated from other lands in the vicinity by the San Francisco Bay. As a result, YBI and TI are characterized by distinct habitat relationships.

CURRENT HEALTH AND HISTORICAL CONTEXT

The habitat on the project site is currently characterized as disturbed, proximate to existing construction associated with the SFOBB ESSSP, and lacking in suitability for threatened and endangered species. Furthermore, the project area has a history of being disturbed by human activity due to construction and maintenance of SFOBB and its associated YBI ramps. However, despite the existence of the SFOBB and its related to ongoing improvements at YBI since the 1930s, it has not caused adverse effects on threatened and endangered species in the Bay Area.

SUMMARY OF IMPACTS OF THE PROPOSED PROJECT

Plant Species

Based on habitat availability, four endangered or threatened plant species were identified to have a low to moderate potential to occur on-site. Because these target species were not found during focused surveys and are, therefore, presumed absent from the site, the project would have no effect on listed threatened and endangered plant species.

Fish

Eight Federally or state-listed fish species (listed in Section 3.17.5) were identified to have a potential to occur in the study area, because the study area falls within or in the vicinity of the historical range of these species. Based on the absence of suitable aquatic habitat, no fish species are expected to occur on-site, and the project would have no direct effect on listed threatened and endangered fish species. In addition, implementation of BMPs for aquatic habitats as described in Section 3.17.2.4 would ensure that fish species occurring in the Bay are not indirectly affected by project construction activities.

Reptiles and Amphibians

Two amphibian species and six reptile species that are Federally or state-listed (listed in Section 3.17.5) were identified to have a potential to occur in the study area, because the study area falls within or in the vicinity of the historical range of these species. Of these eight species, all were eliminated from consideration due to their range, isolation from known populations, or lack of suitable habitat. Because none of these reptile or amphibian species have potential to occur on or in the vicinity of the site, the project would have no effect on listed reptiles or amphibians.

Raptors

One state-listed endangered raptor species, the Bald eagle, was identified to have a potential to occur in the study area, because the study area falls within or in the vicinity of the historical range of this species. Since the nearest reported occurrence of bald eagle is more than 8.05 kilometers (5 miles) away (CDFG 2008a) and they are not known to nest in trees or structures adjacent to the Bay, (preferring lands with minimized human activity), bald eagles are not expected to occur on-site, and the project would have no direct effect on listed threatened and endangered raptor species.

Birds (Nonraptors)

One state-listed threatened landbird species, the bank swallow, was identified to have a potential to occur in the study area, because exposed vertical sandbanks found on the northern boundary of the study area provide nesting habitat for this species. Since the vertical banks would be avoided; the project would have no effect on listed threatened and endangered landbird species.

One state-listed threatened and a California Fully Protected marshbird species, the black rail, and one Federally and state-listed endangered and a California Fully Protected bird species, the California clapper rail, were identified to have a potential to occur in the study area, because they inhabit salt marsh habitats of the Bay and require dense vegetation for shelter and nesting. Since no suitable marsh habitat is present within the boundaries of the study area, the project would have no effect on listed threatened and endangered marshbird species.

One Federally and state-listed endangered and a California Fully Protected shorebird species, the California least tern, and one Federally-listed threatened and a California shorebird species of special concern, western snowy plover, were identified to have a potential to occur in the study area, because sand dunes on-site provide habitat. Since sand dune habitat on-site is minimal and exposed to wave action, making it unsuitable for nest establishment, permanent impacts to these shorebird species are not anticipated. In addition, implementation of BMPs for aquatic habitats as described in Section 3.17.2.4 would ensure that least tern prey fish in the Bay are not indirectly affected by project construction activities.

Terrestrial Mammals

One Federally and state-listed endangered and a California Fully Protected Species, salt marsh harvest mouse, was identified to have a potential to occur in the study area, because of the presence of occurrences nearby and because the study area falls within or in the vicinity of the historical range of this species. Due to the absence of suitable salt marsh habitat and isolation from known occurrences and lack of connectivity, this species is not expected to occur within the study area, and the project would have no effect on listed threatened and endangered terrestrial mammal species.

Marine Mammals

Nine Federally-listed marine mammal species (listed in Section 3.17.5) were identified to have a potential to occur in the study area, because the study area falls within or in the vicinity of the historical range of these species or the species have been identified as occurring near the study area. Of these species, only the humpback has been known to enter the Bay, but since it does not have the potential to occur in the vicinity of the study area, the project would have no effect on listed threatened and endangered marine mammal species. In addition, implementation of BMPs for aquatic habitats as described in Section 3.17.2.4 would ensure that Federally-listed marine mammal species occurring in the Bay are not indirectly affected by project construction activities.

Four marine mammal species that are not listed under either the CESA or the FESA but do receive protection under the Marine Mammal Protection Act (MMPA) were identified to have a potential to occur in the study area, because the study area falls within or in the vicinity of the historical range of these species or the species have been identified as occurring near the study area. Of these species, only the harbor seal, California sea lion, and gray whale have potential to occur in the vicinity of the study area, but since no work would be conducted within the limits of the Bay and no suitable aquatic habitat for foraging occurs on-site, the project would have no effect on marine mammal species protected under the MMPA. In addition, implementation of BMPs for aquatic habitats as described in Section 3.17.2.4 would ensure that marine mammal species occurring in the Bay are not indirectly affected by project construction activities.

OTHER ACTIONS AFFECTING THE RESOURCE

Other than the proposed project, plans that identify land use concepts for YBI and TI and could affect threatened and endangered species are the SFOBB ESSSP and the TI/YBI Redevelopment Project. Since the SF Bicycle Plan would fall under the footprint of the TI/YBI Redevelopment Project and the West Span Bay Bridge Bicycle and Pedestrian Pathway is intended to be constructed along the existing west span structure of the

SFOBB, these actions are not focused on within the evaluation of cumulative threatened and endangered species impacts.

Sea level rise associated with climate change could result in some island shore and, thus, marsh habitat, inundation. Since TI is primarily characterized by military development and YBI is characterized by areas of greater elevation (steep elevation changes from the island shore), there are no adequate areas for marsh habitat to retreat to if it were inundated.

CUMULATIVE IMPACTS ASSESSMENT

Several biological studies conducted for the SFOBB project, TI, and YBI were reviewed to inform the threatened and endangered species cumulative effects analysis. Full citations are provided in Section 3.17. As discussed in Section 3.17.5, most threatened and endangered species occurring in the region would not be directly or cumulatively affected by the proposed project, as it does not involve work within habitats suitable for threatened and endangered species. Although bank swallow have potential to nest on-site, there would be no cumulative impacts to these species with implementation of avoidance measures discussed in Sections 3.17.5.2 and 3.17.5.3.

Sea level rise would result in island shore inundation, which could lead to erosion and loss of marsh habitat, changing sediment demand, altered species composition, changing freshwater inflow and salinity, altered food web, and impaired water quality, all of which may overwhelm the system’s ability to rebound and continue functioning. Thus, marsh habitat and ecosystem health on YBI and TI could be adversely affected by climate change–induced sea level rise.

Since shoreline and marsh inundation as a result of sea level rise could degrade or eliminate habitat utilized by threatened and endangered marshbirds and shorebirds, a significant and unavoidable cumulative impact associated with threatened and endangered bird species within the project area is anticipated. However, the proposed project would not contribute to this significant and unavoidable cumulative impact, given that the operational effects of replacing the ramps would be similar to the current existing condition. Therefore, the proposed project’s contribution to the significant and unavoidable cumulative effect on threatened and endangered bird species would not be adverse.

3.20.5 Cumulative Impacts Results Summary

Table 3.20-2: Cumulative Impacts Results Summary Table

Caltrans Cumulative Impact Guidance Step	Visual Resources	Cultural Resources	Plant Species	Animal Species	Threatened and Endangered Species
1	Visual resources, cultural resources, plant species, animal species, and threatened and endangered species				
2: RSA	Eight key viewpoints	Six historic properties	All of YBI and TI	All of YBI and TI	All of YBI and TI
3: Current Health/Historical Context	Temporarily degraded aesthetics, due to SFOBB ESSSP construction	Removal of two historic properties since 1993	Two special-status plant species identified on site	Several special-status animal species known to occur on site	Habitat is disturbed, proximate to existing construction, and lacking in suitability
4: Summary of Proposed Project Impacts	Significant but Mitigable	Significant and Unavoidable	Significant but Mitigable	Significant but Mitigable	Significant but Mitigable
5: Other Actions Affecting the Resource	SFOBB ESSSP, TI/YBI Redevelopment Project, SF Bicycle Plan, and West Span Bay Bridge Bicycle and Pedestrian Pathway	SFOBB ESSSP and TI/YBI Redevelopment Project	SFOBB ESSSP and TI/YBI Redevelopment Project	SFOBB ESSSP and TI/YBI Redevelopment Project	SFOBB ESSSP, TI/YBI Redevelopment Project, and sea level rise in the Bay
6: Cumulative Impacts Assessment	No cumulative impacts	No cumulative impacts	No cumulative impacts	No cumulative impacts	Significant and Unavoidable; however, no project contribution
7: Cumulative Impacts Results Summary	This table				
8: Mitigation of Cumulative Impacts	None required				

3.20.6 Mitigation of Cumulative Impacts

As no significant cumulative impacts were identified as a result of the proposed project in this document, no further mitigation beyond that identified in the relevant EIR/EIS sections is necessary.

CHAPTER 4 – CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) EVALUATION

This chapter describes the potential environmental effects identified in Chapter 3 that would be considered significant under CEQA. This combined Draft EIR/EIS has been prepared in accordance with CEQA and NEPA. SFCTA is the project sponsor and, per a memorandum of understanding with Caltrans, they are the lead agency under CEQA. CEQA requires that identification of the level of significance for each impact be stated in an EIR, while NEPA regulations do not require such a discussion. Because of this difference, the CEQA significance criteria and the determination of significant impacts have not been included in other sections of this combined Draft EIR/EIS. These criteria and determinations are identified and described in this chapter. Appendix A contains a CEQA checklist of project impact determinations made as part of the Initial Study.

4.1 Determining Significance under CEQA

The project is subject to Federal as well as SFCTA and state environmental review requirements because the SFCTA proposes the use of Federal funds and/or the project requires a Federal approval action. Project documentation, therefore, has been prepared in compliance with both CEQA and NEPA. The SFCTA is the lead agency under CEQA. Environmental review, consultation, and any other action required in accordance with NEPA and other applicable Federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or some lower level of documentation, would be required. NEPA requires that an EIS be prepared when the proposed Federal action (project), *as a whole*, has the potential to "significantly affect the quality of the human environment." The NEPA determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require the project sponsor(s) to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR, and mitigated if feasible. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the mandatory findings of significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

The CEQA Guidelines (§15000, et seq., California Code of Regulations, 2001) define a "significant effect" as:

> …a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land,

> air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant (CEQA Guidelines §15382, 2001).

The CEQA Guidelines further state that “An ironclad definition of significant effect is not possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area” (CEQA Guidelines §15064, 2001). Appendix G of the CEQA Guidelines describes impacts that the California Resources Agency has determined are normally considered significant. These guidelines require that physical changes in the environment be evaluated based on factual evidence, reasonable assumptions supported by facts, and expert opinion based on fact.

4.2 Discussion of Impact Significance

Analysis of the project alternatives was conducted to determine if there would be an impact on a particular environmental resource. This review included a determination of whether an impact occurring from the implementation of an alternative would be rated as “significant” under CEQA. Levels of significance stating “less than significant with mitigation incorporated” are based on the application of successful mitigation measures meaning the impact would not be mitigated until mitigation successfully accomplishes the desired goals.

Chapter 3 provides a detailed discussion of the impacts for each resource category. Significant impacts were not identified for the No Build Alternative, which is used as the existing condition for comparison with the build alternatives.

4.3 No Impacts of the Proposed Project

The proposed project would have no impacts to parks and recreation, community, emergency services and utilities, and energy. These resource areas are also discussed in Section 3.2, Parks and Recreation; Section 3.4 Community Impacts; Section 3.5, Emergency Services and Utilities; and Section 3.16, Energy.

4.3.1 Parks and Recreation

The project site is not within an existing regional park and does not contain any recreational facilities. As discussed in Section 3.2, no recreational facilities would be removed as part of either build alternative. Neither build alternative would impact parks and neither interferes with the City’s plans for a balanced park system.

Consistent with objectives in the City of San Francisco General Plan, both build alternatives would maintain adequate open space along the shoreline. The provision of this open space involves meeting the goals for implementing TI/YBI Development Plan, which has proposed to redevelop 121.41 hectares (300 acres) of open space on TI/YBI with waterfront promenades, bicycle and pedestrian paths, recreational and entertainment facilities, restaurants, shops, hotels, residences, and other public uses for facilities and areas previously used by the U.S. Navy. Water-oriented recreational facilities would continue to be accessible to the public and consistent with the San Francisco Bay Conservation and Development Commission's *The Bay Plan.*

Neither build alternative is expected to generate a greater demand on existing or future recreational facilities at YBI and TI. Neither alternative would remove existing recreational facilities nor preclude the future development of recreational opportunities set forth in the TI/YBI Redevelopment Plan. No impacts to recreational facilities would occur.

4.3.2 Community

The build alternatives would occur within existing and proposed Caltrans right-of-way. As discussed in Section 3.4, no occupied structures would be removed or relocated either temporarily or permanently as part of either build alternative. As such, there are no residents in the project area and minority or low-income populations would not be affected.

Alternatives 2b and 4 would not have disproportionately high or adverse impacts on low-income or minority populations in the project area. No impacts would occur.

4.3.3 Emergency Services and Utilities

As discussed in Section 3.5, temporary impacts to emergency services would occur under the build alternatives during construction. Construction activities would result in temporary detours and single-lane closures. However, these impacts would be minimized through coordination with the USCG and emergency service providers. The proposed detour would be part of the TMP, which would be required to be reviewed and approved by the SFFD and USCG. Implementation of the TMP would result in less than significant impacts to emergency services.

It is anticipated that certain components of the utility system on YBI and TI would need to be temporarily relocated as part of the YBI Ramps Improvement Project. In those instances, temporary facilities would be provided during construction to maintain continuous utility operations. As discussed in Section 3.5, there would be no impacts to the utility system under the build alternatives as continuous service is planned to be maintained during construction. In some cases, where allowable, utility elements may be relocated before the initial construction phase.

Both build alternatives would include the permanent relocation of gas and sewer lines. All utility relocations would be conducted in coordination with the applicable provider. As such, no impacts related to utility relocations would occur.

4.3.4 Energy

The indirect energy consumption of the No Build Alternative would only be associated with the manufacturing and maintenance of passenger vehicles, heavy trucks, and transit buses. As discussed in Section 3.6, the long-term LOS under the No Build Alternative would be expected to worsen over existing conditions and delays and queues on YBI would increase as the demand would exceed the capacity of the ramps. Accordingly, energy consumption would increase.

The build alternatives would be conserving natural resources and limiting energy consumption in several ways. The increased on- and off-ramp capacity and improved geometry would reduce travel times for motorists on the SFOBB mainline, which would provide for less vehicle operating time which, in turn, reduces wear on the vehicles and reduces fuel consumption. Additional savings on the SFOBB mainline would result from fewer vehicle stops and starts (which is the most wasteful condition in terms of fuel). Energy consumption on the islands would be expected to increase as a result of the build alternatives, as queuing and delays would occur due to the increased capacity of the on-ramps. To improve traffic flow on the islands, the ramps would be metered. Metering the ramps as a system would allow Caltrans to optimize the efficiency of the on- and off-ramps access.

It is Caltrans' goal to construct this proposed project in the least amount of time by planning and staging the work efficiently. Short-term energy consumption would increase due to construction. The reduced construction time would lead to a low number of construction-related delays and make the benefits of the project available sooner. Caltrans is also proposing to reuse and incorporate existing materials (those that can be) into the final product. Any pavement and construction debris that is removed would be considered for recycling or reuse. Recycling saves the fuel and materials that would have been required to create new materials.

The design of each build alternative would also reflect an attempt to reduce the number of utilities that need to be either relocated or replaced as part of the project. Where possible, utilities would be left in place and incorporated as part of the project.

Caltrans has recently identified ways to incorporate a green construction fleet and is developing construction specifications by which construction-related emissions would be reduced. The Caltrans Fleet Greening Program goal is to promote an efficient fleet mix and use of efficient, low-emission vehicles to lower Caltrans' use of petroleum as well as reduce emissions of criteria air pollutants and greenhouse gases (Caltrans 2010b). The green fleet includes hybrid passenger vehicles, solar-powered equipment, propane-fueled vehicles, low dust street sweepers, and diesel particulate filters on heavy-duty, diesel-powered vehicles (Caltrans 2010b). To the extent possible and appropriate, the green specifications would be considered for incorporation into the various construction contracts to build the project. As such energy consumption would be less than under existing conditions. Therefore no impacts to energy would occur.

4.4 Less-Than-Significant Effects of the Proposed Project

The proposed project would have a less-than-significant effect on land use, growth, traffic, hydrology and floodplains, water quality and storm water runoff, geology and soils, hazardous waste/materials, air quality, noise, and biological resources. These resource areas are also discussed in Section 3.1, Land Use; Section 3.3, Growth; Section 3.6, Traffic and Transportation/Pedestrian and Bicycle Facilities; Section 3.9, Hydrology and Floodplains; Section 3.10, Water Quality and Storm Water Runoff; Section 3.11, Geology/Soils/Seismic/Topography; 3.12, Paleontology, Section 3.13, Hazardous Waste/Materials; Section 3.14, Air Quality; Section 3.15, Noise; and Section 3.17, Biological Environment.

4.4.1 Land Use

The proposed project's build alternatives (2b and 4) would occur on YBI within future Caltrans right-of-way. The project build alternatives would replace existing on- and off-ramps that occupy some of the same land. Some additional land would be necessary to allow for the column foundations for the ramp structure. For Alternative 2b, Quarters 10 (and Building 267) would be removed and relocated. As discussed in Section 3.1, no conflict with existing land uses would occur.

Future land uses including institutional, open space, and mixed-use classifications are planned but not designated at locations beneath the proposed on- and off-ramps in the TI/YBI Redevelopment Project, which is under environmental review. These land uses would only be affected at areas where the columns were located and where the ramp would meet grade along Macalla Road. There are currently existing on- and off-ramps in these locations. The proposed project's build alternatives would occur within existing Caltrans right-of-way. The YBI Ramps project is necessary to improve the functional roles of the current ramps and requires adequate land to build a new facility. Land use impacts would be less than significant.

4.4.2 Growth

4.4.2.1 Temporary Impacts

Implementation of either build alternative would induce a minimal amount of temporary growth at the project site. As discussed in Section 3.3, over the short-term, project construction activities would require the establishment of temporary small-scale office facilities at the project site for construction personnel during working hours. These facilities would comprise the extent of growth (on a temporary basis) that would result from implementation of the YBI Ramps Improvement Project. These facilities would be used during the project implementation period and removed from the site once construction activities are completed. Workers would be from the existing labor pool within San Francisco and Alameda counties and the Bay Area, and would not require the relocation or influx of additional population to staff the construction efforts. As such, the build alternatives would not result in temporary growth beyond the minimal amount associated with construction and impacts would be less than significant.

4.4.2.2 Permanent Impacts

Neither build alternative would induce unplanned growth, either directly or indirectly, in the area. The project would improve acceleration and deceleration distances to and from SFOBB's highway lanes. The project would replicate the functional roles of the current ramps and would not place a new permanent facility in an undeveloped area nor would it expand or increase roadway capacity. However, as stated in Section 3.6, Traffic and Transportation/Pedestrian and Bicycle Facilities, of this Draft EIR/EIS, the build alternatives would increase the capacity of the existing on- and off-ramps; however, the increase would be constrained by ramp metering. Therefore, neither build alternative would result in the inducement of direct or indirect permanent unplanned growth in the project area. Impacts to growth would be less than significant.

4.4.3 Traffic

This section identifies potential impacts that may occur during construction of the build alternatives.

As discussed in Section 3.6, construction vehicles, equipment, and workers would traverse the project area, resulting in temporary traffic and circulation impacts.

Project construction would involve demolition, excavation, new ramp structures, a roadway, sidewalk, retaining wall, landscaping, and signage. Construction vehicles include trucks hauling debris and delivering construction materials and supplies, graders and heavy earth-moving and paving equipment, and vehicles transporting by construction workers.

As described in Section 3.6.4.1, during project construction, the following minimization measures would be implemented to concentrate the majority of road closures and construction activity during off-peak hours to reduce traffic impacts. During the lane closure on Macalla Road, traffic would be diverted to one side of the road and traffic would be controlled by flaggers stationed at both ends of the closure. Similar traffic handling is currently being used on Macalla Road with the ongoing SFOBB construction by Caltrans. Macalla Road primarily serves the USCG facility. Therefore, road closures would be subject to USCG lane closure restrictions. During closure of the existing westbound on-ramp, traffic would be diverted to the westbound on-ramp on the west side of YBI, utilizing Macalla Road and Treasure Island Road. During final design, specific construction procedures and routes will be defined and identified in the Transportation Management Plan (TMP) prepared for the project. Traffic impacts during the various construction stages would be temporary. However, implementation of the TMP during construction would reduce temporary impacts to less-than significant levels.

4.4.3.1 Future Trip Demand on YBI and TI

Future trip demand volumes were estimated for baseline transit investments only (only those funded improvements were included in the modal split analysis). Table 3.6-4 in Chapter 3.6, Traffic and Transportation/Pedestrian and Bicycle Facilities, presents the proposed land use program for the TI/YBI Redevelopment Plan and estimated person and vehicle trips for this plan under the baseline transit scenario. The table shows the TI/YBI Redevelopment Plan would generate approximately 2,416 vehicle trips during the AM peak hour (1,062 inbound and 1,354 outbound vehicle trips) and approximately 3,835 vehicle trips during the PM peak hour (2,136 inbound and 1,699 outbound vehicle trips). It should be noted that the vehicle trips presented in Table 3.6-3 are total vehicle trips generated by the proposed developments on TI and YBI at build-out and include vehicles currently accessing the islands. These trips would continue after implementation of the TI/YBI Redevelopment Plan project. The net increase in vehicle volumes would be 1,664 vehicles during the AM peak hour and 2,909 vehicles during the PM peak hour, which would significantly impact the local road network. Under the 2035 Build Condition with Ramp Metering, long delays and queues would be expected on the island. However, additional roadway improvements would not be implemented to accommodate these queues, which would occur only on the approaches to the meters and thus would not substantially impair circulation on YBI. Therefore, island roadways, such as Macalla Road and Treasure Island Road, would not need to be widened to accommodate projected traffic volumes. Table 3.6-8 summarizes the results of the 2035 Build Condition analysis for the ramp junctions with ramp metering. When compared with the results in Table 3.6-7, the project with ramp metering is expected to improve conditions at the westbound on-ramps to LOS C (from LOS E/F) during both the AM and PM peak hours.

As described in Section 3.6.4.2, the analysis with no ramp-metering concludes that the average operating speed on the SFOBB would be lower because the capacity of the new on-ramp would increase to 1,200 vph from 330 vph. With no ramp metering, on-ramp traffic would be allowed to enter the mainline unimpeded, thus reducing queuing on the on-ramp and YBI. After construction, ramp metering will be in effect, which may cause long delays and queues on the ramp and YBI. With ramp metering, the metering rates can be coordinated such that the number of vehicles entering the mainline would be based on the number of vehicles exiting the mainline. Additionally, the mainline metering lights at the Oakland touchdown would be coordinated with the on-ramp, such that the traffic entering the mainline would be reduced to increase the metering rate of the on-ramp, and vice versa. Implementation of ramp metering and coordination with the mainline metering lights at the Oakland touchdown would reduce traffic impacts to a less-than-significant level.

4.4.4 Hydrology/Water Quality

For the purpose of this discussion and in conformance with CEQA format, hydrology/water quality includes hydrology, floodplains, water quality, and storm water runoff. Potential impacts to these resource areas are covered separately in Section 3.9, Hydrology and Floodplains, and Section 3.10, Water Quality and Storm Water Runoff.

There is the potential that the discharge of dewatering effluent or runoff from the proposed build alternatives (either during the construction or operation periods), including sediment and/or urban pollutants above allowable regulated thresholds, may affect receiving waters.

4.4.4.1 Flooding

As described in Section 3.9, Hydrology and Floodplains, the proposed ramps for both build alternatives do not encroach upon any existing FEMA-mapped floodplains. Any roadways below 2.5 meters (8.2 feet) NGVD could be inundated during the 100-year tsunami wave run-up event. By the year 2050, the inundation elevation is expected to rise incrementally to 2.65 meters (8.7 feet) NGVD.

Based on review of available topographic data, the surface elevations of the proposed ramps are above an elevation of 2.65 meters (8.7 feet) NGVD. In low-laying areas and dips along YBI, the roadway ramps are raised via pile foundations well above an elevation of 2.65 meters (8.7 feet) for both alternatives. Therefore, impacts to the roadway from inundation during one of these unusual and extreme events would be less than significant.

4.4.4.2 Hydrology

Alternative 2b would add 2.52 hectares (6.23 acres) of additional surface pavement area compared with existing conditions. This additional impervious surface would increase surface runoff by 0.03 m^3/s (1.06 ft^3/s).

Alternative 4 would add 2.88 hectares (7.12 acres) of additional surface pavement area compared with existing conditions. This additional impervious surface would increase surface runoff flows by 0.04 m^3/s (1.4 ft^3/s).

As described in Section 3.9, bioswales would be designed to capture the increased flow rate due to the additional impervious surface for both alternatives. Impacts to hydrology would therefore be less than significant.

4.4.4.3 Water Quality

Alternative 2b would add 2.52 hectares (6.23 acres) of additional surface paving area compared with existing conditions. This additional impervious surface would increase surface runoff flows by 0.03 m^3/s (1.06 ft^3/s).

Alternative 4 would add 2.88 hectares (7.12 acres) of additional surface paving area compared with existing conditions. This additional impervious surface would increase surface runoff flows by 0.04 m^3/s (1.4 ft^3/s).

As discussed in Section 3.10, both build alternatives include an independent ramp drainage system to collect all ramp surface runoff. Slopes would include pipe or flume downdrains to collect concentrated flow and minimize erosion. Currently, surface runoff from the westbound lanes of I-80 is collected in deck drains on the side of the SFOBB. Because Alternative 2b would provide treatment for runoff, sediment loading in surface runoff would be reduced compared to existing conditions where runoff flows over exposed soil without treatment.

Although storm water runoff would contain pollutants generated by automotive vehicles over paved surfaces, after construction, traffic is not expected to increase substantially when compared with existing conditions. Following water quality treatment, the runoff would not be expected to contain detectable amounts of any of the pollutants of concern listed in the 303(d) for the Central San Francisco Bay. In this instance, storm water treatment target pollutants related to traffic are not entirely covered in the 303(d) list. The Caltrans statewide permit and SWMP call for the consideration of permanent BMPs, including treatment to control runoff after project construction. Preliminary treatment options for the proposed raps were narrowed down to bioswales, which would collect flows from the proposed roadways and treat the runoff prior to discharge. Compliance with applicable regulations and implementation of a SWPPP for construction-related storm water runoff impacts and the Caltrans General Permit and SWMP to control runoff after project construction would result in less-than-significant water quality impacts.

4.4.5 Geology and Soils

According to geotechnical data collected during analysis of the SFOBB ESSSP, several slope stability issues were associated with design of the East Span structures on and in the vicinity of YBI (Caltrans 2001a). These issues included the stability of the east-facing slope of YBI and the potential for slope failures in the vicinity of the west foundation for the SFOBB East Span.

As discussed in Section 3.11, there are pre-existing slope stability and erosion problems on parts of YBI in the vicinity of the USCG facility. Slope stability issues for the SFOBB ESSSP were evaluated through geologic mapping performed on YBI, marine exploration, and laboratory testing of bedrock. Stability analyses for various potential slope failure modes were performed. The results showed that wedge failures were anticipated on YBI. Based on the preliminary foundation report for the YBI project (Draft Preliminary Foundation Report – Yerba Buena Island Interchange Ramp Project, San Francisco Bay Bridge, California, April, 2007) and preliminary engineering design, pile driving will be used to construct some column foundations. The proposed new structures are planned to be supported on 610-mm (24-inch) diameter columns, 2,440 to 3,050-mm (96 to 120-inch) diameter drilled shafts, or other types of piles. Pre-cast concrete (PCC) piles or other types of driven piles may be used. This construction technique could result in ground-transmitted vibration, which could affect soil stability as well as structural stability and wildlife behavior.

As described in Section 3.11.4.1, the site-specific preliminary foundation memorandum (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010) contains construction recommendations for earthwork (cuts, fills, and finished slopes), pile construction (driven or drilled piles), and abutment walls. These recommendations take into account the geologic and soil conditions at the project site, previous studies, and current requirements of Caltrans Standard Specifications and are based on the preliminary construction plans. The site-specific foundation report also recommends review of the final construction plans and specifications by a geotechnical consultant to confirm inclusion of these recommendations, as well as inspections and testing during several stages of construction.

As described in Section 3.11.4.1, the following minimization measure would be implemented to avoid impacts related to geology and soils. Final determination of specific construction activities at the project site would occur once a preferred project alternative is identified. Once an alternative has been selected, SFCTA, in conjunction with Caltrans, would retain California-licensed geologists and geotechnical engineers to assist in final design and review the final construction plans and specifications to confirm inclusion of recommendations from the preliminary foundation memorandum (Preliminary Foundation Memorandum – Yerba Buena Island Ramps Improvement Project On East Side of the Island, Oakland, California, 2010). Caltrans would document compliance with this measure prior to the final project design. The engineers would prepare a summary report that would document the investigation and detail the specific design support alternatives and protection measures that would be implemented. The geotechnical engineer would conduct inspections and testing during the following stages of construction: grading operations, including excavations and compacted fill placement; shoring installation; CIDH drilling prior to replacement of steel reinforcement; preparation of subgrade prior to placement of any overlying materials; foundation construction; backdrain construction, and when any unusual subsurface conditions are encountered.

Implementation of the avoidance and minimization measures above and compliance with required laws and regulations through the project design would ensure that potential impacts associated with geology and soils would be reduced to less-than-significant levels.

4.4.6 Paleontology

As discussed in Section 3.12, the paleontologically sensitive Franciscan Complex/Alcatraz Terrane can be found directly underneath the paleontologically sensitive Colma Formation, and both would be affected by construction activities. Ground-disturbing activities within the PSA for both build alternatives could potentially impact paleontological resources. As described in Section 3.12.4, potential impacts to paleontological resources during construction activities would be mitigated by development of a Paleontological Mitigation Plan (PMP), retaining a qualified principal paleontologist (MS or PhD in paleontological procedures and techniques) who would review the selected alternative alignment and design, once a preferred project alternative is identified; determine the potential for disturbance of the paleontological resource; and identify specific mitigation measures as needed. In addition, onsite training and monitoring of project-related ground-disturbing activities would occur. Impacts to paleontological resources would therefore be less than significant with mitigation.

4.4.7 Hazardous Waste/Materials

As described in detail in Section 3.13, parts of Installation Restoration (IR) Site 8 (a sludge spreading area), IR Site 11 (a landfill), and IR Site 29 (an area of known soil contamination possibly associated with former military operations or highway operations) are within the project site. Site 270 (a closed leaking underground storage tank [LUST]) is also within the project area. Soil and groundwater contamination by petroleum hydrocarbons, heavy metals, volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs), and pesticides have been found on the IR sites. Construction activities associated with Alternative 2b could expose construction workers to the contaminated soil of IR Site 29. Surface and shallow subsurface soil sampling and testing determined that the soil adjacent to the SFOBB bents and columns has been contaminated by metals associated with past bridge maintenance and operations, and also by petroleum hydrocarbons at select locations.

As discussed in Section 3.13, Alternative 2b would also result in construction workers encountering IR Site 8, the former U.S. Army Point Sludge Disposal Area located in the vicinity of the Alternative 2b ramps alignment. Surface and shallow subsurface soil sampling and testing determined that the former sludge drying site is impacted by the presence of materials, especially beryllium and lead as chemicals of concern, as well as the presence of pesticides. Worker and public health issues during construction are a potential concern. Exposure pathways due to heavy construction traffic under dry, dusty conditions would include direct contact through ingestion, dermal contact, or inhalation.

Implementation of this alternative would involve relocation of Quarters 10/Building 267, both historic structures, to construct the alignment of the proposed ramps. Given the age of these buildings, it is expected that relocation could expose workers to hazardous materials such as asbestos and LBP, if this procedure disturbs these materials. However, as of 2002, all known damaged, friable, or accessible ACM has been abated in these buildings; remaining ACM does not pose a threat to human health (U.S. Navy 2008).

All known instances of LBP and ACM at YBI have been abated and removed (U.S. Navy 2008). The measures listed below in Section 3.13.8.2 would be applied to ensure safety from any ACM that may be discovered if the buildings were moved and avoid potential impacts. Contract specifications for relocation of Quarters 10/Building 267 would include procedures for the abatement, handling, and disposal of LBP and ACM (if this proves necessary during building relocation activity), as well as the health and safety of workers and nearby residents (including USCG and U.S. Navy personnel). Prior to building relocation, ACM and LBP surveys would be performed to identify these materials. All procedures and permitting requirements would be consistent with Caltrans' guidelines and all Federal, state, and local laws and regulations and coordinated with responsible parties and regulatory agencies. Notices and restrictions related to asbestos were identified in the U.S. Navy's Finding of Suitability to Transfer (FOST) for YBI dated March 23, 2006, and these restrictions would be complied with during construction and operations.

If surveys identify additional sources of LBP and/or ACM, workers performing activities on-site that may involve contact with contaminated soil, LBP, ACM, or groundwater would be required to have appropriate health and safety training in accordance with Federal and state regulations. To reduce the risk of exposure, a Worker Health and Safety Plan will be prepared and implemented during construction by a Certified Industrial Hygienist (CIH). The Health and Safety Plan would meet requirements of the Bay Area Air Quality Management District for asbestos abatement and will include provisions for:

- Conducting preliminary site investigations and analysis of potential job hazards, including identification and removal of the potential UST;
- Personal protective equipment;
- Safe work practices;
- Site control;
- Exposure monitoring;
- Decontamination procedures; and
- Emergency response actions.

The plan would address reduction of potential worker, U.S. Navy and USCG personnel, and public exposure to airborne contaminants by incorporating dust suppression techniques in construction procedures. Procedures would be in place to handle contaminated soils and groundwater, and if encountered, would follow applicable regulations. As discussed in Section 3.13, construction activities associated with Alternative 4 would result in the same impacts identified for Alternative 2b described above (except for impacts resulting from relocation of Quarters 10/Building 267), given that the ramps alignment proposed for Alternative 4 includes a large part of the area that would be covered by the Alternative 2b alignment. However, given that Alternative 4 would cover additional parts of YBI, exposure by workers to hazardous wastes located elsewhere in the project area could occur if Alternative 4 was implemented.

The SFOBB ESSSP HWA identified a groundwater petroleum plume associated with a LUST at Building 270. According to that report, the extent of the plume was undefined and additional sampling and testing were proposed. Three permanent groundwater monitoring wells installed at this location indicated that the groundwater table ranges from 1.5 to 1.83 meters (4.9 to 5.9 feet) above mean sea level. Analytical results indicated elevated concentrations of TPH/diesel (160,000 µg/l) and TPH/gasoline (7,300 µg/l) in the upgradient monitoring well. IR Site 11, the former landfill, was identified as a potential source of these contaminants in the upgradient monitoring well.

Construction impacts may also be of concern because the former fire station/gas station site at Building 204/208 appears to be located upgradient from Building 270 where a possible source of groundwater contamination was identified in the groundwater monitoring well. This alternative may result in impacts on workers if construction activity occurs in this area.

The Phase I ISA for the YBI project includes the following findings as a result of ongoing investigations and remediation by the U.S. Navy at these sites:

- The extent of contamination has been delineated but Remedial Investigations (RIs) for IR 8, 11, and 29 are pending as of June 2010.
- Several other military sites are located on the western side of YBI or on TI. The potential for impact to the project site from these other sites appears to be low due to distance.
- The presence of documented soil and groundwater contamination at the three IR sites within the project area constitutes a Recognized Environmental Condition pertaining to the project site.
- IR Site 270, which received a No Further Action letter in 2004, constitutes a Historical Recognized Environmental Condition. No immediate environmental concerns are evident in regard to this former LUST.

The U.S. Navy has determined the extent of contamination, and RIs are under way for IR Sites 8, 11, and 29; the U.S. Navy is in discussions with Caltrans about property transfer. Notices and restrictions related to asbestos were identified in the U.S. Navy's Finding of Suitability to Transfer (FOST) for YBI dated March 23, 2006, and these restrictions would be complied with during construction and operations.

Impacts related to the use and transport of hazardous materials or the disturbance of hazardous waste sites would be limited to the construction period. Although a release of hazardous materials during the construction period may potentially have long-lasting effects, construction phase BMPs and Phase 1 Hazardous Materials Site Assessment would be implemented to address this potential issue. As described in Section 3.13.8.1, the following measures would be implemented to avoid hazardous waste/materials impacts during construction. Final determination of specific construction activities planned on or near a potential contaminant source would occur after the preferred project alternative is identified. Once a preferred alternative is identified, additional site-specific delineation of any remaining areas of unabated contamination will be performed to finalize details of construction, to detail procedures for handling of contaminated media, and to ensure worker safety during construction. This would include performance of a Phase 1 Hazardous Materials Site Assessment by a qualified professional (e.g., a California Registered Environmental Assessor) in conformance with American Society for Testing and Materials standards. If the Phase I Environmental Site Assessment indicates that a previous release of hazardous materials could have affected soil or groundwater quality at the site, then Caltrans would retain a qualified environmental professional to conduct a Phase II Environmental Site Assessment to determine the presence and extent of contamination at the site, in conformance with state and local guidelines and regulations. If the results of a Phase II assessment indicate the presence of hazardous materials, alteration of the project's design or site remediation would be included in project specifications. The SFCTA also requires that its contractors comply with applicable requirements for worker safety during construction activities in the presence of contaminated soils. Compliance with required laws and regulations through the project design and construction specifications would ensure that potential impacts associated with contaminated soils would be reduced to less-than-significant levels.

4.4.8 Air Quality

4.4.8.1 Temporary Impacts

As discussed in Section 3.14, under the two build alternatives, construction activities would generate emissions of criteria air pollutants and precursors from various sources. The proposed build alternatives would require demolition of existing ramp structures, site grading, construction of the proposed ramps, and asphalt paving for the new roadway surfaces. Demolition and grading activities that include disturbance of existing ramp structures or exposed soil would generate fugitive PM_{10} dust emissions. Heavy-duty off-road construction equipment used for demolition, grading, construction, and asphalt paving would generate exhaust emissions of criteria air pollutants and precursors. Additional exhaust emissions would be generated from material delivery trucks, construction worker vehicles, and, if needed, on-site generators. In addition, the application of asphalt for roads and, if required, the architectural coatings for structures would generate off-gas emissions of ROG.

Because the use of off-road heavy-duty diesel equipment would be temporary in combination with the highly dispersive properties of diesel PM (2002) and further reductions in exhaust emissions from regulatory programs and requirements (e.g., Clean Air Nonroad Diesel Rule and ARB tier standards), project-generated, construction-related emissions of TACs would not expose sensitive receptors to substantial emissions of TACs.

According to *A General Location Guide for Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos* (CDC 2000), the project site is not located in an area that is likely to contain naturally occurring asbestos. Thus, hazardous exposure to asbestos-containing serpentine materials would not be a concern with the proposed project.

Certain building structures (on YBI) and the on- and off-ramp structures could potentially include ACM that would be disturbed and emitted into the atmosphere during construction of the proposed project. As discussed in Chapter 3.13, Hazardous Waste/Materials, the 2008 Site Management Plan has abated all known ACM on the YBI and TI areas, including Quarters 10 and Building 267, which would be relocated as part of Alternative 2b. Therefore, the proposed project would not expose any receptors or workers to naturally occurring or structural asbestos. Impacts would be less than significant.

Construction of the new ramps may generate odors associated with exhaust emissions from heavy-duty diesel construction equipment; however, these sources would be intermittent and temporary in nature. Therefore, temporary construction activities are not anticipated to cause a significant source of odiferous compounds.

Construction activities under the two build alternatives would generate emissions of criteria air pollutants and precursors from various sources. As described in Section

3.14.5, potential impacts during construction activities would be avoided by implementing control measures recommended by the BAAQMD to minimize the generation of PM_{10} dust emissions. In addition, the contractor would be required to implement these "Basic Control Measures" during all construction activities. The abatement measures listed in the *Yerba Buena Island Ramps Improvement Project Air Quality Analysis* (Appendix L) are also required to be implemented during construction activities. In addition, the project site is approximately 1.62 hectares (4 acres); therefore, according to the BAAQMD CEQA Guidelines, the contractor is required to implement the BAAQMD's "Enhanced Control Measures."

The following "Basic Control Measures" are required for all construction activities:

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 61 centimeters (24 inches) of freeboard.
- Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

These additional "Enhanced Control Measures" should be implemented if the project site would exceed 1.62 hectares (4 acres):

- Include all "Basic" control measures listed above.
- Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
- Enclose, cover, water twice daily, or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.)
- Limit traffic speeds on unpaved roads to 24 kilometers (14.9 miles) per hour.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

Implementation of these minimization measures would ensure that potential air quality impacts associated with construction would be less-than-significant.

4.4.8.2 Permanent Impacts

A project's regional air quality impacts would be significant if the proposed project is not included in the most recent RTP and RTIP. As discussed in the *Yerba Buena Island*

Ramps Improvement Project Air Quality Analysis (Appendix L), the proposed project is included in the 2035 RTP, which was found to meet the transportation conformity provisions of the national CAA by MTC on April 22, 2009. The project is also included in MTC's financially constrained 2009 TIP, which was found to conform to the CAA requirements by FHWA and FTA on November 17, 2008.

As discussed in Section 3.14, a qualitative analysis for a potential CO hot spot as a result of the proposed project was performed using the Transportation Project-Level Carbon Monoxide Protocol (ITS 1997). The analysis determined that the proposed project would not generate additional vehicle trips that would increase CO concentrations at local intersections.

The proposed project would replace the YBI on- and off-ramps, which do not have and are not expected to have an AADT over 125,000 during current and future conditions. In addition, the proposed project would not increase the percentage of diesel truck traffic traveling along the ramps. The project would also not involve any bus or rail terminals, and transfer points. Therefore, the project is would not be considered a POAQC.

The proposed project is located in an attainment area for the PM_{10} and a nonattainment area for the $PM_{2.5}$ NAAQS. With respect to the CAAQSs, the SFBAAB is designated as a nonattainment area for PM_{10} and $PM_{2.5}$. Based on screening using USEPA PM Guidance, the proposed project is not a POAQC because it does not meet the criteria described above. The proposed project is therefore in conformance for the PM_{10} and $PM_{2.5}$ NAAQS and is unlikely to increase the frequency or severity of any existing exceedance regarding the nonattainment of state PM_{10} and $PM_{2.5}$ standards.

The build alternatives are not expected to result in a substantial increase in MSAT emissions because the new ramps would not generate additional vehicle trips, result in increased VMT, or change the types of vehicles using the YBI on- and off-ramps. A localized increase in MSAT emissions may occur where vehicles queue at the metering light on the YBI on-ramp. However, this increase would be nominal and partially offset by the reduction in the level of congestion experienced by traffic traveling on the segment of the SFOBB between the on- and off-ramps. Furthermore, the potential, localized increase in MSAT concentrations near the metering light would not likely result in increased concentrations of MSAT emissions at the nearest sensitive receptor, the residential unit that is located approximately 198 meters (649.6 feet) away from the proposed on-ramp location. Therefore, all the proposed alternatives would be considered to have low potential MSAT effects.

The proposed project does not include any land uses that would generate offensive odors. In addition, the new ramps would not encourage heavy-duty diesel truck traffic that could potentially be a permanent source of odors. Therefore, it is not anticipated that the proposed project would generate or cause an increase in odiferous compounds in the project area. Impacts would be less than significant.

4.4.9 Noise

As described in Section 3.15, the primary result of noise level increase would from increased traffic volumes that would occur between the present time and 2035. However, some noise level increases would be a result of the proposed ramps under each build alternative. The maximum increase associated with the either build alternative would be 2 dBA L_{eq}, which is below the CEQA threshold of 3 to 5 dBA above the existing ambient level for a substantial increase. Thus, the build alternatives would not result in a substantial increase. Construction noise may be heard at nearby sensitive receivers and may cause occasional speech disruption, principally during times of pavement breaking or use of impact equipment. As described in Section 3.15.4.2, potential impacts during construction activities would be avoided by implementing construction noise abatement required by Caltrans' Standard Specification 14-8.02, "Noise Control". Thus, construction-related noise would not be considered adverse. Noise impacts would, therefore, be less than significant.

4.4.10 Biological Resources

4.4.10.1 Natural Communities

Within the BSA, a narrow 0.18 hectare (0.44 acre) strip of northern foredune vegetation occurs along the northwestern portion of the site. In addition there is an approximately 4.6-meter-wide (15-foot-wide) patch of invasive, non-native *Spartina alterniflora* hybrid on the northeastern portion of the site, north of the bridge. This species is more typical of northern coastal salt marsh but its invasive nature warrants mention here. The patch was treated with herbicide by the Invasive Spartina Project in September 2008 (Hogle 2008). Wave action in the BSA appears to be too strong to allow substantial northern coastal salt marsh vegetation to develop.

Within the BSA, an approximate 0.01 hectare (0.028 acre) patch of central coast riparian scrub occurs at the southern end of the northern foredune community where a culvert empties into the bay. A patch of vegetation referred to as riparian scrub was also noted in this area in the Transfer and Reuse of Naval Station Treasure Island FEIR (San Francisco Planning Department 2006). The sole species occurring in the BSA is arroyo willow (*Salix lasiolepis*). This species generally indicates the presence of freshwater. On-site, central coast riparian scrub conforms to the arroyo willow series as described in Sawyer and Keeler-Wolf (1995) and palustrine shrub-scrub wetland following Cowardin et al. (1979).

Permanent project features would entirely avoid the northern foredune and central coast riparian scrub vegetation on-site. Temporary staging and construction access would occur directly adjacent to its location. Potential impacts during construction activities would be avoided by placement of ESA exclusion fencing 3 meters (10 feet) from the perimeter of these communities. Contractor education would be conducted, bright-colored ESA fencing and signage shall be implemented, and a construction monitor shall confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. If necessary, fence repair and/or reinforcements shall be completed immediately. Impacts to natural communities would be less than significant.

4.4.10.2 Wetlands and Other Waters

No evidence of wetlands was found in the BSA. For both Alternatives 2b and 4, the potential Federal or state jurisdictional waters on-site consist solely of unvegetated waters flowing in concrete or roadside swales (Figure 3.17-2). Nearly all of these unvegetated waters demonstrate a direct connection to the Bay through culvert outlets on the shoreline. Due to the steep gradient, only the outer few feet of these waters, where they empty into the Bay, are below mean high tide (approximately 1.5 meters [5 feet] in elevation) and are tidally influenced. The mean high tide water level corresponds to Federally jurisdictional tidal waters of the Bay (Figure 3.17-2). The southeast edge of the BSA boundary runs at or slightly above the mean high tide line. On the northern edge of the BSA the boundary is well above the mean high tide line. As indicated in Table 4.4-1 Jurisdictional Waters below there is a total of 1,852 square feet (0.04 acre) of unvegetated waters within the BSA which may be regulated by the USACE and RWQCB under the CWA. BCDC jurisdiction includes waters of the Bay and extends 30.5 meters (100 feet) onto the shore from the mean high tide line encompassing any aquatic habitats as well as uplands. The downstream portions of unvegetated waters within 30.5 meters (100 feet) of the mean high tide line, which includes the segments under tidal influence, are under the jurisdiction of BCDC, along with the entire shoreline (Figure 3.17-2). Of the total 1,852 square feet (0.04 acres) of unvegetated waters within the BSA, 386 square feet (0.01 acres) may also be regulated by the BCDC as indicated in Table 4.4-2 BCDC Jurisdiction, approximately 191,228.4 square feet (4.39 total acres) (primarily uplands) falling under BCDC jurisdiction are located within the BSA. There would be no temporary or permanent impacts to tidal waters under either alternative. There would be no permanent impacts to Federal and state jurisdictional unvegetated waters under either project alternative. Approximately 0.01 acre (586 square feet) of non-jurisdictional unvegetated waters would be temporarily disturbed during project construction where they coincide with potential staging and access areas for both alternatives (Figures 3.17-3 and 3.17-4). Unvegetated waters that will be subject to temporary disturbance do not fall within 30.5 meters (100 feet) of the mean high tide line and are entirely outside the jurisdiction of the BCDC (Figures 3.17-3 and 3.17-4, and Table 3.17-1). These drainages are concrete-lined and convey storm water runoff; therefore, they have minimal value as aquatic habitat. These features would be restored to their current condition after construction staging is complete. Both project alternatives would be elevated above these features; therefore, post-construction impacts are not expected. The outer 30.5 meters (100 feet) of these drainages is under the jurisdiction of BCDC; however no temporary or permanent construction impacts are anticipated to these drainages within BCDC jurisdiction.

The remaining lands within 30.5 meters (100 feet) of the mean high tide that will be permanently or temporarily affected are considered uplands. Under Alternative 2b there will be no permanent impacts or temporary disturbance to lands falling under the purview of BCDC. Alternative 4 will involve permanent impacts to 0.25 acres and temporary disturbance to lands totaling 0.36 acres which fall under the purview of BCDC. Temporarily disturbed habitats will be restored to their natural condition after completion of the project.

Table 4-1: Jurisdictional Waters

Potential Jurisdictional Agency	Jurisdictional Feature	Total Within Study Area square feet (acres)	Not Impacted square feet (acres)	Temporary Impacts square feet (acres)	Permanent Impacts square feet (acres)
RWQCB (Waters of the State)	Unvegetated Waters	1,742.4 (0.04)	2b – 1,742.4 (0.04) 4- 1,742.4 (0.04)	2b –0 4 – 0	0
USACE (Waters of the US)	Unvegetated Waters	1,742.4 (0.04)	2b –1,742.4 (0.04) 4- 1,742.4 (0.04)	2b –0 4 – 0	0

Table 4-2: BCDC Jurisdiction

Jurisdictional Agency	Jurisdictional Area	Total Within Study Area	Not Impacted	Temporary Impacts[1]	Permanent Impacts[1]
BCDC	Within 100 feet of Mean High Tide	4.39 acres	2b-4.38 acres 4-4.03 acres	2b-0.0 acres 4-0.36 acres	2b-0 acres 4-0.25 acres

[1]Lands affected by project alterantives falling within BCDC jurisdiction are considered uplands.

Unvegetated waters on-site consist of concrete-lined drainages adjacent to roadways. Some of these features fall under the jurisdiction of USACE, CDFG, and RWQCB. Based on a preliminary review of photos and the jurisdictional determination map the USACE indicated via e-mail correspondence on January 4th, 2011, that several of the unvegetated waters features appear to have been constructed in uplands, drain only uplands, and are therefore not jurisdictional. USACE stated that the remaining features (Location ID's 1, 2, 4, 5, and 6), based on their position in the landscape (topography), would indicate that they are natural ephemeral drainages, although some of them have been armored with concrete or filled with debris over the years. Only 586 square feet (0.01 acre) of non-jurisdictional features will be disturbed by temporary construction activities. Therefore notifications or permits are not anticipated (e.g., 404 CWA permit from USACE and 401 Certification from RWQCB). These unvegetated non-jurisdictional features would be restored at a 1:1 ratio on-site post-construction; therefore, compensatory measures are not anticipated.

As described in Section 3.17.2.4, potential impacts to the tidal waters of the Bay would be avoided by temporary construction features and permanent project features. Tidal waters would not be affected by temporary construction activities due to implementation of standard construction BMPs to treat and minimize discharge of dredged or fill material into the Bay (Figures 3.17-3 and 3.17-4). Existing SFOBB project staging areas that are present within the BSA would be largely utilized for project-related construction staging and access. Standard construction BMPs, including placement of straw wattles or silt fencing along the boundary of the project area, would be implemented according to an erosion control plan, which would be prepared to avoid discharge into the waters of the Bay (and the related aquatic environment that provides habitat, nesting, feeding, and refuge for shorebirds) during staging and construction of the ramps. Catch basin inlet protection and installation of straw wattles (fiber rolls) would be implemented throughout the project site during construction to protect the aquatic environment from discharge that could include dredged or fill material. Other construction BMPs for limiting hydrological interruption of potential Federal or state jurisdictional waters that would be reviewed and coordinated with the RWQCB and BCDC for implementation during work near the Bay waters are included in the Water Quality discussion.

Implementation of standard construction BMPs and compliance with required laws and regulations would ensure that potential impacts associated with wetlands and other waters would be reduced to less-than-significant levels.

4.4.10.3 Plant Species

STINGING PHACELIA AND LARGE-FLOWERED SAND-SPURREY

Based upon initial field surveys and review of the above-listed documents the 10 species identified below have a low to moderate potential to occur on-site based on habitat availability and were included in focused botanical surveys conducted during spring and summer 2009 during the appropriate blooming periods (Figure 3.17-5). During focused botanical surveys, two of these species were observed in the BSA, stinging phacelia (*Phacelia malvifolia*) and large-flowered sand-spurrey (*Spergularia macrotheca* var. *macrotheca*). Survey methods and results are discussed in more detail in the botanical survey report (Natural Environment Study: YBI Ramps Improvement Project, 2011b, Appendix N). The remaining target species were not found during focused surveys and are therefore presumed absent from the site.

Both project alternatives could cause temporary and permanent impacts to areas with stinging phacelia (Figures 3.17-6 and 3.17-7). The total area of potential impact to stinging phacelia is provided below for each alternative:

- Alternative 2b
    - 11 square meters (113 square feet) permanent, 20 square meters (215 square feet) temporary
- Alternative 4
    - 20 square meters (215 square feet) permanent, 11 square meters (113 square feet) temporary

As described in Section 3.17.3.4, potential impacts during construction activities would be avoided by placement of exclusion fencing 3 meters (10 feet) from the perimeter of the stinging phacelia stands outside the temporary and permanent impact area. Contractor education would be conducted, bright-colored ESA fencing and signage would be implemented, and a construction monitor shall confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. However, the project alternatives could cause permanent impacts to areas with stinging phacelia during construction. As described in Section 2.2.4, stinging phacelia shall be replaced at a minimum 1:1 ratio as part of the woodland revegetation plan and further described in Section 4.7.1.1. Impacts to stinging phacelia would be minimized with replacement planting.

Large-flowered sand-spurrey was observed during botanical surveys on 7 square meters (79 square feet). The plants are located outside of the proposed temporary and permanent impact areas for both Alternative 2b and Alternative 4 (Figures 3.17-6 and 3.17-7).They are, however, located within 30.5 meters (100 feet) of the temporary disturbance areas and there is potential for incidental impacts during construction. As described in Section 3.17.3.4, large flowered sand-spurrey would be avoided to the extent feasible and protected during construction. Potential impacts during construction activities would be avoided by placement of exclusion fencing 3 meters (10 feet) from the perimeter of the large flowered sand-spurrey stand outside the temporary and permanent impact area. Contractor education would be conducted, bright-colored ESA fencing and signage shall be implemented, and a construction monitor shall confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements shall be completed immediately. Loss of individuals is not anticipated.

4.4.10.4 Animal Species

MONARCH BUTTERFLY AND SAN FRANCISCO LACEWING

Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest (Figures 3.17-3 and 3.17-4), which provide potential habitat for monarch butterfly and San Francisco lacewing. The total area of potential impact to this habitat is limited for each alternative:

- Alternative 2b
    - eucalyptus woodland = 0.10 hectare (0.25 acre) permanent, 0.36 hectare (0.90 acre) temporary
    - mixed broadlead conifer forest = 0.28 hectare (0.70 acre) permanent, 0.38 hectare (0.95 acre) temporary
- Alternative 4
    - eucalyptus woodland = 0.08 hectare (0.19 acre) permanent, 0.50 hectare (1.24 acres) temporary
    - mixed broadleaf conifer forest = 0.13 hectare (0.32 acre) permanent, 0.53 hectare (1.32 acres) temporary

As described in Section 3.17.4.4, prior to the onset of construction activities, a qualified biologist would conduct focused surveys for monarch butterfly to determine presence or absence within the proposed project areas. If monarch butterfly winter roost sites are determined to be present during focused surveys, occupied habitat would be avoided to the extent feasible, or it would only be disturbed outside of the winter roost season, which is typically from September through March. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new roost site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures before construction resumes in the area. Removal of eucalyptus woodland and mixed broadleaf conifer forest habitat that may provide habitat for monarch butterfly will be offset by implementation of the woodland habitat revegetation plan as described in Section 4.7.2.1. Trees removed will be replaced, providing potential habitat that may benefit the species longer term. Compensatory measures are not proposed.

As described in Section 3.17.4.4, prior to the onset of construction activities, a qualified biologist would conduct focused surveys for San Francisco lacewing to determine presence or absence within the proposed project areas. If any individuals are determined to be present during focused surveys, occupied habitat would be avoided to the extent feasible. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If the species is discovered during construction, the biological monitor would be contacted to implement avoidance procedures before construction resumes in the area. Removal of eucalyptus woodland and mixed broadleaf conifer forest habitat that may provide habitat for San Francisco lacewing will be offset by implementation of the woodland habitat revegetation plan as described in Section 4.7.2.1. Trees removed will be replaced, providing potential habitat that may benefit the species longer term. Compensatory measures are not proposed.

GUMMIFERA LEAF-CUTTER BEE

Both build alternatives would have potential temporary and permanent impacts to landscaped/disturbed areas (Figures 13.7-3 and 13.7-4), which may provide potential habitat for gummifera leaf-cutter bee, including rosebushes. The total area of potential impact to this habitat is limited for each alternative:

- Alternative 2b
    - landscaped/disturbed = 0.04 hectare (0.09 acre) permanent, 0.09 hectare (0.23 acre) temporary
- Alternative 4
    - landscaped/disturbed = 0.07 hectare (0.18 acre) permanent, 0.06 hectare (0.14 acre) temporary

As described in Section 3.17.4.4, prior to the onset of construction activities, a qualified biologist would conduct focused surveys for gummifera leaf-cutter bee to determine presence or absence within the proposed project areas. If any gummifera leaf-cutter bees are determined to be present during focused surveys, occupied habitat would be avoided to the extent feasible. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If the species is discovered during construction, the biological monitor would be contacted to implement avoidance procedures before construction resumes in the area. Removal of vegetation that may provide habitat for the gummifera leaf-cutter bee will be offset by implementation of the revegetation plan as described in Section 4.7.1.2. Vegetation removed, including non-native trees, will be replaced, providing potential habitat that may benefit the species longer term if it occurs in the area. Compensatory measures are not proposed.

RAPTORS (COOPER'S HAWK, GOLDEN EAGLE, WHITE-TAILED KIT, AND OTHER NESTING RAPTORS) AND NONRAPTORS (SHOREBIRDS, MARSHBIRDS, AND WATERBIRDS)

Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest. Project construction activities have the potential to disturb Cooper's hawks, golden eagles, white-tailed kites, and wading bird species that nest in mature woodlands, such as egrets and herons that attempt nesting within the project area and those that may be nesting adjacent to the site. The total area of potential impact to woodland and forest habitat is limited for each alternative:

- Alternative 2b
  - woodland and forest habitat = 0.38 hectare (0.95 acre) permanent, 0.75 hectare (1.85 acres) temporary
- Alternative 4
  - woodland and forest habitat = 0.21 hectare (0.51 acre) permanent, 1.04 hectares (2.56 acres) temporary

As described in Section 3.17.4.4, Cooper's hawks, golden eagle, white-tailed kite, and common raptor species such as red-tailed hawk have the potential to nest within habitats on-site. Any removal of trees, buildings, or other structures, or construction activities within the vicinity of active raptor nests could result in nest abandonment, nest failure, or premature fledging. Destruction or disturbance of active nests would be in violation of the MBTA and Fish and Game Code. Therefore, the following measures would be implemented to avoid project-related impacts to potentially nesting raptors in coordination with CDFG:

1. To the extent feasible, potential nest trees will be avoided.
2. To the extent feasible, the necessary removal of any trees or structures would occur from September 1 through December 15, outside the breeding season. If removal of trees or structures occurs, or construction begins between December 15 and August 31 (the nesting season), a nesting bird survey would be performed by a qualified biologist within 15 days prior to the removal of potential nesting trees or structures, or prior to disturbance of areas in the vicinity of potential nest sites.
3. All trees or structures with active nests would be flagged and a nondisturbance buffer zone established around the nest site in coordination with CDFG. Additionally, if any nests are found on the bridge or other structures within the project area or within 152.4 meters (500 feet) of the project area boundary, these nests shall be flagged and a nondisturbance buffer zone established. Buffer zones typically range between 61 and 152.4 meters (200 and 500 feet) depending on the species involved, site conditions, nesting stage, and type of work in proximity. Contractor education would be conducted for nesting bird avoidance. Observations would be conducted by a qualified biologist to confirm that work occurring outside of the buffer zone is not disturbing nesting pairs. If necessary, buffer zones would be adjusted to reduce distress to birds.
4. Active nests would be regularly monitored by a qualified biologist in coordination with CDFG to determine when the young have fledged and are feeding on their own. CDFG would be consulted for clearance before construction activities resume within the buffer zone. CDFG will be notified if any nest is disturbed.

5. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures, in coordination with CDFG, before construction resumes in the area.

Temporarily disturbed woodland and forested areas will be restored after completion of construction activities. Removal of eucalyptus woodland and mixed broadleaf conifer forest habitat that may provide nest sites for Cooper's hawks, golden eagles, and white-tailed kites will be offset by implementation of the woodland habitat revegetation plan as described in Section 4.7.1.2. Trees removed will be replaced with natives to the island. Compensatory measures are not proposed.

As described in Section 3.17.4.4, suitable nesting and foraging habitat is present on-site for several species of wading birds, including snowy egret, great blue heron, great egret, and black-crowned night-heron. Therefore, the following measures would be implemented to avoid project-related impacts to potentially nesting birds, in coordination with CDFG:

1. The removal of any structures, trees, or shrubs would occur from September 1 through February 1, outside the breeding season. If removal of trees or shrubs occurs, or construction begins between February 1 and August 31 (the nesting season), a nesting bird survey would be performed by a qualified biologist within 15 days prior to the removal of potential nesting structures, trees, or shrubs, or prior to disturbance of areas in the vicinity of potential nest sites, i.e., trees and shrubs.

2. All active nests would be flagged and a nondisturbance buffer zone established around the nesting tree in coordination with the CDFG. Buffer zones for wading birds typically range between 30.5 and 61 meters (100 and 200 feet) depending on the species involved, site conditions, and type of work proposed in the vicinity. Contractor education would be conducted for nesting birds, including a discussion of avoidance and protection measures.

3. Active nests would be monitored by a qualified biologist in coordination with CDFG to determine when the young have fledged and are feeding on their own. The project biologist would be consulted for clearance before construction activities resume in the vicinity.

4. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new nest or roost site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area.

Temporarily disturbed woodland and forested areas will be restored after completion of construction activities. Removal of eucalyptus woodland and mixed broadleaf conifer forest habitat that may provide nest sites for wading birds will be offset by implementation of the woodland habitat revegetation plan as described in Section 4.7.1.2. Trees removed will be replaced, with natives to the island. Compensatory measures are not proposed.

PASSERINE AND NONPASSERINE LANDBIRDS

Both build alternatives would have potential temporary and permanent impacts to potential landbird nesting habitat, including central coast riparian scrub, eucalyptus woodland, landscaped/disturbed, mixed broadleaf conifer forest, non-native scrub/shrubland, northern foredune, and ruderal/disturbed habitat:

- Alternative 2b
    - central coast riparian scrub, eucalyptus woodland, landscaped/disturbed, mixed broadleaf conifer forest, non-native scrub/shrubland, and ruderal/disturbed = 0.43 hectare (1.07 acres) permanent, 1.17 hectares (2.88 acres) temporary
- Alternative 4
    - central coast riparian scrub, eucalyptus woodland, landscaped/disturbed, mixed broadleaf conifer forest, non-native scrub/shrubland, and ruderal/disturbed = 0.36 hectare (0.89 acre) permanent, 1.32 hectares (3.27 acres) temporary

As described under Avoidance, Minimization, and Mitigation Measures in Section 3.17.4.4, several special-status and common passerine and nonpasserine landbirds, listed above, have at least some potential to nest and forage on-site. Any removal of structures, trees, or shrubs, or construction activities in the vicinity of active nests could result in nest abandonment, nest failure, or premature fledging. Destruction or disturbance of active nests would be in violation of the MBTA and Fish and Game Code. Therefore, the following measures would be implemented to avoid project-related impacts to potentially nesting passerine and nonpasserine landbirds, in coordination with CDFG:

1. The removal of any structures, trees, or shrubs would occur from September 1 through February 1, outside the passerine and nonpasserine landbird breeding season. If removal of trees or shrubs occurs, or construction begins between February 1 and August 31 (the nesting season), a nesting bird survey would be performed by a qualified biologist within 15 days prior to the removal of potential nesting structures, trees, or shrubs, or prior to disturbance of areas in the vicinity of potential nest sites, i.e., trees and shrubs.

2. All active nests would be flagged and a nondisturbance buffer zone established around the nesting tree (or other nesting substrate) in coordination with the CDFG. Buffer zones for passerines and nonpasserine land birds typically range between 15.2 to 27.4 meters (50 and 90 feet), depending on the species involved, site conditions, and type of work proposed in the vicinity. Contractor

education would be conducted for nesting birds, including a discussion of avoidance and protection measures.

3. Active nests would be monitored by a qualified biologist in coordination with CDFG to determine when the young have fledged and are feeding on their own. The project biologist would be consulted for clearance before construction activities resume in the vicinity.

4. If a new nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures, in coordination with CDFG, before construction resumes in the area.

Impacts to potential landbird nesting habitat is not anticipated.

DOUBLE-CRESTED CORMORANT

Additionally, construction activities along the eastern border of the BSA could potentially temporarily disturb roosting cormorants, if construction activities move outside of the construction envelope. As described in Section 3.17.4.4, Double-crested cormorants have potential to nest and forage on-site. Construction activities on or adjacent to the existing bridge structure or the eastern border of the BSA could potentially disturb cormorants. Therefore, the following measures are recommended to avoid project-related impacts to double-crested cormorants, in coordination with CDFG:

1. Throughout project construction, monitoring of the potential cormorant nest sites on the existing SFOBB would be continued following the methodology outlined in the Final Revised Bird Monitoring and Management Plan (LSA 2003).

2. If construction activities begin between February 1 and August 31 (the nesting season), a nesting bird survey of the on-site bridge structure would be performed by a qualified biologist within 15 days prior to onset of construction to ensure that no cormorants have begun to nest in the structure or within 61 meters (200 feet) of the project disturbance footprint.

3. All active nests would be flagged or mapped and a nondisturbance buffer zone established around the nest in coordination with the CDFG. Buffer zones typically range between 30.5 and 61 meters (100 to 200 feet) for wading and waterbirds depending on the species involved, site conditions, and type of work proposed.

4. Active nests would be monitored by a qualified biologist in coordination with CDFG to determine when the young have fledged and are feeding on their own. CDFG would be consulted for clearance before construction activities resume.

5. Exclusion fencing would be placed around the construction footprint to prevent construction equipment for entering areas where the cormorants may roost. A construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately.

6. If a new roost or nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area.

Impacts to Double-crested cormorants are not anticipated.

AMERICAN PEREGRINE FALCON

Project construction activities have the potential to disturb peregrine falcons that attempt nesting within the project area and those that may be nesting adjacent to the site. Construction-related noise and vibration could potentially impact the success of nests that are within line of sight or near enough to disturb the normal activities of the adult birds.

As described in Section 3.17.4.4, peregrine falcons have the potential to nest in proximity to the BSA and have a high potential to use the BSA for foraging. Construction activities within the vicinity of active raptor nests could result in nest abandonment, nest failure, or premature fledging. Destruction or disturbance of active nests would be in violation of the MBTA and Fish and Game Code. In addition, peregrines are protected under the CESA. Therefore, the following measures would be implemented to avoid project-related impacts to potentially nesting peregrine falcons:

1. Throughout project construction, monitoring of the potential peregrine falcon nest sites on the columns of the existing SFOBB would be continued following the methodology outlined in the Final Revised Bird Monitoring and Management Plan (LSA 2003).

2. If removal of structures occurs, or construction begins between December 15 and August 31 (the nesting season), a nesting bird survey would be performed by a qualified biologist within 15 days prior to the removal of potential nesting structures, or prior to disturbance of areas in the vicinity of potential nest sites.

3. If an active peregrine falcon nest is discovered on the bridge or other structures within the project area or within 457.2 meters (1,500 feet) of the project area boundary, a nondisturbance buffer zone would be established in coordination with CDFG as necessary. Contractor education would be conducted by a qualified biologist for nesting bird avoidance. Observations would be conducted by a qualified biologist to confirm that work occurring outside of the buffer zone is not disturbing the nesting pair. If necessary, buffer zones would be adjusted to reduce distress to birds.

4. The CDFG would be consulted for clearance before construction activities resume within the buffer zone.

5. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area.

Impacts to peregrine falcons are not anticipated.

CALIFORNIA BROWN PELICAN

California brown pelican has the potential to occur within the BSA and roost on piers and the sandy shoreline just outside the temporary and permanent project construction areas. Temporary disturbance to roosting pelicans could occur if construction activities encroach upon occupied roosting habitat. As described in Section 3.17.4.4, the following measures would be implemented to avoid project-related impacts to California brown pelican:

Exclusion fencing would be placed around the construction footprint to prevent construction equipment from entering areas where the pelicans may roost. Contractor education would be conducted, including a discussion of avoidance and protection measures. A construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new roost site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area. Compensatory measures are not proposed due to the lack of permanent impacts.

No permanent impacts to potential roosting areas are anticipated as the project construction footprint would avoid the piers in the Bay and the shoreline including the northern foredune community. Therefore impacts to the California brown pelican are not anticipated.

TERRESTRIAL MAMMALS

San Francisco Dusky Footed Woodrat

Project construction activities have the potential to directly affect woodrats if they occur within the project area and indirectly disturb those that may be utilizing woodlands and/or forests adjacent to the site. Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest that provide potential habitat. Removal of vegetation would result in a loss of potential foraging and nesting habitat:

- Alternative 2b
  - woodland and forest habitat = 0.38 hectare (0.95 acre) permanent, 0.75 hectare (1.85 acres) temporary
- Alternative 4
  - woodland and forest habitat = 0.21 hectare (0.51 acre) permanent, 1.04 hectares (2.56 acres) temporary

As described in Section 3.17.4.4, a preconstruction survey for San Francisco dusky-footed woodrat and associated woodrat houses would be performed by a qualified biologist within 30 days prior to any removal of trees or other vegetation on the site and within 30.5 meters (100 feet) of planned construction activities. If no active houses are found, then no further action would be proposed. If active woodrat houses are found in or below trees and vegetation that would be removed or temporarily disturbed as part of project construction, the project would be redesigned to avoid the loss of the occupied habitat and disturbance to woodrats to the extent feasible. If the project cannot be redesigned to avoid removal of the occupied habitat, the woodrat house may be relocated to a suitable location as close to the original house as possible while maintaining an adequate buffer of construction activities in coordination with CDFG. Animal exclusion fencing would be placed around the construction area, to prevent woodrat ingress, and contractor education would be conducted. A construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new nest site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures in coordination with CDFG before construction resumes in the area.

If San Francisco dusky-footed woodrat houses are found within portions of the project that require permanent or temporary disturbance or if occupied habitat is accidentally damaged during construction, habitat shall be replaced at a 1:1 ratio and further described in Section 4.7.1.2. Impacts to San Francisco dusky-footed woodrat would be minimized with replacement planting.

Special-Status Bats

Project construction activities have the potential to directly affect bats roosting within the project area and indirectly disturb those that may be roosting adjacent to the site. Both build alternatives would have potential temporary and permanent impacts to eucalyptus woodland and mixed broadleaf conifer forest that provide potential roost sites. Removal of trees would result in a loss of potential bat roosting habitat:

- Alternative 2b
    - woodland and forest habitat = 0.38 hectares (0.95 acres) permanent, 0.75 hectare (1.85 acres) temporary. Alternative 2b would require removal of one unoccupied building that provides potential roost habitat. In addition, the bridge structure and portions of the road way would be disturbed and modified during construction which may result in a loss of potential roost sites.
- Alternative 4
    - woodland and forest habitat = 0.21 hectare (0.51 acre) permanent, 1.04 hectares (2.56 acres) temporary. No buildings are proposed for removal under Alternative

As described in Section 3.17.4.4, a preconstruction survey for roosting bats would be performed by a qualified biologist within 30 days prior to any removal of trees or structures on the site. If no active roosts are found, then no further action would be proposed. If either a maternity roost or hibernacula (structures used by bats for hibernation) is present, the following minimization measures would be implemented:

1. If active maternity roosts or hibernacula are found in trees or structures that would be removed or disturbed as part of project construction, the roost would be avoided by construction activities to the extent feasible. If an active maternity roost is located and avoidance of the occupied tree or structure is not feasible, demolition can commence before maternity colonies form (i.e., prior to March 1)

or after young are volant (flying) (i.e., after July 31). Disturbance-free buffer zones as determined by a qualified biologist in coordination with CDFG would be observed during the maternity roost season (March 1 through July 31).

2. ESA exclusion fencing would be placed around avoided habitats and contractor education would be conducted to prevent encroachment of construction activities. Bright-colored ESA fencing and signage would be implemented and a construction monitor would confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements would be completed immediately. If a new roost site is discovered during construction, the biological monitor would be contacted to implement avoidance procedures before construction resumes in the area.

3. If a nonbreeding bat hibernacula is found in a tree or structure scheduled for removal, the individuals would be safely evicted, under the direction of a qualified biologist (as determined by possession of a Memorandum of Understanding (MOU) with CDFG typically amended to the individual's scientific collecting permit), by opening the roosting area to allow airflow through the cavity. Demolition can then follow at least one night after initial disturbance for airflow. This action should allow bats to leave during darkness, thus increasing their chance of finding new roosts with a minimum of potential predation during daylight. Trees or structures with roosts that need to be removed would first be disturbed at dusk, just prior to removal that same evening, to allow bats to escape during the darker hours.

If special-status bats are found roosting within trees or structures on-site that require removal or if occupied habitat is accidentally damaged during construction, habitat shall be replaced at a 1:1 ratio and further described in Section 4.7.1.2. Impacts to special-status bats would be minimized with replacement planting.

4.4.10.5 Threatened and Endangered

Beach layia, California sea-blite, robust spineflower, and San Francisco lessingia were not observed in the project area during focused botanical surveys and are presumed absent; therefore, impacts are not anticipated.

Bald eagles do not have the potential to occur in the project area due to lack of appropriate habitat and are presumed absent; therefore, impacts are not anticipated.

The hillside that provides potential nesting habitat for bank swallow would be avoided. As described in Section 3.17.5.4, any removal of structures, trees, or shrubs, or construction activities in the vicinity of active nests could result in nest abandonment, nest failure, or premature fledging. Destruction or disturbance of active nests would be in violation of the MBTA and Fish and Game Code. Therefore, the following measures would be implemented to avoid project-related impacts to potentially nesting bank swallows in proximity to construction areas in coordination with CDFG:

1. The removal of any structures, trees, or shrubs would occur from September 1 through February 1, outside the passerine and nonpasserine landbird breeding season. If removal of trees or shrubs occurs, or construction begins between February 1 and August 31 (the nesting season), a nesting bird survey would be performed by a qualified biologist within 15 days prior to the removal of potential

nesting structures, trees, or shrubs, or prior to disturbance of areas in the vicinity of potential nest sites, i.e., hillsides and trees.

2. All active nests would be flagged and a nondisturbance buffer zone established around the nesting tree (or other nesting substrate) in coordination with the CDFG. Buffer zones for passerines and nonpasserine land birds typically range between 15.2 to 27.4 meters (50 and 90 feet), depending on the species involved, site conditions, and type of work proposed in the vicinity. Contractor education would be conducted for nesting birds, including a discussion of avoidance and protection measures.

3. Active nests would be monitored by a qualified biologist in coordination with CDFG to determine when the young have fledged and are feeding on their own. The project biologist would be consulted for clearance before construction activities resume in the vicinity.

Permanent impacts to bank swallow are not anticipated and would be less than significant.

4.4.10.6 Invasive Species

YBI’s location in the Central San Francisco Bay, even aside from new construction and development, provides a hospitable habitat for invasive species due to its location at the crossroads of a busy marine port and interstate freeway thoroughfare. As a direct result of project grading, land disturbance, and debris generated from construction for either build alternative, YBI would be subject to the potential increased spread of invasive plant and wildlife species. Invasive plant species can be spread through construction equipment tire treads, construction materials, land clearing, people, and wildlife. Invasive/nuisance wildlife would be attracted to garbage created by construction staff and traffic. Land clearing and vegetation removal provides the ideal habitat for invasive plant and animal species colonization due to their success as generalists in landscapes that lack specified ecological niches. Through this process, invasive species can increase the ecological homogenization of YBI.

To avoid the environmental consequences outlined above and in Chapter 3, there would be a multilayered approach to avoid, minimize, and/or mitigate the project’s effects. In compliance with EO 13112 and subsequent guidance from FHWA, the landscaping and erosion control measures included in the project would not use species listed as noxious or invasive weeds by the California Department of Food and Agriculture (CDFA 2010). In areas of particular sensitivity, extra precautions would be taken if invasive species are found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

For botanical resources, hydroseeding and replanting for erosion control and revegetation of slopes would be verified for being invasive plant/weed-free before application by an established, approved, licensed, and insured contractor. Local native plant ecotypes would be used for replanting in affected areas. To minimize attracting non-native/nuisance wildlife, garbage generated on-site would be appropriately disposed of in garbage cans placed throughout the site and deposited into large and secure dumpsters daily. These dumpsters would be emptied on a weekly basis before dusk. On-site toilets would be maintained daily for site sanitation and to avoid attracting more nuisance wildlife. Worker education would focus on the diminishment and disposal of on-site garbage and the factors associated with decreasing invasive species potential on-site.

By encouraging proper and timely sanitation of construction-generated waste (especially food), invasive rodent (e.g., mice and rat) activity would be controlled. In most urbanized environments random food scraps and overgrown or salvage areas provide abundant forage and habitat for rodents. Neat, off-the-ground storage of pipes, girders, cable, wire, and lumber would help reduce the suitability of the area for rats and would also make rodent detection easier. Garbage and trash, and all garbage receptacles would have tight-fitting covers. Feral pets should not be encouraged through provision of food for feeding. This food may become a ready supply of food for rats and mice, or other nuisance wildlife.

Overall, the introduction and spread of exotic and invasive plant and wildlife species would be avoided to the maximum extent possible. BMPs, as identified by the SFRWQCB and described in Section 3.17.2.4, would be implemented to control erosion while not increasing the spread of invasive plant or wildlife species. In some cases, hydroseeding or rapid replanting measures can increase the spread of weed/invasive grass species through lack of seed purity or insufficient preparation of the seed mix. Revegetation contractors would implement standard QA/QC measures to verify the purity of native seed mix and the site appropriateness of ecotypes for revegetation utilizing container plants. Invasive species impacts would be less than significant through compliance with EO 13122 and the avoidance and minimization measures above.

4.5 Unavoidable Significant Environmental Effects of the Proposed Project under CEQA

The proposed project would have unavoidable significant effects on cultural and visual resources. These resource areas are also discussed in Section 3.7, Visual/Aesthetics and Section 3.8, Cultural Resources.

4.5.1 Cultural Resources

For the purposes of CEQA, significant cultural resources are those resources that are eligible for or are listed in the CRHR. All resources determined eligible for or are listed in the NRHP are automatically eligible for the CRHR and, as such, are historical resources for the purposes of CEQA. In addition, cultural resources included in local registers of historical resources, as defined in Public Resource Code (PRC) 5020.1(k) or 5024.1(g), are also historical resources for the purposes of CEQA. CEQA states that “a project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment.”

The significance of a historical resource is materially impaired when a project demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that conveys its historical significance and justifies its inclusion in, or eligibility for the CRHR. Essentially, this means that if a project demolishes an entire historical resource, or alters it adversely so that it would no longer be eligible for the CRHR or be considered a historical resource, the project would have a substantial adverse change to that resource. However, after project construction, if the resource would still possess historical significance such that it would still be eligible, there would be no substantial adverse change.

The following analyzes the impacts of the YBI Ramps Improvement Project on six properties considered as historical resources for the purposes of CEQA. These are Quarters 8; Quarters 10/Building 267; the Senior Officers' Quarters Historic District; Quarters 1/Nimitz House; a portion of the East Span of the SFOBB; and a prehistoric archaeological site CA-SFR-04/H.

Neither Alternative 2b nor Alternative 4 would result in substantial adverse change to Quarters 8, or the archaeological site CA-SFR-04/H. Quarters 8 is located a sufficient distance from the proposed project work that no impacts would result to the building. Archaeological site CA-SFR-04/H would not experience substantial adverse change, because this area is currently designated as ESAs and would be protected during construction.

The YBI Ramps Improvement Project alternatives would not cause a direct impact on the SFOBB because that structure would be replaced through the separate replacement project. The SFOBB ESSSP would precede the proposed YBI Ramps Improvement Project that is subject of this analysis.

- Alternative 2b would impact the Quarters 10/Building 267 through the relocation of both buildings to avoid demolition.

- Alternative 2b would impact the Senior Officers' Quarters Historic District through the alteration, removal, and/or damage to a portion of the district's historic landscape, including grass and border hedge of the greensward in front of Quarters 1–3, and paved driveway and curbing southeast of Quarters 1/Nimitz House. A proposed support column would be constructed within the formal terraced garden behind Quarters 1/Nimitz House and would destroy much of the third level of the terrace garden, which is a contributing element of the historic district. In addition, there would be impacts to the cultural landscape of the Senior Officers' Quarters Historic District due to the addition of new nonhistoric features into the cultural landscape.

- Alternative 4 would also cause an impact on the historic district by the introduction of visual elements that diminish the integrity of the property's significant historic features. The size and scale of the proposed ramps structure are not consistent with historic setting or feeling of Quarters 1/Nimitz House or the historic district, and would introduce a new visual element. The ramp deck and support columns would obstruct the eastward view from Quarters 1/Nimitz House and, because the view from this building is a character-defining feature, Alternative 4 would diminish the integrity of Quarters 1/Nimitz House. Thus, the introduction of the ramp structures would thus cause an impact on both the district and Quarters 1/Nimitz House.

- Alternative 2b would impact Quarters 10/Building 267 through the relocation of both buildings to avoid demolition. However, a moved building, structure, or object that is otherwise eligible may be listed in the CRHR if it was moved to prevent its demolition at its former location and if the new location is compatible with the original character and use of the historic resource. A historic resource should retain its historic features and compatibility in orientation, setting, and general environment (California Office of Historic Preservation 2006:3). The proposed relocation of Quarters 10/Building 267 under the terms of the MOA meets these criteria and thus the buildings would retain sufficient integrity to convey their historical significance and would remain eligible for the CRHR and be considered a historical resource under CEQA [Statement pending finalization of the MOA].

- Alternative 2b would impact the Senior Officers' Quarters Historic District through the alteration, removal, and/or damage to a portion of the district's historic landscape, including grass and border hedge of the greensward in front of Quarters 1–3, and paved driveway and curbing southeast of Quarters 1/Nimitz House. Another proposed support column would be constructed within the formal terraced garden behind Quarters 1/Nimitz House and would destroy much of the third level of the terrace garden, which is a contributing element of the historic district. In addition, there would be impacts to the cultural landscape of the Senior Officers' Quarters Historic District due to the addition of new nonhistoric features into the cultural landscape. These impacts would not result in a substantial adverse change in the Senior Officers' Quarters Historic District because the district would still retain sufficient integrity to convey its historical significance and would remain eligible for the CRHR and be considered a historical resource under CEQA.

- Alternative 4 would also cause an impact on the historic district by the introduction of visual elements that diminish the integrity of the property's significant historic features. The size and scale of the proposed ramps structure are not consistent with historic setting or feeling of Quarters 1/Nimitz House or the historic district, and would constitute introduction of a new visual element. These impacts would not result in a substantial adverse change in the Senior Officers' Quarters Historic District because it would still retain sufficient integrity to convey its historical significance and would remain eligible for the CRHR and be considered a historical resource under CEQA.

The proximity of work conducted for both alternatives to historic resources presents the possibility that the resulting vibration could impact the buildings or character-defining features of the historic district and Quarters 1/Nimitz House (Alternatives 2b and 4). Caltrans monitors the effects of construction vibration on historic buildings and adjusts construction methods to prevent adverse effects. However, because vibration impacts may cause irreparable damage (and subsequent destruction) to these masonry foundation buildings, this would be considered a substantial adverse change wherein the resources would no longer retain sufficient integrity to meet the criteria for the CRHR and therefore would cease to be a historical resource under CEQA. A final determination of the sensitivity of these resources to vibration impacts would be determined through the mitigation (particularly vibration studies) stipulated in the MOA, and further described in Section 4.7.2. Impacts to cultural resources would remain significant and unavoidable even with implementation of mitigation.

4.5.2 Visual

As discussed in Section 3.7, Visual/Aesthetics, Table 4-1 provides the extent of the visual impacts associated with Alternative 2b and Alternative 4 for each viewpoint. Review of the table indicates that Alternative 2b would have a less adverse visual impact on the project area than Alternative 4.

Table 4-3: Summary of Project's Overall Visual Quality Impacts

	Alternative 2b	Alternative 4
Key Viewpoint 1	Minimally Adverse	Minimally Adverse
Key Viewpoint 2	Minimally Adverse	Adverse
Key Viewpoint 3	Strongly Adverse	Minimally Adverse
Key Viewpoint 4	Adverse	Adverse
Key Viewpoint 5	Negligible	Adverse
Key Viewpoint 6	Minimally Adverse	Minimally Adverse
Key Viewpoint 7	Negligible	Negligible
Key Viewpoint 8	Negligible	Negligible

Alternative 2b design would in some cases have significant impacts on the visual quality of some areas when these areas are observed from certain viewpoints. This would be more noticeable where views toward or from the Senior Officers' Quarters Historic District would be dominated and/or obstructed by the ramp structures. Alternative 4 would require less vegetation removal than Alternative 2b. However, the sheer mass and extent of the design would produce an overall more visually dominant effect relative to Alternative 2b. If Alternative 4 is implemented, the design would integrate landscaping to reduce the visual impact on the environment after ramp construction. . However, given the large scale of the ramps, it would be difficult to screen or sufficiently offset their visual effects without in the process causing secondary significant visual effects.

The project site is not located within a State-designated scenic corridor. Implementation of either build alternative would potentially affect the visual quality of the project site and its vicinity, including neighboring historic structures. Please refer to Section 3.8, Cultural Resources, of this Draft EIR/EIS for further discussion related to the project's potential impacts on these resources.

Impacts to visual resources would remain significant and unavoidable even with implementation of mitigation, described in Section 4.7.3.

4.6 Climate Change

Neither the Federal EPA nor FHWA has promulgated explicit guidance or methodology to conduct project-level GHG analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up-front in the planning process would facilitate decision-making and improve efficiency at the program level, and would inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders regarding climate change compared to the national level, the issue is addressed in the CEQA chapter of this environmental document and may be used to inform the NEPA decision. The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the state has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours travelled.

4.6.1 Regulatory Setting

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHG related to human activity that include carbon dioxide (CO2), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with greenhouse gas emissions and climate change at the state level. Assembly Bill 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year; however, in order to enact the standards California needed a waiver from the U.S. Environmental Protection Agency (EPA). The waiver was denied by Environmental Protection Agency in December 2007 and efforts to overturn the decision had been unsuccessful. See California v. Environmental Protection Agency, 9th Cir. Jul. 25, 2008, No. 08-70011. However, on January 26, 2009, it was announced that EPA would reconsider their decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5 mpg fuel economy standard for automobiles and light duty trucks which will take effect in 2012. On June 30, 2009 EPA granted California the waiver. California is expected to enforce its standards for 2009 to 2011 and then look to the Federal government to implement equivalent standards for 2012 to 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The state is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and GHG reduction is also a concern at the Federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the U.S. Environmental Protection Agency (EPA) to regulate GHG as a pollutant under the Clean Air Act (Massachusetts vs. Environmental Protection Agency et al., 549 U.S. 497 (2007).

The court ruled that GHG does fit within the Clean Air Act's definition of a pollutant, and that the EPA does have the authority to regulate GHG. Despite the Supreme Court ruling, there are no promulgated Federal regulations to date limiting GHG emissions.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

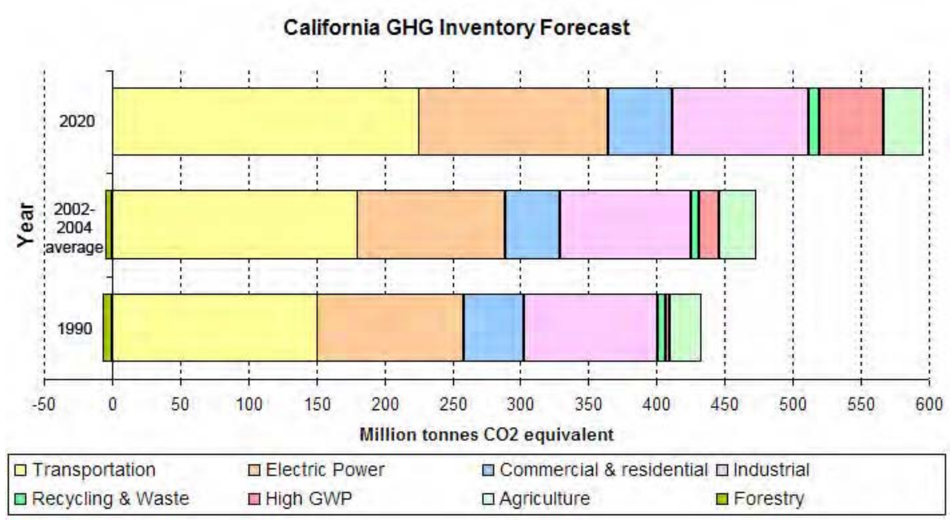
- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)--in the atmosphere threaten the public health and welfare of current and future generations.

- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009.

According to Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents (March 5, 2007), an individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of GHG. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(i)(1) and 15130. To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, CARB recently released an updated version of the GHG inventory for California (June 26, 2008). Figure 4-1 is a graph from that update that shows the total GHG emissions for California for 1990, 2002-2004 average, and 2020 projected if no action is taken.



Source: http://www.arb.ca.gov/cc/inventory/data/forecast.htm

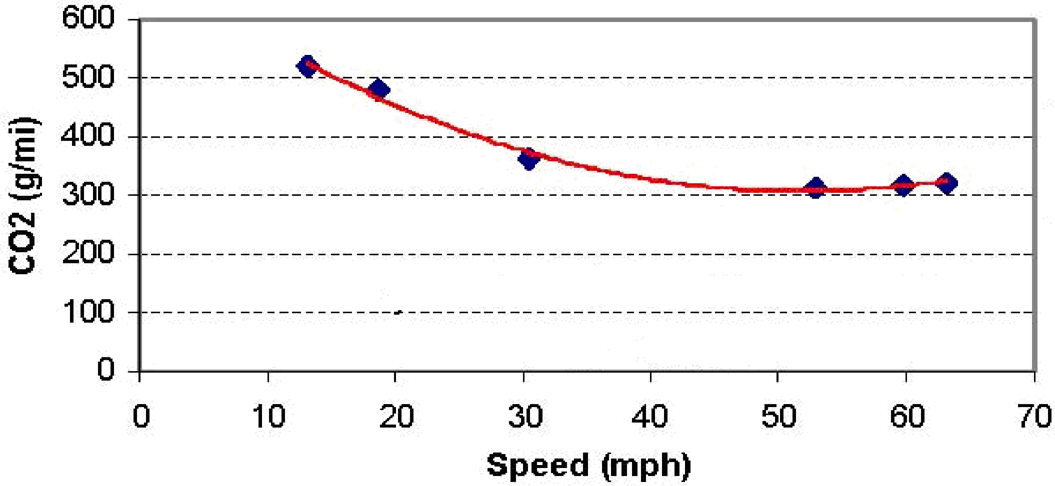
Figure 4-1
California Greenhouse Gas Inventory

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation (see Climate Action Program at Caltrans (December 2006), Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006. This document can be found at: http://www.dot.ca.gov/docs/ClimateReport.pdf.

4.6.2 Project Analysis

One of the main strategies in Caltrans' Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds of 0 to 40 kilometers per hour (km/h) [0 to 24 mph] and speeds more than 88 km/h (55 mph) (Figure 4-2). To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors

GHG emissions, particularly CO_2, may be reduced.



Source: Center for Clean Air Policy: http://www.ccap.org/Presentations/Winkelman %20TRB%202004%20(1-13-04).pdf

Figure 4-2
Fleet CO_2 Emissions vs. Speed (Highway)

The YBI Ramps Improvement Project is not a capacity increasing project. However, pursuant to the Climate Action Program, the proposed ramps would reduce traffic congestion along the San Francisco-Oakland Bay Bridge (SFOBB) by metering vehicles entering the SFOBB. The proposed metering system would allow a one-to-one ratio of vehicles exiting and entering the SFOBB and therefore would avoid a large volume of vehicles from entering the SFOBB at the YBI westbound on-ramp.

CONSTRUCTION EMISSIONS

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by on-site construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

It is Caltrans' goal to construct this proposed project in the least amount of time by planning and staging the work efficiently. The reduced construction time would lead to a low number of construction-related delays and make the benefits of the project available sooner. The YBI Ramps Improvement Project would include ramp metering, the metering rates can be coordinated such that the number of vehicles entering the mainly would be based on the number of vehicles exiting the mainline. Additionally, the mainline metering lights for westbound traffic (just west of the toll booths) could be coordinated with the on-ramp, such that the traffic entering the SFOBB could be reduced while the metering rate for the on-ramp is increased, and vice versa. The project would therefore have a traffic smoothing effect. This would reduce wear on the vehicles, and reduce fuel consumption and GHG emissions. Additional construction savings would result from fewer vehicle stops and starts, which is a wasteful condition in terms of fuel.

The construction contractor would be required to comply with Caltrans' Standard Specifications Section 14-9.01, "Air Pollution Control", and Section 14-9.02, "Dust Control," which would reduce construction-related emissions. Please also refer to the *Yerba Buena Island Ramps Improvement Project Air Quality Analysis* (Appendix L) for additional pollution abatement measures.

CEQA CONCLUSION

While there would be a slight increase in GHG emissions during construction, it is anticipated that any increase in GHG emissions due to construction would be offset by the improvement in operational GHG emissions. In the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct impact and its contribution on the cumulative scale to climate change, Caltrans is firmly committed to implementing measures to help reduce GHG emissions; which are outlined in the following section.

AB 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as CARB works to implement the Governor's executive orders and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a $238.6 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including $100.7 billion in transportation funding through 2016.[31] As shown in Figure 4-3 below, the Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in GHG emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

[31] Governor's Strategic Growth Plan, Fig. 1 (http://gov.ca.gov/pdf/gov/CSGP.pdf)

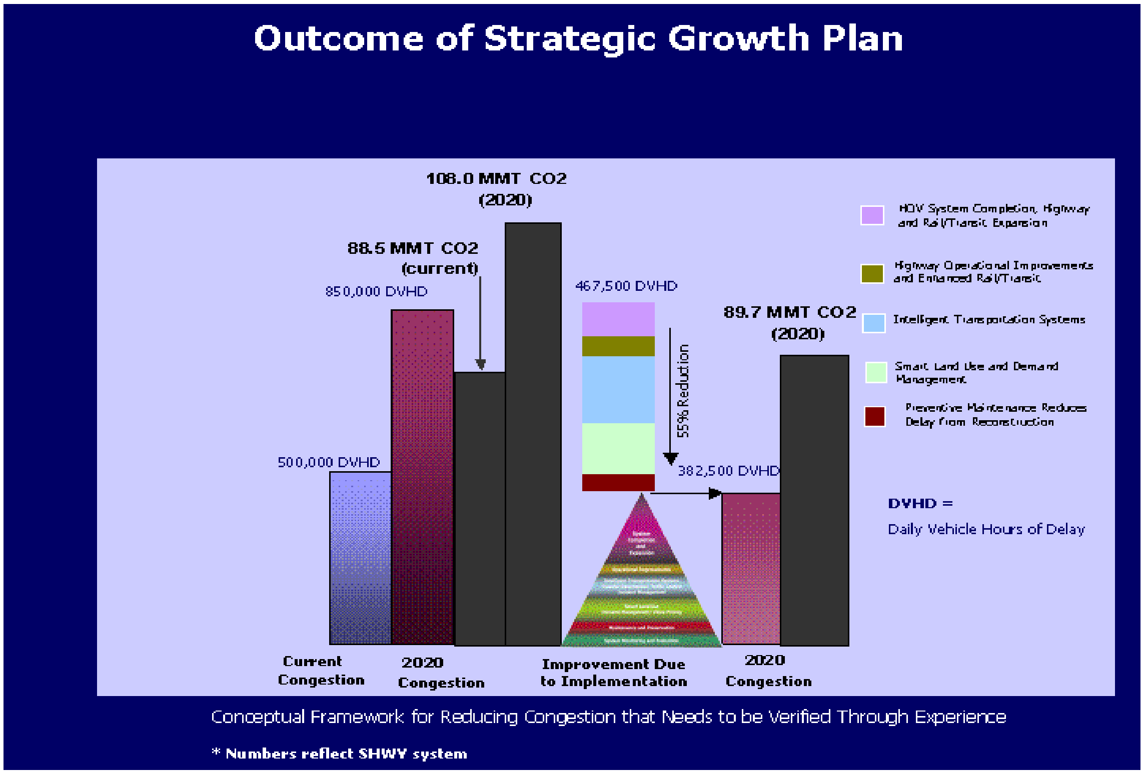


Figure 4-3
Outcome of Strategic Growth Plan

As part of the Climate Action Program at Caltrans (December 2006, http://www.dot.ca.gov/docs/ClimateReport.pdf), Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting ongoing research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by USEPA and CARB. Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the UC Davis.

Table 4-2 summarizes Caltrans and statewide efforts that Caltrans is implementing to reduce GHG emissions. For more detailed information about each strategy, please see Climate Action Program at Caltrans (December 2006, http://www.dot.ca.gov/docs/ClimateReport.pdf).

Table 4-4: Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, Cal/EPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Nonvehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 0.36	3.6
Goods Movement	Office of Goods Movement	Cal/EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

To the extent that it is applicable or feasible for the project and through coordination with the project development team, the following will also be included in the project to reduce the GHG emissions and potential climate change impacts from the project:

- Caltrans and the CHP are working with regional agencies to implement Intelligent Transportation Systems (ITS) to help manage the efficiency of the existing highway system. ITS are commonly referred to as electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.

- The project would incorporate the use of energy efficient lighting, such as LED bulbs for the proposed metering signals. LED bulbs—or balls, in the stoplight vernacular—cost $60 to $70 apiece but last 5 to 6 years, compared to the 1-year average lifespan of the incandescent bulbs previously used. The LED balls themselves consume 10 percent of the electricity of traditional lights, which will also help reduce the project's CO_2 emissions.[32]

Adaptation Strategies

"Adaptation strategies" refer to how Caltrans and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damaging roadbeds by longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

Climate change adaption must also involve the natural environment as well. Efforts are underway on a statewide level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, Governor Schwarzenegger signed EO S-13-08, which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change.

The California Resources Agency (now the Natural Resources Agency [Resources Agency]), through the interagency Climate Action Team, was directed to coordinate with local, regional, state and Federal public and private entities to develop a state Climate Adaptation Strategy. The Climate Adaptation Strategy will summarize the best known science on climate change impacts to California, assess California's vulnerability to the identified impacts, and then outline solutions that can be implemented within and across state agencies to promote resiliency.

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[32] Knoxville Business Journal, "LED Lights Pay for Themselves," May 19, 2008 at http://www.knoxnews.com/ news/2008/may/19/ed-traffic-lights-pay-themselves/.

As part of its development of the Climate Adaptation Strategy, Resources Agency was directed to request the National Academy of Science to prepare a *Sea Level Rise Assessment Report* by December 2010 to advise how California should plan for future sea level rise. The report is to include:

- relative sea level rise projections for California, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates;

- the range of uncertainty in selected sea level rise projections;

- a synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems;

- a discussion of future research needs regarding sea level rise for California.

Furthermore, EO S-13-08 directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level affecting safety, maintenance, and operational improvements of the system and economy of the state. Caltrans continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Prior to the release of the final Sea Level Rise Assessment Report, all state agencies that are planning to construct projects in areas vulnerable to future sea level rise were directed to consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. However, all projects that have filed a Notice of Preparation, and/or are programmed for construction funding the next 5 years (through 2013), or are routine maintenance projects as of the date of EO S-13-08 may, but are not required to, consider these planning guidelines. Sea level rise estimates should also be used in conjunction with information regarding local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge, and storm wave data. (EO S-13-08 allows some exceptions to this planning requirement.)

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is an active participant in the efforts being conducted as part of Governor's Schwarzenegger's Executive Order on Sea Level Rise and is mobilizing to be able to respond to the National Academy of Science report on *Sea Level Rise Assessment,* which is due to be released by December 2010.

On August 3, 2009, the Natural Resources Agency, in cooperation and partnership with multiple state agencies, released the 2009 California Climate Adaptation Strategy Discussion Draft, which summarizes the best known science on climate change impacts in seven specific sectors and provides recommendations on how to manage against those threats. The release of the draft document set in motion a 45-day public comment period. Led by the California Natural Resources Agency, numerous other state agencies were involved in the creation of discussion draft, including Environmental Protection; Business, Transportation and Housing; Health and Human Services; and the

Department of Agriculture. The discussion draft focuses on sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. The strategy is in direct response to Gov. Schwarzenegger's November 2008 EO S-13-08 that specifically asked the Natural Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings. A revised version of the report was posted on the Natural Resource Agency website on December 2, 2009; it can be viewed at: http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF.

Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change impacts, Caltrans has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, the Caltrans will be able review its current design standards to determine what changes, if any, may be warranted in order to protect the transportation system from sea level rise.

4.7 Mitigation Measures for Significant Impacts under CEQA

4.7.1 Biological Resources

No formal mitigation is required, however the following measures below will be implemented.

4.7.1.1 Plant Species

STINGING PHACELIA

Stinging phacelia shall be avoided to the extent feasible and protected during construction, in coordination with Caltrans, including the SFOBB Environmental Compliance Branch and SFOBB Construction. Where avoidance is not feasible, replacement planting shall be provided.

The following measures shall be implemented to minimize impacts to stinging phacelia at a minimum 1:1 ratio:

1. Permanently preserve, through use of a conservation easement or other similar method, an equal amount of acres, either within the project area or off-site, that contains suitable habitat for the plant. Temporarily disturbed areas that can be restored after construction is complete will be the first priority for preservation if feasible.

2. Harvest the plants to be permanently lost or temporarily disturbed, and relocate them to the suitable and equal sized area either within the project site or off-site that would be avoided or restored and permanently preserved through a conservation easement or other similar method.

3. Harvest seeds from the plants to be permanently lost or temporarily disturbed, or use seeds from another appropriate source, and seed an equal amount of area

suitable for growing the plant either within the project site or off-site that would be avoided or restored and permanently preserved through a conservation easement or other similar method.

4. These measures shall be completed by a qualified biologist with experience working with the species.

5. A Monitoring Plan describing the requirements and performance standards shall be prepared and implemented if habitat is preserved or acquired for special-status plant species.

4.7.1.2 Animal Species

MONARCH BUTTERFLY, GUMMIFERA LEAF-CUTTER BEE, SAN FRANCISCO LACEWIND

If avoidance of any occupied habitat is not feasible or if occupied habitat is accidentally damaged during construction, habitat would be replaced at a location approved by the appropriate jurisdictional agency, which may include Caltrans, the SFCTA (CEQA lead agency), and/or CDFG. The habitat in the amount specified above would be acquired, permanently protected, and enhanced through management to compensate for the loss of habitat.

RAPTORS (COOPER'S HAWK, GOLDEN EAGLE, WHITE-TAILED KITE, AND OTHER NESTING RAPTORS) AND NONRAPTORS (SHOREBIRDS, MARSHBIRDS, AND WATERBIRDS)

Temporarily disturbed woodland and forested areas would be restored after completion of construction activities. Approximately 130 trees would be removed, of which approximately 90% are greater than 6.1 meters (20 feet) high with a trunk size greater than 30.5 centimeters (12 inches). Any trees removed in temporary disturbance areas would be replaced with native species appropriate to the island. Trees native to YBI that are removed, such as 2 Coast live oak trees, would be replaced at a 3:1 ratio. Other permanently affected habitat would be replaced at a location approved by the appropriate jurisdictional agency, which may include Caltrans, the Authority, and/or CDFG. A woodland habitat replacement plan would be developed 30 days prior to construction that outlines measures proposed for permanent and temporary habitat impacts, an implementation strategy, monitoring plan, performance standards, funding requirements, and long-term management.

TERRESTRIAL MAMMALS

Special-Status Bats

If special-status bats are found roosting within trees or structures on-site that require removal or if occupied habitat is accidentally damaged during construction, appropriate replacement roosts shall be created at a 1:1 ratio at a suitable location on-site or off-site in coordination with a qualified biologist and CDFG.

San Francisco Dusky Footed Woodrat

If San Francisco dusky-footed woodrat houses are found within portions of the project site that require permanent or temporary disturbance or if occupied habitat is accidentally damaged during construction, appropriate replacement houses/nests would be created at a 1:1 ratio at a suitable location on-site or off-site in coordination with a qualified biologist and CDFG. Follow-up monitoring efforts would be conducted to evaluate relocation success and additional measures may be necessary if relocated houses are not successful.

4.7.2 Cultural Resources

The MOA is being developed with input from SHPO. It would dictate a variety of tasks intended to avoid, minimize, or mitigate for impacts to the built environment. The MOA could include the following mitigation measures;

CONDUCT VIBRATION STUDIES

Prior to the commencement of any construction activity, measures to protect the buildings of the Senior Officers' Quarters Historic District, Quarters 1/Nimitz House, and Quarters 10/Building 267 from potential damage due to construction vibration will be developed and implemented prior to the commencement of any construction activity. Existing analysis derived from the SFOBB ESSSP would be used to inform the need for changes in construction methodology, shoring, and/or building stabilization, if consultation among the SHPO, SFCTA, and Caltrans/FHWA requires it.

PREPARATION OF HISTORIC STRUCTURES REPORTS AND CONDITIONS ASSESSMENTS

Historic Structure Reports (HSRs) would be prepared for Quarters 1/Nimitz House and Quarters 10/ Building 267. Detailed information is needed to assess what avoidance and protection measures are required to prevent adverse effects. The HSRs would be written in accordance with the standards established in *Preservation Brief 43: The Preparation and Use of Historic Structure Reports*, by Deborah Slaton, published by Heritage Preservation Services, National Park Service, 2005. The HSRs would include a history of the property/building, construction history, archaeology, architectural evaluation, conditions assessment, maintenance requirements, recommendations for proposed work, copies of original drawings and specifications if available, current drawings if different from the original, and historic and current photographs. Such information would also help facilitate future owners or operators' adaptive reuse of these buildings and structures.

STABILIZATION/MONITORING/SECURITY DURING CONSTRUCTION

Before the construction phase of the project, a comprehensive stabilization/monitoring plan would be prepared, if consultation among the SHPO, SFCTA, and Caltrans/FHWA requires it,. This plan could cover all potentially affected contributing elements, including historic structures and cultural landscape elements within the project area that are in proximity to construction activities. This plan would describe methods for the preservation, stabilization, shoring/underpinning, and monitoring of buildings, structures, and objects. The plan would also include provisions that high vibration construction techniques would be avoided in sensitive areas.

Underpinning and/or other stabilization and protective methods could be implemented at buildings located near project construction areas and that may be susceptible to damage or inadvertent destruction. A professional historical architect or architectural historian who meets the Secretary of the Interior's Professional Qualifications Standards (see 36

C.F.R. Regulations Part 61) would approve and monitor underpinning and stabilization activities. These same buildings would also require pre- and post-construction condition assessment reports.

INTERPRETATION OF HISTORIC PROPERTIES

Public interpretive material would be developed commensurate with the significance themes for the resources affected by the project. Interpretive products may include signage, panels and other appropriate media for interpretation. The interpretation would outline the history and significance of the cultural resources. Interpretive signage would be coordinated with that already planned by Caltrans as mitigation to the SFOBB ESSSP.

RELOCATION

If Alternative 2b is selected, Quarters 10/Building 267 shall be relocated and reconstructed in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties: Standards for Preservation, Rehabilitation, Restoration, and Reconstruction* (1995). The process for moving these buildings would follow the approach outlined in *Moving Historic Buildings* (Curtis 1979). In addition, Quarters 10/Building 267 would be relocated by a professional mover with demonstrated experience in the successful movement of historic buildings. These efforts would be conducted in consultation with the Office of Historic Preservation.

Appropriate steps would also be taken to ensure that buildings would be protected prior to moving to accommodate construction. Quarters 10/Building 267 would be protected in place until they are relocated. Measures taken for Quarters 10/Building 267 would include securing the building and providing security before, during, and following its relocation for a period of time agreed to Caltrans and the SFCTA. These provisions would follow recommended standards established in National Parks Service *Preservation Brief 31: Mothballing Historic Buildings* (Park 1993).

CULTURAL LANDSCAPE MONITORING AND PROTECTION MEASURES

Protection measures, such as ESA fencing, would be used to protect known resources during construction. These measures would be implemented for contributing elements of the Senior Officers' Quarters Historic District, including buildings and historic landscaping that are in proximity to the construction zone but are not anticipated to be impacted by demolition or construction activities related to the project. Protection measures outlined in mitigation stipulated by the MOA could include, but are not limited to, shoring and other stabilization methods, fencing, scaffolding and debris netting, and fire protection protocols such as no-smoking zones and other stabilization measures for structures as determined necessary to protect contributing resources or sensitive areas.

Monitoring of contributing elements of the Senior Officers' Quarters Historic District would be conducted in proximity to the project to support the protection measures for the built environment and the cultural landscape. Monitoring procedures would commence with preconstruction condition assessments of buildings and structures adjacent to the construction footprint to finalize monitoring requirements for built resources. If unexpected impacts to historic buildings or cultural landscape features are identified during construction, the provisions for protection, stabilization, or mitigation outlined in MOA would be followed in consultation with the U.S. Navy, SHPO.

This monitoring would be conducted by a professional architectural historian and/or a professional cultural landscape historian or landscape architect as appropriate, who meets the Secretary of the Interior's Professional Qualifications Standards.

REHABILITATION OF BUILDINGS AND REHABILITATION/RESTORATION OF CULTURAL LANDSCAPE FEATURES

The rehabilitation of Quarters 10/Building 267, and rehabilitation and/or restoration of cultural landscape features would be conducted in consultation with the Office of Historic Preservation and would follow the Secretary of the Interior's *Standards for the Treatment of Historic Properties: Standards for Preservation, Rehabilitation, Restoration, and Reconstruction* (1995) and National Parks Service *Preservation Brief 36: Protecting Cultural Landscapes: Planning, Treatment, and Management of Historic Landscapes* (Birnbaum 1994).

Only portions of the Senior Officers' Quarters Historic District landscape would be affected by the project. Therefore, only specific areas, or subareas, of the larger cultural landscape would be subject to treatment as part of the mitigation measures for the proposed project. Replanting would require coordination with natural resource restoration prescriptions and Caltrans landscape protocols.

MINOR REPAIRS AND RECONSTRUCTION

Inadvertent damage to historic properties, or to their contributing elements, would be repaired in accordance with the Secretary of the Interior's *Standards for Treatment of Historic Properties Standards for Preservation, Rehabilitation, Restoration, and Reconstruction* (1995). This would include damage to contributing elements such as landscaping, curbs, fencing, and related features, as well as contributing buildings, structures, and objects.

CONDUCT POSTCONSTRUCTION CONDITION ASSESSMENT, AND A REEVALUATION OF RESOURCES

Following completion of construction of the YBI Ramps, a postconstruction conditions assessment and reevaluation would be conducted to determine whether NRHP- listed resources continued to adequately meet listing criteria. This reevaluation would apply to Quarters 10/Building 267 to assess whether the property still retains sufficient historical integrity to convey its significance. This reevaluation would take place subsequent to the Yerba Buena Ramps Improvement Project completion.

4.7.3 Visual

Visual mitigation for adverse project impacts would consist of adhering to the following design requirements in cooperation with the District Landscape Architect.

4.7.3.1 Alternative 2b

Construction of the Alternative 2b design would in some cases have significant impacts on the visual quality of some areas when these areas are observed from certain viewpoints. This would be most noticeable where views toward or from the Senior Officers' Quarters Historic District would be dominated and/or obstructed by the ramp structures.

The design would incorporate landscaping to reduce the visual effect on the environment when the YBI ramps would be replaced. If Alternative 2b is implemented, vegetation removed during construction would be replaced, to the extent feasible, in areas that would aesthetically enhance the project site, and new vegetation would be planted in appropriate locations elsewhere on-site. However, given the large scale of the ramps, it would be difficult to screen or sufficiently offset their visual effects without in the process causing secondary significant visual effects.

To promote a seamless interaction between the ramps and the SFOBB Transition Structure, the ribbed design and materials used to finish the ramp structures would be compatible with those used to finish the Transition Structure.

4.7.3.2 Alternative 4

Implementation of Alternative 4 would require less vegetation removal than Alternative 2b. However, the sheer mass and extent of the design would produce an overall more visually dominant effect relative to Alternative 2b. If Alternative 4 is implemented, the design would incorporate landscaping to reduce the visual effect on the environment after ramp construction. However, given the large scale of the ramps, it would be difficult to screen or sufficiently offset their visual effects without in the process causing secondary significant visual effects.

To further mitigate the visual impact of the ramp structures associated with this alternative, the use of a ribbed design such as the one presented for Alternative 2b shall be implemented. This design technique would add aesthetic interest to the ramps and integrate the structures to appear as one project, thereby reducing their visual impact.

4.8 Mandatory Findings of Significance

The proposed project would result in no impacts to parks and recreation, community, utilities, and energy. The proposed project would result in less-than-significant impacts to land use, growth, emergency services, traffic and transportation/pedestrian and bicycle facilities, air quality, hydrology/water quality, geology/soils/seismic/topography, hazardous waste/materials, noise, and biological resources. The proposed project would result in potentially significant impacts to paleontological resources, however, implementation of the mitigation measures described in Section 4.7 would reduce these impacts to less-than-significant levels. Significant unavoidable impacts would occur for cultural and visual resources as described in Section 4.7 above, even with implementation of mitigation measures. Cumulative impacts of Alternative 2b and Alternative 4 are discussed in Section 3.20, Cumulative Impacts.

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CHAPTER 5 – COMMENTS AND COORDINATION

5.1 Coordination Plan

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts, and mitigation measures and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including project development team meetings, interagency coordination meetings, and the public scoping process. This chapter summarizes the results of the joint efforts of the SFCTA and Caltrans to identify, address, and resolve project-related issues through early and continuing coordination.

In September 2008, Caltrans prepared a SAFETEA-LU Coordination Plan for the project and invited agencies to become participating or cooperating agencies during the NEPA environmental review process. This plan is required by Section 6002 of the “Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users” (SAFETEA-LU), which is codified in 23 U.S.C. Sec. 139. The goals are to make the environmental review process more efficient and timely, provide a process for resolving interagency disagreements, protect environmental and community resources, and expedite approvals of urgently needed transportation improvements.

The Coordination Plan included the following:

i. Notice of initiation – A NEPA Notice of Intent for the project was circulated to the public and government agencies on September 5, 2008, inviting them to participate in the public scoping meeting or provide comment in written form regarding the scope of the EIS. The full NOI distribution list and the NOI and NOP are provided below.

FEDERAL AND STATE AGENCIES

Northwest Information Center
Attn: Leigh Jordan, Coordinator
Sonoma State University
1303 Maurice Avenue
Rohnert Park, CA 94928

California Department of Transportation
Attn: Tim Sable, IGR CEQA Branch
Office of Transportation Planning
PO Box 23660
Oakland, CA 94623-0660

California Integrated Waste Management Board
Attn: Reinhard Hohlwein
Sue O'Leary – CEQA
Permitting & Inspection Branch, MS#15
1001 "I" Street – PO Box 4025

Director
U.S. Coast Guard
Dept. of Homeland Security
Civil Engineering Division
Coast Guard Island, Building 54D
Alameda, CA 94501-5100

John Barna, Executive Director
California Transportation Commission
1120 N Street, Rm. 2221 (MS-52)
Sacramento, CA 95814

State Office of Intergovernmental Management
State Clearinghouse
1400 Tenth Street, Room 121
PO Box 3044
Sacramento, CA 95812-3044

Office of Historic Preservation
Attn: Milford Wayne Donaldson FAIA, SHPO
California Department of Parks and Recreation
PO Box 942896
Sacramento, CA 94296-0001

Jane Hicks, Regulatory
U.S. Corps of Engineers
Civil Works Office
333 Market St., Rm. 923
San Francisco, CA 94105

Director
State Lands Commission
Division of Research & Planning
100 Howe Ave., Suite 100 South
Sacramento, CA 95825-8202

California Department of Fish and Game
Central Coast Region
Habitat Conservation
PO Box 47
Yountville, CA 94599

U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Wayne Nastri, Region 9 Administrator
U.S. Environmental Protection Agency
75 Hawthorne St.
San Francisco, CA 94105

Larry Myers, Executive Secretary
CA Native American Heritage Commission
915 Capitol Mall, Rooom 364
Sacramento, CA 95814

REGIONAL AGENCIES

Association of Bay Area Governments
Attn: Suzan Ryder
PO Box 2050
Oakland, CA 94604-2050

Bay Area Rapid Transit District (BART)
Attn: Val Menotti
300 Lakeside Dr., 16th Floor
Oakland, CA 94612

Dennis Baker, Chief of Operations
City of Daly City
Wastewater Treatment Plant
153 Lake Merced Blvd.
Daly City, CA 94015

Regional Water Quality Control Board
Attn: Judy Huang
San Francisco Bay Region
1515 Clay St., Suite 1400
Oakland, CA 94612

Metropolitan Transportation Commission
Attn: Craig Goldbratt
101 – 8th Street
Oakland, CA 94607

Brady McCrea,
San Francisco Bay Conservation and Development Commission
50 California St., #2600
San Francisco, CA 94111

*Bay Area Air Quality Management District
Attn: Joseph Steinberger
939 Ellis Street
San Francisco, CA 94109

Mr. Alan Zahradnik
Director of Planning and Policy Analysis
Golden Gate Bridge, Highway and Transportation District
1011 Anderson Drive
San Rafael, CA 94901

CITY AND COUNTY OF SAN FRANCISCO

San Francisco Architectural Heritage
Attn: Executive Director
2007 Franklin Street
San Francisco, CA 94109

Department of Building Inspection
Attn: Isam Hasenin – Director
1660 Mission Street
San Francisco, CA 94103

Mayor's Office of Community Development
Attn: Adrienne Pon, Dirctor
1 South Van Ness, 5th Floor
San Francisco, CA 94103

Wastewater Enterprise
SFPUC
Attn: Ed Ho
1145 Market Street, 5th Floor
San Francisco, CA 94103

Michael Cohen
Mayor's Office of Economic & Workforce Develop.
City Hall, Room 448
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1650 Mission Street, Ste. 400
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Attn: Linda Avery, Commission Secretary

Landmarks Preservation Advisory Board
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State & Local Documents Division
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ramps located on the east side of YBI with new westbound on- and off-ramps that replicate the functional role of the current ramps and also address seismic, traffic safety requirements, and design standards. The feasibility of improving the geometric configuration of the current eastbound off-ramp on the eastern side of YBI to Hillcrest Road will also be included. The YBI Ramps Improvement Project is separate and independent of both the SFOBB East Span Seismic Safety Project currently under construction, and the Treasure Island and Yerba Buena Island (TI/YBI) Redevelopment Plan, which is currently undergoing its own environmental review process. The proposed new ramps would improve traffic and seismic safety of the ramps and provide connections between YBI and the transition structure of the new SFOBB. The proposed project is located between Post Mile (PM) 7.8 and 8.1 starting at the east portal of the YBI tunnel and ending before the SFOBB Transition Structure.

The purpose of the project is to address geometric and operational deficiencies of the existing on- and off-ramps, improve traffic operations to and from the SFOBB and improve traffic safety by increasing deceleration length for the eastbound and westbound off-ramps, and increasing merging distance for eastbound and westbound on-ramps. Preliminary alternatives under consideration for the EIS/EIR include:

(1) No Build Alternative, which assumes that the existing on- and off-ramps would remain in place and no further action or improvements would occur;

(2) Alternative 2B, which would include the removal of the existing westbound on- and off-ramps on the east side of YBI, construction of a westbound off-ramp to Macalla Court on the east side of YBI, construction of a westbound hook on-ramp from Macalla Court on the east side of YBI. The feasibility of incorporating improvements to the current eastbound off-ramp on the eastern side of YBI to Hillcrest Road will be studied; and,

(3) Alternative 4, which would include the removal of the existing westbound on- and off-ramps on the east side of YBI, the construction of westbound on-ramp from Hillcrest Road, the construction of westbound off-ramp from Macalla Court on the east side of YBI. The feasibility of incorporating improvements to the current eastbound off-ramp on the eastern side of YBI to Hillcrest Road will be studied.

Anticipated Federal approvals or permits include, U.S. Fish and Wildlife Service (USFWS) Section 7 Endangered Species Act, Consultation, Sections 401 and 404 of the Clean Water Act, Section 4(f) of the Transportation Act of 1966, Section 6(f) Land and Water Conservation Fund Act, Section 10 Army Corp of Engineers (ACOE), Section 9 Coast Guard, and determination of consistency with the Federal Coastal Zone Management Act by the San Francisco Bay Conservation and Development Commission.

Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, State, participating agencies (including federally recognized Tribal governments, if any), local agencies, and private organizations and citizens who have previously expressed or are known to have interest in this proposal. The NEPA environmental process for the proposed project began in June 2008. A public scoping meeting is scheduled to be held at the Port of San Francisco office, in the Bayside Conference Room located at Pier 1, The Embarcadero, San Francisco, CA 94111 on Wednesday, September 24, 2008 from 6:30 to 8 p.m.

In addition, at least one public hearing will be held after the publication of the Draft EIS/EIR. Public notice will be given of the time and place of the meeting and hearing (as applicable). The Draft EIS/EIR will be available for public and agency review and comment prior to the public hearing.

To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties. Comment or questions concerning this proposed action and the EIS should be directed to Eric Cordoba, Project Manager for the Authority, with a copy of comment sent to Melanie Brent, Caltrans Office Chief. Written comments must be received no later than 5 p.m. on October 6, 2008 and should be sent to Eric Cordoba at the Authority, with a copy of the comment sent to Melanie Brent at Caltrans at the addresses listed above.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.)

Issued on: September 5, 2008.

Nancy E. Bobb,

Director, State Programs, Federal Highway Administration, Sacramento, California.

[FR Doc. E8–20698 Filed 9–5–08; 8:45 am]

BILLING CODE 4910–22–P

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

Notice of Application for Approval of Discontinuance or Modification of a Railroad Signal System or Relief From the Requirements of Title 49 Code of Federal Regulations Part 236

Pursuant to Title 49 Code of Federal Regulations (CFR) Part 235 and 49 U.S.C. 20502(a), the following railroad has petitioned the Federal Railroad Administration (FRA) seeking approval for the discontinuance or modification of the signal system or relief from the requirements of 49 CFR Part 236, as detailed below.

[Docket Number FRA–2008–0094]

Applicant: Wheeling & Lake Erie Railway Company, Mr. Dan Reinsel, Signal & Communications Supervisor, 100 East First Street, Brewster, OH 44613.

The Wheeling & Lake Erie Railway Company seeks approval of the proposed discontinuance of the signal system governing movements over the Maumee River turn span bridge at MP 2.38, Toledo, Ohio.

The reason given for the proposed changes is that a damaged mechanical circuit coupler located on the east end of the turn span is no longer in production and attempts to secure a replacement have been unsuccessful. Replacement of the entire system would be of excessive cost given the amount of rail traffic across the bridge.

Any interested party desiring to protest the granting of an application shall set forth specifically the grounds upon which the protest is made, and include a concise statement of the interest of the party in the proceeding. Additionally, one copy of the protest shall be furnished to the applicant at the address listed above.

FRA expects to be able to determine these matters without an oral hearing. However, if a specific request for an oral hearing is accompanied by a showing that the party is unable to adequately present his or her position by written statements, an application may be set for public hearing.

All communications concerning this proceeding should be identified by Docket Number FRA–2008–0094 and may be submitted by one of the following methods:

- *Web site:* *http://www.regulations.gov*. Follow the instructions for submitting comments on the DOT electronic site;
- *Fax:* 202–493–2251;
- *Mail:* Docket Management Facility, U.S. Department of Transportation, 1200

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to award discretionary grants are made on the basis of a number of factors, including project evaluation under the National Priority System and the current operations and number of aircraft that are based at an airport. Nonprimary airports that have not provided verifiable data on the number of based aircraft at the airport deprive FAA of a tool for reviewing discretionary requests. Therefore, if a nonprimary airport has not provided a list of based aircraft at the airport, including "N-number", FAA will consider the failure to provide the information as a factor when considering a request from the airport for discretionary funding.

Issued in Washington, DC on August 27, 2008.

Wayne Heibeck,

Deputy Director, Office of Airport Planning and Programming.

[FR Doc. E8–20459 Filed 9–5–08; 8:45 am]

BILLING CODE 4910–13–M

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Aviation Rulemaking Advisory Committee Meeting on Transport Airplane and Engine Issues

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of public meeting.

SUMMARY: This notice announces a public meeting of the FAA's Aviation Rulemaking Advisory Committee (ARAC) to discuss transport airplane and engine (TAE) issues.

DATES: The meeting is scheduled for Wednesday, October 1, 2008, starting at 9 a.m. Pacific Daylight Time. Arrange for oral presentations by September 16, 2008.

ADDRESSES: FAA–Northwest Mountain Region Office, Transport Standards Staff conference room, 1601 Lind Ave. SW., Renton, WA 98507.

FOR FURTHER INFORMATION CONTACT: Ralen Gao, Office of Rulemaking, ARM–209, FAA, 800 Independence Avenue, SW., Washington, DC 20591, Telephone (202) 267–3168, FAX (202) 267–5075, or e-mail at *ralen.gao@faa.gov*.

SUPPLEMENTARY INFORMATION: Pursuant to Section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92–463; 5 U.S.C. app. III), notice is given of an ARAC meeting to be held October 1, 2008.

The agenda for the meeting is as follows:

- Opening Remarks, Review Agenda and Minutes.
- FAA Report.
- Excom Report.
- Transport Canada Report.
- Airplane-level Safety Analysis Working Group Report.
- Task 4 Status.
- Propeller Harmonization Working Group (HWG) Report.
- Ice protection HWG Report.
- Airworthiness Assurance HWG Report.
- Avionics HWG Report.
- Halon Replacement as Fire Extinguishing Agent.
- Any Other Business.
- Action Item Review.

Attendance is open to the public, but will be limited to the availability of meeting room space. Please confirm your attendance with the person listed in the **FOR FURTHER INFORMATION CONTACT** section no later than September 16, 2008. Entrance to the FAA facility will require presentation of a valid passport or state-issued (US) identification (e.g. driver's license). Please plan on arriving at least 20 minutes in advance of meeting to facilitate entrance screening.

For persons participating by telephone, the call-in number is (202) 366–3920; the pass code is "2816." To insure that sufficient telephone lines are available, please notify the person listed in the **FOR FURTHER INFORMATION CONTACT** section of your intent to participate by telephone by September 16, 2008. Anyone calling from outside the Seattle, WA metropolitan area will be responsible for paying long-distance charges.

The public must make arrangements by September 16, 2008, to present oral statements at the meeting. Written statements may be presented to the ARAC at any time by providing 25 copies to the person listed in the **FOR FURTHER INFORMATION CONTACT** section or by providing copies at the meeting. Copies of the documents to be presented to ARAC for decision by the FAA may be made available by contacting the person listed in the **FOR FURTHER INFORMATION CONTACT** section.

If you need assistance or require a reasonable accommodation for the meeting or meeting documents, please contact the person listed in the **FOR FURTHER INFORMATION CONTACT** section. Sign and oral interpretation, as well as a listening device, can be made available if requested 10 calendar days before the meeting.

Issued in Washington, DC on September 3, 2008.

Pamela Hamilton-Powell,

Director, Office of Rulemaking.

[FR Doc. E8–20747 Filed 9–5–08; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Environmental Impact Statement and Environmental Impact Report: San Francisco, CA

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of Intent (NOI) to prepare a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

SUMMARY: The FHWA, on behalf of the California Department of Transportation (Caltrans), and The San Francisco County Transportation Authority (Authority), is issuing this notice to advise the public that an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) will be prepared for the proposed Yerba Buena Island (YBI) Ramps Improvement Project on Interstate 80 (I–80) in San Francisco County, California.

FOR FURTHER INFORMATION CONTACT: Eric Cordoba, San Francisco County Transportation Authority, 100 Van Ness Avenue, 26th Floor, San Francisco, CA 94102, Telephone (415) 955–2904 or Melanie Brent, Caltrans District 4 Office of Environmental Analysis, 111 Grand Avenue, Oakland, CA 94623, Telephone (510) 286–5231.

SUPPLEMENTARY INFORMATION: Effective July 1, 2007, the Federal Highway Administration (FHWA) assigned, and the California Department of Transportation (Caltrans) assumed, National Environmental Policy Act (NEPA) environmental responsibilities for highway projects pursuant to 23 U.S.C. 327. In cooperation with Caltrans, the Authority will prepare a joint EIS/EIR for the proposed YBI Ramps Improvement Project at Yerba Buena Island in the City and County of San Francisco, California. Caltrans is the lead agency under NEPA and the Authority is the lead agency under the California Environmental Quality Act (CEQA).

YBI is located in San Francisco Bay, between Oakland and San Francisco, and is accessible by vehicles only via the San Francisco-Oakland Bay Bridge (SFOBB), which is a critical link in the interstate network, providing access between San Francisco and the East Bay. The only access to Treasure Island, located north of YBI, and the only land access to the active U.S. Coast Guard facilities on the south side of YBI, is also from the SFOBB and the associated on- and off-ramps.

The proposed project would replace the existing westbound on- and off-

San Francisco County Transportation Authority

100 Van Ness Avenue 26th Floor
San Francisco, California 94102
VOICE 415.522.4800 FAX 415.522.4829
info@sfcta.org www.sfcta.org

September 5, 2008

Subject: Notice of Preparation – Environmental Impact Report for the Yerba Buena Island Ramps Improvement Project

Dear Responsible Agencies, Organizations, and Interested Parties:

The San Francisco County Transportation Authority (Authority) proposes to remove the westbound on-ramp and the westbound off-ramp located on the eastern side of Yerba Buena Island (YBI). A new westbound on-ramp and a new westbound off-ramp - that replicate the functional roles of the current ramps on the eastern side of YBI - would be constructed. The replacement ramps would address design standards, and seismic and traffic safety requirements. For the proposed action, the Authority is preparing an Environmental Impact Report (EIR) under the provision of the California Environmental Quality Act (CEQA). The project involves a federal action and is therefore also subject to review under the National Environmental Policy Act (NEPA). The environmental document will be a joint environmental impact statement/environmental impact report (EIS/EIR) and is hereinafter referred to as the EIS/EIR.

The Authority is the Lead Agency under CEQA. The California Department of Transportation (Caltrans) is the Lead Agency under NEPA. We need to know the views of your agency regarding the scope and content of the environmental information germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIS/EIR prepared by our agency when considering your permit or other approval for the project.

Moving the City.

This YBI Ramps Improvement Project is separate from both the San Francisco Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project, which is currently under construction and the Treasure Island and Yerba Buena Island (TI/YBI) Redevelopment Plan, which is currently undergoing its own environmental review process. The YBI Ramps Improvement Project has been proposed to address the geometric and operational deficiencies of the existing westbound on-ramp and existing westbound off-ramp on the eastern side of YBI and their effects on the San Francisco-Oakland Bay Bridge (I-80) mainline, without degrading the mainline operation as compared to the no-action alternative. This project would improve safety, and facilitate traffic operations, at the I-80/YBI interchange by replacing the westbound on-ramp and the westbound off-ramp located on the eastern side of YBI. The feasibility of improving the geometric configuration and operations of the current eastbound off-ramp on the eastern side of YBI to Hillcrest Road will also be studied. A more detailed project description, project location map, and project vicinity map, are contained in the attached materials.

CEQA Guidelines Section 15082(b) mandates that each Responsible Agency must respond to a NOP within thirty (30) days after receipt. The review period for the YBI Ramps Improvement Project will extend from September 5, 2008 through October 6, 2008.

NOTICE OF PREPARATION (NOP) ATTACHMENT

YERBA BUENA ISLAND RAMPS IMPROVEMENT PROJECT

Environmental Impact Statement/Environmental Impact Report (EIS/EIR)

The San Francisco County Transportation Authority (Authority), and California Department of Transportation (Caltrans) as the Lead Agencies under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) respectively, will prepare an Environmental Impact Report/Environmental Impact Statement (EIS/EIR) for the following project:

PROJECT TITLE: YERBA BUENA ISLAND RAMPS IMPROVEMENT PROJECT

The Authority requests the views of your agency on the scope and content of the environmental information relevant to your agency's jurisdictional or regulatory responsibilities. If your agency is a responsible agency or trustee agency as defined by State California Environmental Quality Act (CEQA) Guidelines (Sections 15381 and 15386), your agency will need to use the EIS/EIR prepared for this project when considering your permit or other approval for the project. If your agency is not a responsible or trustee agency as defined by CEQA guidelines, or if you are an interested individual or organization, we would still appreciate your views on the scope of the environmental document for this project.

The project description, location, and probable environmental effects are described herein, along with date, time, and location of the project scoping meeting. The project has the potential to have a significant effect on the environment, and therefore an EIS/EIR is required pursuant to State CEQA Guidelines 15060(d). No initial study has been prepared. The review period for the Yerba Buena Island (YBI) Ramps Improvement Project will extend from September 5, 2008 through October 6, 2008. Written comments must be received at the Authority office no later than 5 p.m. on October 6, 2008 and sent to **Eric Cordoba, Project Manager; San Francisco County Transportation Authority; 100 Van Ness Avenue, 26th Floor; San Francisco, CA 94102.** Phone: (415) 955-2904. Fax: (415) 522-4829. E-mail: eric@cordobaconsulting.com, with a copy of the comment sent to **Melanie Brent, Caltrans District 4 Office of Environmental Analysis, 111 Grand Avenue, Oakland CA 94623.** Telephone (510) 286-5231. Please include the name of an appropriate contact person in your agency for continued EIS/EIR coordination.

PROJECT DESCRIPTION

YBI is located in the San Francisco Bay, approximately halfway between Oakland and San Francisco, and is accessible by vehicles only via the San Francisco-Oakland Bay Bridge (SFOBB), part of Interstate 80. The SFOBB is a critical link in the interstate network, providing access between San Francisco and the East Bay. YBI and the SFOBB also provide access to Treasure Island, which lies to the north of YBI. YBI and Treasure Island are accessed by on-and off-ramps located on the upper and lower decks of the SFOBB. The SFOBB and the associated

Written comments must be received at the Authority office by 5 p.m. on October 6, 2008 and sent to **Eric Cordoba, Project Manager; San Francisco County Transportation Authority; 100 Van Ness Avenue, 26th Floor; San Francisco, CA 94102.** Phone: (415) 955-2904. Fax: (415) 522-4829. E-mail: eric@cordobaconsulting.com, with a copy of the comment sent to **Melanie Brent, Caltrans District 4 Office of Environmental Analysis, 111 Grand Avenue, Oakland CA 94623.** Telephone (510) 286-5231. Please include the name of an appropriate contact person in your agency for continued EIS/EIR coordination.

A copy of the Notice of Preparation and Notice of Intent can be found on the Authority's website, at http://www.sfcta.org

Your views and comments on how the project may affect the environment are welcomed. Please contact Mr. Cordoba at (415) 955-2904 if you have any questions.

David J.G. Murray

David Murray
Deputy Director for Finance and Administration
San Francisco County Transportation Authority

September 5, 2008
Date

Attachments (1)

cc: EC, LC - Chron, File: YBI Ramps Improvement Project NOI/NOP on- and off-ramps provide the only land access to the active U.S. Coast Guard facilities located on the southern side of YBI.

The proposed project would replace the existing westbound on-ramp and the westbound off-ramp located on the eastern side of YBI with a new westbound on-ramp and a new westbound off-ramp that replicate the functional roles of the current ramps. The replacement ramps would also address seismic and traffic safety requirements, and design standards. The feasibility of improving the geometric configuration and operations of the current eastbound off-ramp on the eastern side of YBI to Hillcrest Road will also be studied.

Build Alternatives have been proposed to address the geometric and operational deficiencies of the existing on-and off-ramps and their effects on the SFOBB (I-80) mainline without degrading the mainline operation as compared to the no-action. This YBI Ramps Improvement Project is separate and independent of the SFOBB East Span Seismic Safety Project, which is currently under construction and the Treasure Island and Yerba Buena Island (TI/YBI) Redevelopment Plan, which is currently undergoing its own environmental review process. The proposed new ramps would improve traffic and seismic safety of the ramps and provide connections between YBI and the transition structure of the new SFOBB. The proposed project is located between Post Mile (PM) 7.8 and 8.1 starting at the east portal of the YBI tunnel and ending before the SFOBB Transition Structure.

PURPOSE AND NEED

The purpose of the project is to address the geometric and operational deficiencies of the existing on- and off-ramps, to the extent physically and economically feasible; improve traffic operations to and from the SFOBB and improve traffic safety by increasing deceleration length for the eastbound and westbound off-ramps, and increasing merging distance for eastbound and westbound on-ramps.

The YBI ramps currently do not meet Caltrans geometric standards. They have not been significantly updated since the 1960s and are seismically unsafe. Due to their non-standard entrances and exits, these ramps act as a traffic operational constraint. In addition, the deceleration length of the off-ramps and the merging distance for the on-ramps are insufficient and not up to current standards. The limited merging and deceleration distances make it challenging for vehicles to enter and exit traffic flows on the SFOBB.

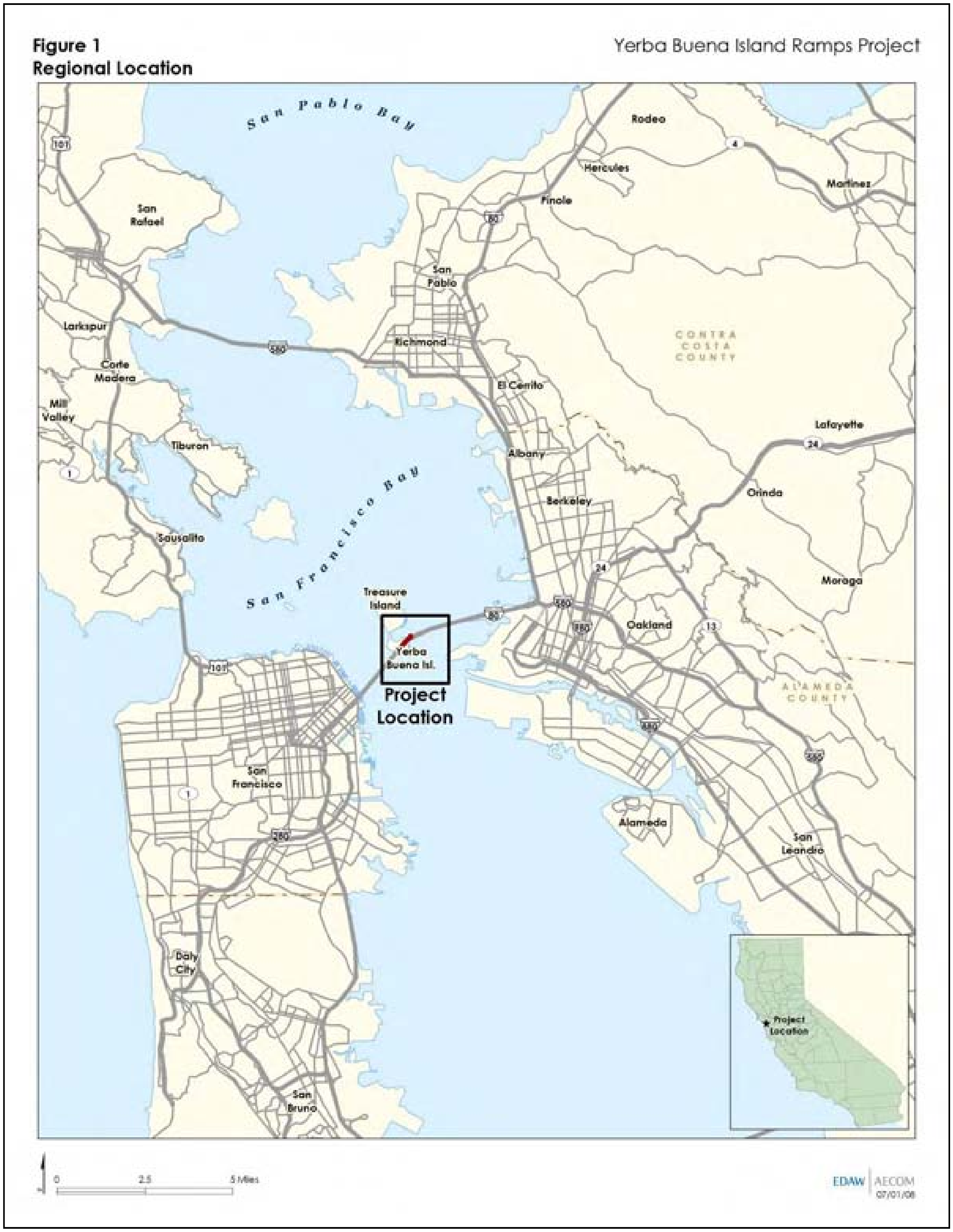
Figure 1
Regional Location
Yerba Buena Island Ramps Project
San Pablo Bay
Rodeo
Hercules
Martinez
Pinole
San Rafael
San Pablo
Larkspur
Richmond
CONTRA COSTA COUNTY
Corte Madera
El Cerrito
Mill Valley
Lafayette
Tiburon
Albany
San Francisco Bay
Berkeley
Orinda
Sausalito
Moraga
Treasure Island
Oakland
Yerba Buena Isl.
Project Location
ALAMEDA COUNTY
San Francisco
Alameda
San Leandro
Daly City
Project Location
San Bruno
0
2.5
5 Miles
EDAW AECOM
07/01/08

Figure 2
Project Vicinity

Yerba Buena Island Ramps Project

THE PROJECT AND PROJECT ALTERNATIVES

Preliminary alternatives under consideration for the EIS/EIR include:

(1) No Build Alternative, which assumes that the existing on- and off-ramps would remain in place and no further action or improvements would occur;

(2) Alternative 2B, which would include the removal of the existing westbound on- and off-ramps on the east side of YBI, construction of a westbound off-ramp to Macalla Court on the east side of YBI, and construction of a westbound hook on-ramp from Macalla Court on the east side of YBI. The feasibility of incorporating improvements to the current eastbound off-ramp on the eastern side of YBI to Hillcrest Road will be studied.;

(3) Alternative 4, which would include the removal of the existing westbound on- and off-ramps on the east side of YBI, the construction of westbound on-ramp from Hillcrest Road, and construction of westbound off-ramp from Macalla Court on the east side of YBI. The feasibility of incorporating improvements to the current eastbound off-ramp on the eastern side of YBI to Hillcrest Road will be studied.; and,

(4) Other alignment alternatives that emerge from the scoping and alternatives analysis process.

POTENTIAL ENVIRONMENTAL EFFECTS TO BE ANALYZED

Potential environmental effects would be analyzed for the following issue areas:

- Land Use
- Consistency with State, Regional, and Local Plans and Programs
- Parks and Recreational Facilities
- Growth
- Farmland/Agricultural Lands
- Community Services
- Environmental Justice
- Utilities and Emergency Services
- Traffic and Transportation
- Visual/Aesthetics
- Historic and Cultural Resources
- Hydrology and Floodplain
- Water Quality and Stormwater Runoff
- Geology, Soils, and Seismicity
- Paleontology
- Hazardous Waste/Materials
- Air Quality
- Noise and Vibration
- Biological Resources

- Wetlands and Other Waters of the U.S.

Caltrans and the Authority will evaluate the impacts of each alternative. To ensure that the full range of issues to this proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties.

THE EIS/EIR PROCESS AND THE ROLE OF PARTICIPATING AGENCIES AND THE PUBLIC

In accordance with 23 CFR 771.105(a) and 771.133 and with CEQA and the implementing regulations, Caltrans and the Authority will comply with all applicable Federal and state environmental laws, regulations, and federal executive orders applicable to the proposed project during the environmental review process. These requirements include, but are not limited to, the regulations of the Council on Environmental Quality and Caltrans implementing NEPA (40 CFR parts 1500-1508, and 23 CFR Part 771), the project-level air quality conformity regulation of the U.S. Environmental Protection Agency (EPA) (40 CFR part 93), the Section 404(b)(1) guidelines of EPA (40 CFR part 230), the regulation implementing Section 106 of the National Historic Preservation Act (36 CFR Part 800), the regulation implementing section 7 of the Endangered Species Act (50 CFR part 402), Section 4(f) of the 1966 DOT Act (23 CFR 771.135; 49 U.S.C. 303), Section 401 and 404 of the Clean Water Act, Section 6(f) Land and Water Conservation Fund Act, Section 10 Army Corps of Engineers (ACOE), Section 9 Coast Guard, determination of consistency with the federal Coastal Zone Management Act by the San Francisco Bay Conservation and Development Commission, federal Executive Orders 12898 on environmental justice, 11988 on floodplain management, and 11990 on wetlands, and the CEQA laws and regulations. The Authority Board would certify the EIR. Caltrans would certify the EIS, approve the project and project design, and would be responsible for project construction.

Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, state, participating agencies (including federally recognized Tribal governments, if any), and local agencies, and to private organizations and citizens who have previously expressed or are known to have interest in this proposal.

To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties. Comment or questions concerning this proposed action and the EIS/EIR should be directed to Eric Cordoba, Project Manager for the Authority, with a copy of comment sent to Melanie Brent, Caltrans Office Chief at the addresses listed at the end of this attachment.

SCOPING MEETINGS

A public scoping meeting is scheduled to be held at the Port of San Francisco office, in the Bayside Conference Room located at Pier 1, The Embarcadero, San Francisco, CA 94111 on Wednesday, September 24, 2008 from 6:30 to 8:00 p.m. Written comments on the scope of alternatives and impacts to be considered must be received at the Authority office no later than 5 p.m. on October 6, 2008 and should be sent to the Authority with a copy of the comment sent to Caltrans at the addresses below.

In addition, at least one public hearing will be held after the publication of the Draft EIS/EIR. Public notice will be given of the time and place of the meeting and hearing (as applicable). The Draft EIS/EIR will be available for public and agency review and comment prior to the public hearing.

ADDRESSES/CONTACT LIST/FURTHER INFORMATION

Written comments during scoping or on the proposed project in general should be sent to: **Eric Cordoba, Project Manager; San Francisco County Transportation Authority; 100 Van Ness Avenue, 26th Floor; San Francisco, CA 94102.** Phone: (415) 955-2904. Fax: (415) 522-4829. E-mail: eric@cordobaconsulting.com with a copy of the comment sent to **Melanie Brent, Caltrans District 4 Office of Environmental Analysis, 111 Grand Avenue, Oakland CA 94623.** Telephone (510) 286-5231.

To be added to the mailing list for the YBI Ramps Improvement Project, contact Mr. Cordoba at the address listed above.

ii. Process for inviting participating agencies – On September 5, 2008, Caltrans sent out letters inviting key stakeholder agencies and local interest groups to become cooperating or participating agencies in the YBI Ramps Improvement Project environmental review process. In November 2010, Caltrans sent out an invitation to agencies and local interest groups for an opportunity to hear an update on the project alternatives and potential environmental impacts, which was held on December 7, 2010.

Agencies invited to participate included:

- California Transportation Commission
- U.S. Army Corps of Engineers (USACE)
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Environmental Protection Agency (USEPA)
- U.S. Department of the Interior (USDOI)
- USCG
- U.S. Navy
- California Department of Fish and Game (CDFG)
- Regional Water Quality Control Board San Francisco Bay Region (SFRWQCB)
- Bay Area Air Quality Management District (BAAQMD)
- California Air Resources Board
- Association of Bay Area Governments (ABAG)
- Federal Transit Administration (FTA)
- Federal Highway Administration (FHWA)
- San Francisco Bay Conservation and Development Commission (BCDC)
- California Department of Parks and Recreation State Office of Historic Preservation (SHPO)
- State Lands Commission
- San Francisco Planning Department
- Treasure Island Development Authority (TIDA)
- San Francisco Mayor’s Office of Base Reuse and Development
- Mayor’s Office of Community Development
- San Francisco Architectural Heritage
- California Native American Heritage Commission (NAHC)
- San Francisco Bicycle Coalition
- Metropolitan Transportation Commission for the San Francisco Bay Area (MTC)

- San Francisco Municipal Transportation Agency (SFMTA).

The following agencies responded to be participating agencies:

- USCG – cooperating agency
- U.S. Navy – participating agency
- USEPA – participating agency
- USDOI – participating agency
- FHWA – participating agency
- FTA – participating agency
- USACE – participating agency
- USFWS – participating agency
- CDFG – participating agency
- SFRWQCB – participating agency
- TIDA – participating agency
- SFMTA – participating agency

iii. Opportunities for involvement by these agencies were given on:

- Purpose and need – This was contained in the Notice of Intent (NOI) sent on September 5, 2008, along with the invitation letter.

- Range of alternatives – These were contained in the NOI sent on September 5, 2008, along with the invitation letter.

- Update on the project alternatives and potential environmental impacts – This meeting was held on December 7, 2010.

- Preferred alternative – The preferred alternative has not yet been identified.

iv. Process for early identification of issues – Opportunities to identify issues early were provided on September 5, 2008. In November 2010, agencies included in the full list under item (ii) above were contacted to request participation in a briefing of the draft findings in the draft EIR/EIS. The meeting was held on December 7, 2010 and the following agencies participated:

- U.S. Navy
- USCG
- USEPA
- USDOI
- SFRWQCB
- BCDC

v. Permits and approvals -. Permits required for the project may include:

Approval Agency	Permit/Approval/Determination	Status
BCDC	Consistency Determination	Anticipate After ROD
SHPO	Section 106 concurrence and MOA	Anticipate between Draft and Final
Regional Water Quality Control Board	NPDES Statewide Permit (Order No. 99-06-DWQ) Dewatering permit (R2-2007-0033) 401 Water Quality Certification Permit	After ROD After ROD After ROD
Air Pollution Control District	Permit to Construct	After ROD
USACE	404 Nationwide Permit (NWP 14)	Pre-construction notification
USCG	Section 9 Permit Requirements MOU to ensure existing MOA and license criteria currently in effect with the SFOBB ESSSP will apply to the YBI Ramps Improvement Project Encroachment Permit	After ROD Anticipate between Draft and Final EIR/EIS After ROD
MTC	Air Quality $PM_{2.5}$	Anticipate between Draft and Final

5.2 Scoping Process

The scoping process was launched with the publication of the NEPA NOI and CEQA Notice of Preparation (NOP). The NOI was published in the Federal Register on September 8, 2008, and the NOP was published on September 5, 2008 in local newspapers. The NOP was circulated to stakeholder agencies through the California State Clearinghouse on September 5, 2008, and to additional agencies, organizations, and the general public through direct mail. The NOP was advertised in local newspapers (San Francisco Chronicle, Contra Costa Times, and Oakland Tribune) on September 5, 2008, along with information about the scoping meeting and scoping comment period.

Scoping Meeting – The scoping meeting was held on September 24, 2008, from 6:30 to 8:30 p.m. at the Port of San Francisco conference room, which is located at Pier 1, The Embarcadero, in San Francisco, California. Information boards were set up around the room and staffed by Caltrans and the SFCTA, as well as project consultants. A court reporter was available to record comments. Attendees at the scoping meeting included Arc Ecology, Paul Svedersky, and TICD. Issues raised at the meeting included concern as to whether greenhouse gas issues would be studied; potential for contributing to intensity of growth on TI by removing traffic impacts of planned redevelopment project, relationship of this project Draft EIR/EIS to the EIR being produced for the TI/YBI Development Project, and a suggestion that the traffic analysis look at a comprehensive region relative to the highway system that is affected by the bridge, reaching as far south as Cesar Chavez and reaching into the East Bay.

During the 30-day scoping period from September 5, 2008, through October 6, 2008, letters were received from the following agencies and organizations:

- USCG
- USEPA Region 9
- California Regional Water Quality Control Board – San Francisco Bay Region
- California Transportation Commission
- Bay Conservation and Development Commission
- San Francisco Municipal Transportation Agency
- San Francisco Bike Coalition
- San Francisco Bay Trail
- East Bay Bike Coalition

Issues raised in these scoping comment letters include:

- Maintaining unfettered, uninterrupted access to and from USCG facilities on YBI;
- Recommendation that the project be funded;
- Review for consistency with Section 309 of the CAA and consideration of air quality impacts, including GHG emissions;
- Guidance from USEPA on cumulative impact assessment methodology; protection of historic and cultural resources, and environmental justice analysis;
- Potential for water and wetlands impacts;
- Potential impacts to CWA Section 404 Waters;
- Potential for polluted storm water runoff and treatment requirements to preserve water quality;
- Potential for impacts on public access and view corridors;
- Potential impacts on fish, aquatic organisms, and other wildlife;
- Potential impacts on biological resources, including threatened and endangered species, critical habitats, and invasive species concerns;
- Potential impacts on bay water surface area, volume and circulation; questions about whether the project would come under the jurisdiction of the BCDC;
- Request for details on how the new ramps would accommodate bicycles, pedestrians, wheelchairs and transit connections (consistency with the separated multiuse path on the new Bay Bridge East Span), as well as connections to existing and proposed trail systems on TI and YBI.
- Request for review of the Bay Trail Plan and discussion of possible impacts from the project.

5.3 Consultation with Public Agencies

In addition to the SAFETEA-LU Coordination Plan and Scoping Process, the following meetings and presentations have been conducted in support of the YBI environmental review:

- Meetings with BCDC occurred on 2/11/09, 6/4/09, 10/5/09, and 6/7/10.
- Meeting with the Toll Bridge Program Oversight Committee (TBPOC) on 10/6/10 to obtain structural Contract Change Order (COO) approval.
- Presentation to agencies on 12/7/2010 to present a summary of project alternatives and potential environmental impacts.
- Meeting with the SFCTA Community Advisory Committee on 4/22/09 to present the project alternatives and solicit comments from the members.
- Presentations to the TIDA Community Advisory Board on 4/6/09 and TIDA Board on 4/8/09 to brief them on the project and answer questions.
- More than 15 project development team meetings and numerous focused technical meetings have been held with Caltrans to discuss design issues pertaining to geometry, drainage, utilities, lighting, traffic, right-of-way, aesthetics, and structures. Each meeting resulted in valuable input to complete the respective design.
- Attendance at monthly project meetings with the City of San Francisco, the SFCTA, and TIDA to share information and discuss coordination issues.
- Meeting with SHPO on 7/23/09 to discuss impacts of the relocation of Buildings 10 and 267 and effects of Alternatives 2b and 4 on the historic district.
- Meeting with USCG on 2/9/10 to discuss project impacts to the USCG right-of-way and project responsibilities between Caltrans, TIDA, and SFCTA.
- Meeting with USCG on 3/23/09 to discuss the Hillcrest/South Gate Road intersection configuration and truck turning on Macalla Road.
- Meeting with the U.S. Navy on 5/19/10 to discuss right-of-way.
- Meeting with FHWA on 12/1/09 to provide an update on the project.
- Meeting with the Department of Homeland Security on 1/12/10 to discuss Bridge security.
- Meetings with the Caltrans Seismic PEER Review Panel on 11/21/08, 1/30/09, 4/24/09, and 6/26/09 to discuss the seismic response of the ramps and their impacts to the YBITS 1 project.

- Meetings with the Caltrans Project Management Team on 11/3/08, 1/12/09, and 9/14/09 to discuss project funding and combining the YBI Ramps Improvement Project with the SFOBB.

- Meetings with SFPUC on 1/26/09 and 3/19/09 to discuss potential impacts to utilities. Meeting resulted in positive feedback and information to identify impacted utilities.

- Meeting and site visit with SHPO on 9/24/09 to discuss impacts of the relocation of Buildings 10 and 267.

- If necessary, the appropriate permit applications will be submitted to USACE, CDFG, and RWQCB for temporary project impacts.

- Cultural Resources Consultation of Draft Finding of Effect (FOE) – The following Section 106 process activities and consultations have been conducted in support of this Draft EIR/EIS and preparation of a Draft FOE.

  AECOM sent a contact letter to the Native American Heritage Commission (NAHC) on November 7, 2008, requesting a search of the Sacred Lands File and a list of suitable Native American tribal organizations and individuals that might have an interest in or concerns with the project. AECOM sent contact letters to the NAHC-suggested Ohlone/Costanoan representatives on December 17, 2008, and followed up with phone calls approximately 2 weeks later. No responses were received.

  JRP, on behalf of the SFCTA, sent letters to interested parties on December 11, 2008, to inform area planning agencies, local governments, historical societies, museums, and other interested parties of the proposed project. No responses were received. The following organizations received this letter:

  - San Francisco Architectural Heritage
  - San Francisco Landmark Preservation Advisory Board
  - Preservation Coordinator, San Francisco Planning Department
  - San Francisco History Association
  - San Francisco Museum and Historical Society
  - California Historical Society
  - San Francisco Beautiful
  - California Heritage Council
  - California Preservation Foundation
  - National Trust for Historic Preservation Western Office
  - National Park Service, Pacific West Region Office
  - Oakland Heritage Alliance
  - Oakland Landmarks Preservation Advisory Board
  - Oakland Cultural Heritage Survey
  - Alameda County Historical Society
  - Alameda County Parks, Recreation and Historical Commission

On November 4, 2009, AECOM, on behalf of SFCTA, sent letters to inform interested parties of the findings of historic properties identified within the project's APEs, in compliance with Section 106 of the NHPA and that the FOE report was submitted to SHPO.

Project Website – Information about the proposed project and the environmental review process (including the NOI/NOP) is posted on the SFCTA's website at www.sfcta.org.

5.4 Public Participation on the Draft EIR/EIS

The public review period for this Draft EIR/EIS extends from February 25, 2011 to April 11 , 2011. A public hearing on this document is scheduled for Wednesday, March 16, 2011 and will be held at the Port of San Francisco office, in the Bayside Conference Room located at Pier 1, The Embarcadero, San Francisco, CA 94111 from 6:00 to 8:00 p.m.

A copy of the NOA has been distributed with this Draft EIR/EIS. Comments will be considered and addressed in the Final EIR/EIS.

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CHAPTER 7 – REFERENCES

Advisory Council on Historic Preservation (ACHP)

1980 Treatment of Archeological Properties: A Handbook. Washington, D.C.

AECOM

2007 Yerba Buena Island Ramp Improvements – PEAR.

2009a Archaeological Survey Report, Yerba Buena Islands Ramps Improvement Project. September.

2009b Historic Property Survey Report, Yerba Buena Islands Ramps Improvement Project. September.

2009c Water Quality Report for Yerba Buena Islands Ramps Improvement Project. August 21.

2009d Long Form – Storm Water Data Report. Prepared for SFCTA and Caltrans. June.

2009e Yerba Buena Island Ramps Improvement Project Botanical Assessment.

2010 Preliminary Phase I ISA Report, Yerba Buena Island Ramps Improvement Project, Yerba Buena Island, San Francisco County, California. June 8.

2011a Yerba Buena Ramps Improvement Project, Final Noise Study Report. January.

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CHAPTER 8 – DISTRIBUTION LIST

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APPENDIX A

CEQA CHECKLIST

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CEQA Environmental Checklist

District 4, San Francisco, I-80	Jack Siauw/Eric Cordoba	SFCTA
Dist.-Co.-Rte.	P.M/P.M.	E.A.

This checklist identifies physical, biological, social and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☒	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

V. CULTURAL RESOURCES: Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

VI. GEOLOGY AND SOILS: Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

VII. GREENHOUSE GAS EMISSIONS: Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Caltrans has included this good faith effort in order to provide the public and decision-makers as much information as possible about the project, it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.

VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) 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?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

IX. HYDROLOGY AND WATER QUALITY: Would the project:

a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or 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 (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒

X. LAND USE AND PLANNING: Would the project:

a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

XI. MINERAL RESOURCES: Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

XII. NOISE: Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

XIII. POPULATION AND HOUSING: Would the project:

a) Induce 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)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

XIV. PUBLIC SERVICES:

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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 any of the public services:

Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XV. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project’s solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐