

SUMMARY

Doyle Drive, also known as Route 101, provides southern access to the Golden Gate Bridge, serving residents in Marin and San Francisco Counties and the region as a whole (see **Exhibit S-1**). It also provides limited access to the Presidio of San Francisco (the Presidio). Due to its importance within the regional transportation system, the Federal Highway Administration (FHWA), the California Department of Transportation (Caltrans), and the San Francisco County Transportation Authority¹ (the Authority) propose to improve seismic, structural, and traffic safety along Doyle Drive.

Doyle Drive is located within the Presidio, and it provides access to such cultural and natural features as the Golden Gate National Recreation Area (GGNRA), the Presidio,² the Golden Gate Bridge, and the Palace of Fine Arts.

Exhibit S-1
Regional Context of Doyle Drive



¹ In addition, the National Park Service (NPS), the Presidio Trust (Trust) and the Department of Veterans Affairs (VA), are playing major roles in the development and implementation of this project.

² The Presidio of San Francisco is part of the Golden Gate National Recreation Area.

S.1 Related Plans and Projects

In addition to the proposed South Access to the Golden Gate Bridge - Doyle Drive Project, other plans and projects in the Presidio are also underway. Some of these include: the National Park Service's (NPS's) *General Management Plan Amendment* (GMPA); the Presidio's *Vegetation Management Plan* (VMP); the *Presidio Trails and Bikeways Master Plan*; and the *Presidio Trust Management Plan* (PTMP).



Doyle Drive viaduct structure

S.2 Project Purpose and Need

The purpose of the proposed project is to improve the seismic, structural, and traffic safety of Doyle Drive within the setting and context of the Presidio of San Francisco, and its purpose as a National Park.

- Specific objectives of the Doyle Drive Project, as they relate to the project's purpose, are to improve the seismic, structural and traffic safety on Doyle Drive;
- maintain the functions that the Doyle Drive corridor serves as part of the regional and city transportation network;
- improve the functionality of Doyle Drive as an approach to the Golden Gate Bridge;
- preserve the natural, cultural, scenic and recreational values of affected portions of the Presidio, a national historic landmark district;
- be consistent with the *San Francisco General Plan* and the *General Management Plan Amendment Final Environmental Impact Statement, Presidio of San Francisco, Golden Gate National Recreation Area* (NPS 1994a and 1994b) for Area A of the Presidio and the *Presidio Trust Management Plan: Land Use Policies for Area B of the Presidio of San Francisco* (Presidio Trust 2002);
- minimize the effects of noise and other pollution from the Doyle Drive corridor on natural areas and recreational qualities at Crissy Field and other areas adjacent to the project area;
- minimize the traffic impacts of Doyle Drive on the Presidio and local roadways;
- improve intermodal and vehicular access to the Presidio; and
- redesign the Doyle Drive corridor using the parkway concept described within the *Doyle Drive Intermodal Study* (1996).

Doyle Drive, is approaching the end of its useful life after over 70 years of operation. In the short-term, regular maintenance, seismic retrofit, and rehabilitation activities are keeping the structure safe. However, in the long-term, permanent improvements are needed to bring Doyle Drive up to current design and safety standards. **Exhibit S-2** summarizes the need for the project.

**Exhibit S-2
Need for this Project**

ELEMENT	DEFICIENCY	RESULT
STRUCTURE	<ul style="list-style-type: none"> ▪ Age of the facility ▪ The effects of heavy traffic ▪ Exposure to salt air 	Seismically and structurally unsafe
LOCATION	Eastern portion is located in an identified liquefaction ¹ zone	Potential structural failure during an earthquake
DESIGN	Original design does not meet today's safety standards	Today's vehicle fleet combined with traffic volumes contributes to driving patterns not anticipated when Doyle Drive was designed
ACCESS	No direct vehicular access into the Presidio	Limited access to facilities within the Presidio

¹Liquefaction is the process by which a solid behaves as a liquid. This is often the case with some soils, resulting in landslides. Liquefaction can also happen during an earthquake in certain filled areas.

S.3 Project Partners

A number of agencies are participating in this Doyle Drive environmental process. These agencies and their roles are discussed below.

Federal Lead Agency

A *National Environmental Policy Act* (NEPA) document is required for most federal actions. An action can include funding a project, building a project on federal land, or issuing a federal permit. The federal agency which 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 Doyle Drive Project, FHWA is the lead federal agency for the purposes of NEPA. The Authority and Caltrans are also co-lead agencies on this project.

State Lead Agency

Similar to NEPA regulations, the *California Environmental Quality Act* (CEQA) requires that an agency take responsibility for complying with state

environmental regulations. The lead CEQA agency for the Doyle Drive Project is the Authority.

CEQA Responsible Agencies

Under CEQA, a Responsible Agency reviews the environmental document and is responsible for considering the environmental effects that would be caused by the activity which the agency is called upon to approve. For this project, Caltrans, the Golden Gate Bridge, Highway and Transportation District and the City and County of San Francisco are the CEQA Responsible Agencies. Caltrans is also the owner and operator of Doyle Drive.

NEPA Cooperating Agencies

Upon request of the lead agency, any other federal agency which has jurisdiction within the project area, or which has special expertise with respect to any environmental issue, may be a cooperating agency. The three cooperating agencies for the Doyle Drive Project are the:

- Presidio Trust;
- United States Department of the Interior, National Park Service (NPS) - Golden Gate National Recreation Area; and
- United States Department of Veteran Affairs (VA).

To satisfy both NEPA and CEQA requirements, the lead agencies with input from the cooperating and responsible agencies, have developed this combined NEPA/CEQA document for the South Access to the Golden Gate Bridge - Doyle Drive Project.

S.4 Alternatives Considered

The project team met with elected officials, planning and engineering staff, and community residents to discuss potential project alternatives and access options. Scoping meetings, open houses, and small community meetings³ were conducted in early 2000. As a result of these meetings, screening criteria were developed to help evaluate alternatives and access options.

The alternatives development process (including access options) followed an approach that was sensitive and responsive to community members, resource agencies, and local agency staff.

Preliminary Alternatives

The preliminary set of alternatives and access options ranged from little or no improvements to the roadway, to emphasizing transit improvements (such as

³ Chapter 6 of this document presents the public, agency, and Native American Tribal involvement process for this environmental analysis.

high-occupancy vehicle (HOV) lanes),⁴ to rehabilitating or replacing the existing structures, to new facilities in a different location. Because Doyle Drive currently has limited vehicular access into the Presidio, additional access options were also identified and evaluated.

Preliminary alternatives were developed based on four general design and/or location concepts. These concepts were:

- do nothing (which means the project would not be implemented, only bi-annual inspections, regular maintenance and interim repairs would occur
- rehabilitate the existing structure;
- build a new facility in a new location; and
- rebuild a facility in the same corridor (In Corridor Concept).

The In Corridor Concept was divided into four vertical alignments alternatives: elevated, tunnel, at-grade, and depressed. The project team recognized that rebuilding the facility would have a major impact on traffic circulation during construction. As such, two construction options for each of the four rebuild alternatives were evaluated. These construction options were to either detour Doyle Drive traffic on a temporary detour structure during construction, or phase construction to ensure that existing traffic be maintained within the corridor.

Additional Preliminary Alternatives

Two other preliminary build alternatives were introduced by the project team:

- The Couplet Alternative was developed during the alternative refinement process to maximize views of the Palace of Fine Arts and the Golden Gate Bridge from the roadway, and to enhance pedestrian accessibility by separating southbound and northbound traffic.
- The Presidio Parkway concept was introduced in January 2003 to provide an alternative closer to the Parkway concept developed as part of the Doyle Drive Task Force (1993). The alternative introduces wide landscaped medians to emphasize the park-like setting and uses two shallow tunnels to improve access across the Doyle Drive corridor. Halleck Street is raised over the tunnel portal to allow a low level causeway to pass over the Presidio's area of possible marsh expansion.

For each of these concepts, access to the Presidio was to be provided via signalized intersections at an extension of Girard Road to Marina Boulevard. The Parkway Alternative also has several options, including two east-end

⁴ High-occupancy vehicle (HOV) lanes on a replacement facility were considered prior to assembling the list of initial alternatives. They were eliminated from further consideration because there is no existing plan to provide a system of HOV lanes on the connecting roadway network, and there would be physical constraints on the eastern and western approaches of Doyle Drive. Without a larger network to tie into, a Doyle Drive HOV lane would have limited effectiveness in terms of travel time savings.

Presidio access options, two Park Presidio Interchange options, and a slip ramp to Merchant Road.

Alternatives for Further Study

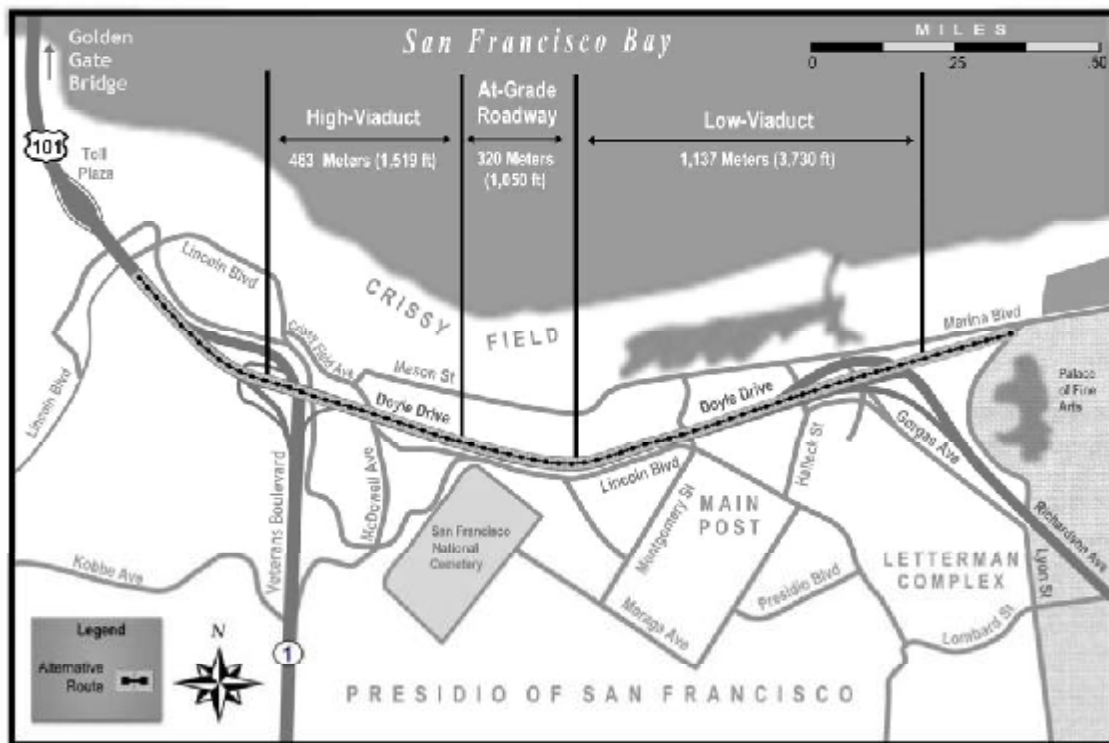
Typically in an environmental analysis, two types of alternatives are analyzed – build alternatives (can range from one alternative to many alternatives) and a No-Build Alternative which means the project would not be built and the facility would remain as is. Bi-annual inspections, regular maintenance and interim repairs would occur. A No-Build Alternative represents the baseline. All other alternatives are compared to the No-Build. In the *Draft Environmental Impact Statement/Report* (DEIS/R), the alternatives which moved forward for further study included the No-Build Alternative and two build alternatives. Alternatives were selected based on the purpose and need for this project – mainly to increase safety along Doyle Drive.

No-Build Alternative

The No-Build Alternative represents the future year conditions if no other actions are taken in the study area beyond what is already programmed by the year 2020. It is the baseline condition against which all other alternatives are compared. Doyle Drive would remain in its current configuration (i.e., “No-Build”): 2.4 kilometers (1.5 miles) long with six traffic lanes ranging in width from 2.9 to 3 meters (9.5 to 10 feet) wide. There are no fixed median barriers or shoulders currently existing on Doyle Drive. The roadway passes through the Presidio on one high steel truss and one low elevated concrete viaduct with lengths of 463 meters (1,519 feet) and 1,137 meters (3,730 feet), respectively. The height of the high-viaduct ranges from 20 to 35 meters (66 to 115 feet) above the ground surface. The low-viaduct has an average height of approximately 8 to 10 meters (26 to 33 feet). This alternative considers those operational and safety improvements that have been planned and programmed to be implemented by the year 2020. This alternative is required of all federal and state planning guidelines. The No-Build Alternative does not improve the seismic, structural, and traffic safety of the roadway.

The seismic retrofit of the high-viaduct that was completed in 1997 was performed presuming Doyle Drive would be replaced within ten years and did not address the issue of the deteriorated bridge decks that have reached the end of their useful life. Under the No-Build Alternative, interim repairs would be required to maintain operations on the high-viaduct. The high-viaduct is currently undergoing a rehabilitation that includes removal of existing paint, removal and replacement of in-kind various steel elements and connection rivets, replacement of deck joint seals, and repainting. These interim repairs are expected to maintain the current level of safety and do not constitute a retrofit or a full rehabilitation. This interim rehabilitation which was programmed for Fiscal Year (FY) 2005/6 started in September 2006 and is anticipated to be completed in November 2009.

Exhibit S-3
Alternative 1: No-Build



It is expected that on-going maintenance would then be required to maintain the service load carrying capacity and safety of the facility to prevent it from being designated with a weight restriction. If the high-viaduct is designated with a weight restriction, buses and trucks will have to take alternate routes. **Exhibit S-3** presents the general location and configuration of this alternative. However, it should be noted that the rehabilitation can only be considered a short-term solution merely delaying the eventual need for replacement of the entire high-viaduct structure.

The low-viaduct is unique in that the latest seismic retrofit completed in 1997 was installed with the condition that the bridge would be replaced within five to ten years because the seismic capacity of the bridge is limited. Limitations on capacity were imposed by the make-up of the structure, namely its type, materials, and its current state of deterioration. According to the State's risk analysis performed in 1998 (*Risk Assessment of Marina Viaduct*, Caltrans 1998), the latest seismic retrofit provides seismic capacity for an earthquake that has a five percent chance of being exceeded between the years of 1998 and 2008 and a 2.5 percent chance of being exceeded between the years of 1998 and 2003. It is expected that like the high-viaduct, interim repairs are likely to be made when recommended, at a minimum, by the biennial maintenance inspections.

Vehicular access to the Presidio is available from Doyle Drive via the on- and off-ramps to Merchant Road at the Golden Gate Bridge Toll Plaza. This area is at the far western end of the Presidio, away from the developed area of the park. At the eastern end of Doyle Drive, Presidio access is provided for southbound traffic via a right turn from Richardson Avenue to Gorgas Avenue. Presidio access for northbound traffic is provided by the slip ramp from northbound Richardson Avenue to Gorgas Avenue.

Alternative 1 also includes programmed projects which are identified in the Metropolitan Transportation Commission's Regional Transportation Plan, 2005.

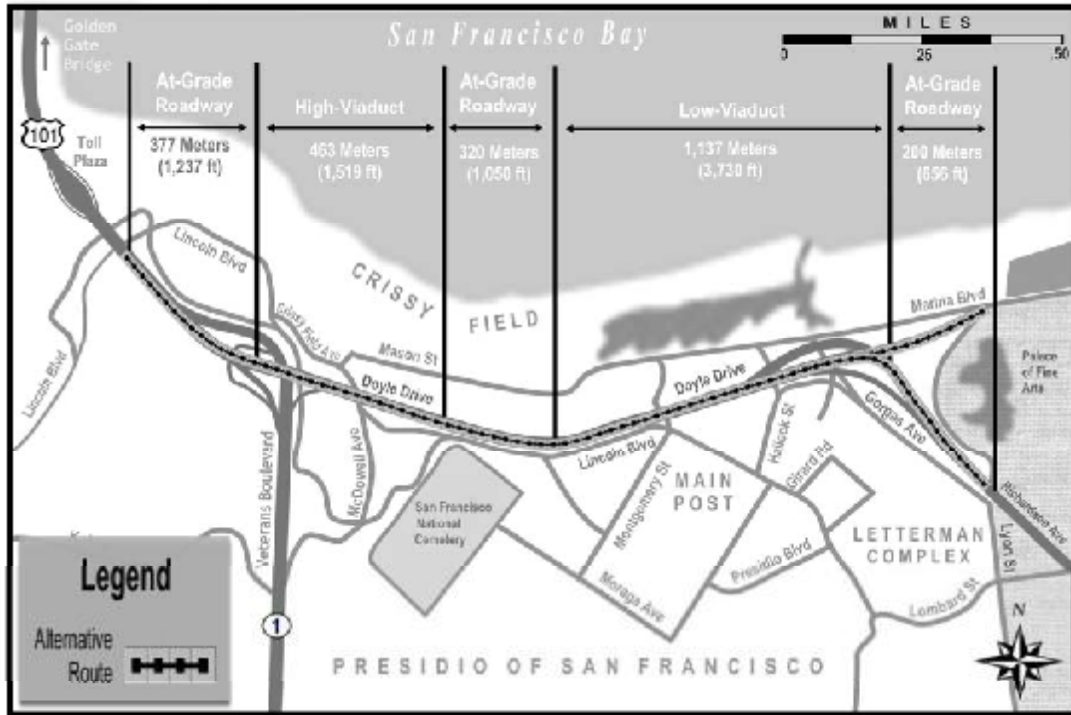
Alternative 2: Replace and Widen Alternative

The Replace and Widen Alternative would replace the 463-meter (1,519-foot) long high-viaduct and the 1,137-meter (3,730-foot) long low-viaduct with wider structures that meet the most current seismic and structural design standards. **Exhibit S-4** (on the following page) presents the general location and configuration of this Replace and Widen Alternative. The height of the high-viaduct would vary from 20 to 35 meters (66 to 115 feet) above the ground surface. The low-viaduct would have an average height of approximately 8 to 10 meters (26 to 33 feet). The new facility would be placed on the existing alignment and widened to incorporate improvements for increased traffic safety.

This alternative would include three 3.6-meter (12-foot) lanes in each direction with three-meter (ten-foot) outside and inside shoulders. In addition, the facility would include a 3.6-meter (12-foot) auxiliary lane in the southbound direction from the Park Presidio Interchange to the Richardson Avenue ramp. The new facility would have an overall width of 37.8 meters (124 feet). The new facility would require a localized northbound lane width reduction to 3.3 meters (11 feet), and inside shoulder reduction to 0.6 meters (two feet) to avoid impacts to the historic batteries which are the remnants of the original Presidio coastal gun emplacements and Lincoln Boulevard, reducing the facility width to 32.4 meters (106 feet). This alternative would not preclude Golden Gate Bridge, Highway and Transportation District's (GGBHTD's) parking of the moveable median barrier machine in the median of Doyle Drive south of the Toll Plaza.

Vehicular access to the Presidio would be available from Doyle Drive via the on- and off-ramps to Merchant Road at the Golden Gate Bridge Toll Plaza. Access to Lincoln Boulevard and the Presidio from Merchant Road is via roads that service GGBHTD facilities such as its maintenance and administration buildings and visitor areas. Presidio access at the east end of the project would be provided for southbound traffic via a right turn from Richardson Avenue to Gorgas Avenue. The current Presidio access for northbound traffic at the east end of Doyle Drive cannot be accommodated due to geometric constraints and concerns for traffic safety. Retaining walls would be required at the Park Presidio Interchange to accommodate the ramp realignments. A retaining wall would also be constructed on the south side of the facility along the constrained section between the National Cemetery and the historic batteries.

Exhibit S-4
Alternative 2: Replace and Widen



The Replace and Widen Alternative includes two options for the construction staging:

- **No-Detour Option** – The widened portion of the new facility would be constructed on both sides and above the existing low-viaduct and would maintain traffic on the existing structure. Traffic would be incrementally shifted to the new facility as it is widened over the top of the existing structure. Once all traffic is on the new structure, the existing structure would be demolished and the new portions of the facility would be connected. To allow for the construction staging using the existing facility, the new low-viaduct would be constructed two meters (seven feet) higher than the existing low-viaduct structure.
- **With Detour Option** - A 20.4-meter (67 foot) wide temporary detour facility would be constructed to the north of existing Doyle Drive to maintain traffic through the construction period. Access to Marina Boulevard during construction would be maintained on an elevated temporary structure south of Mason Street. On- and off-ramps for the mainline detour facility would connect to existing Marina Boulevard/Lyon Street intersection.

Alternative 5: Presidio Parkway Alternative

The Presidio Parkway Alternative would replace the existing facility with a new six-lane facility and a southbound auxiliary lane, between the Park Presidio Interchange and the new Presidio access at Girard Road. **Exhibit S-5** (on the following page) presents the general location and configuration of this alternative. The new facility would consist of two 3.3-meter (11-foot) lanes and one 3.6-meter (12-foot) outside lane in each direction with 3.0-meter (10 feet) outside shoulders and 1.2-meter (4 feet) inside shoulders. In addition, a 3.3-meter (11-foot) auxiliary lane runs along southbound Doyle Drive from the Park Presidio Interchange to the Girard Road exit ramp. The total roadway width would be 32.1 meters (105.3 feet) and the overall facility width including the median would vary from 37.1 to 44.6 meters (121.7 to 146.3 feet). The width of the proposed landscaped median varies from five meters (16 feet) to 12.5 meters (41 feet). This alternative would not preclude GGBHTD's parking of the moveable median barrier machine in the median of Doyle Drive south of the Toll Plaza.

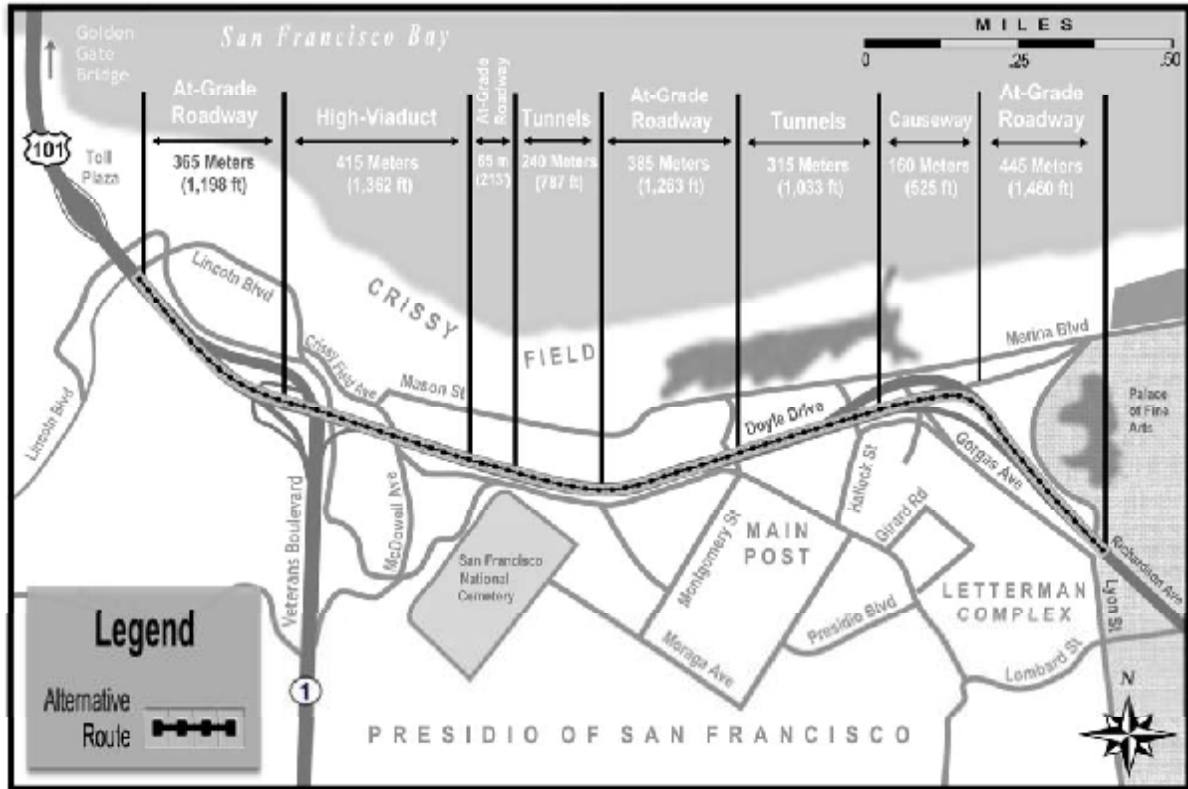
Based on the realignment of Doyle Drive, the Park Presidio Interchange would be reconfigured. The exit ramp from southbound Doyle Drive to southbound Veterans Boulevard would be replaced with standard exit ramp geometry and widened to two lanes. The loop of the northbound Doyle Drive exit ramp to southbound Veterans Boulevard would be improved to provide standard exit ramp geometry. The northbound Veterans Boulevard connection to northbound Doyle Drive would be realigned to provide standard entrance ramp geometry. There are two options for the northbound Veterans Boulevard ramp to a southbound Doyle Drive connection:

- **Loop Ramp Option** - Replace the existing ramp with a loop ramp to the left to reduce construction close to the Cavalry Stables and provide standard entrance and exit ramp geometry.
- **Hook Ramp Option** - Rebuild the ramp with a similar configuration as the existing directional ramp with a curve to the right and improved exit and entrance geometry.

To minimize impacts to the park, the footprint of the new facility would include a large portion of the existing facility's footprint east of the Park Presidio Interchange. The Presidio Parkway Alternative includes two options for direct access to the Presidio and Marina Boulevard at the eastern end of the project:

- **Diamond Option** – Direct access to the Presidio and indirect access to Marina Boulevard in both directions is provided by the access ramps from Doyle Drive connecting to a grade-separated interchange at Girard Road. East of the new Letterman garage, Gorgas Avenue is a one-way street and connects to Richardson Avenue with access to Palace Drive via a signalized intersection at Lyon Street. Palace Drive would operate as a one-way road and would be separated from Lyon Street.

Exhibit S-5
Alternative 5: Presidio Parkway



- Circle Drive Option** –Direct access to the Presidio and indirect access to Marina Boulevard for southbound traffic by access ramps connecting to a grade-separated interchange of Girard Road. Northbound traffic from Richardson Avenue would access the Presidio through a jug handle intersection with Gorgas Avenue. Palace Drive would operate as a one-way road and would be separated from Lyon Street.

Included in both the Diamond and Circle Drive options are extended bus bays on both sides of Richardson Avenue which would accommodate up to four buses each and improved crosswalks to provide safer and enhanced pedestrian circulation in the area. The extended bus bays would keep the buses out of the main flow of traffic during stops, provide safer merging capability for the buses, and would facilitate transfers between Golden Gate Transit, Muni and PresidiGo vehicles.

At the intersection of Doyle Drive and Merchant Road, just east of the Toll Plaza, a design option has been developed for a Merchant Road Slip Ramp. This option would provide an additional new connection from northbound Doyle Drive to Merchant Road. This ramp would provide direct access to the Golden

Gate Visitors' Center as well as the Presidio and alleviate the congested weaving section where northbound Veterans Boulevard merges into Doyle Drive.

Retaining walls would be required at the Park Presidio Interchange to accommodate the reconstruction of the ramps. A retaining wall up to eight meters (26 feet) would be constructed along the south side of the facility between the Battery and Main Post tunnels. Retaining walls would also be required in the eastern end of the alignment primarily along the extended Girard Road. Fences would be required along the edge of the at-grade portions of the roadway to restrict pedestrian access.

Identification of the Preferred Alternative

Following release of the DEIS/R in December 2005, individuals and agency staff provided almost eight hundred comments regarding the environmental analysis and project alternatives. Based on these comments and agency/public workshops, it was determined that Alternative 5: Presidio Parkway, would best meet the purpose and need of this Doyle Drive project, if certain modifications to the proposed design were made.

In response to these comments, and to address traffic circulation, tidal inundation issues, the elimination of the underground parking below Doyle Drive, and the provision of additional surface parking to more closely match existing conditions, refinements were made to the Presidio Parkway Alternative.

The Doyle Drive Subcommittee to the Citizens' Advisory Committee (CAC), the Doyle Drive Executive Committee comprised of lead, cooperating and responsible agencies and the Authority CAC all held meetings in July 2006 to consider recommendations for a preferred alternative and design options. All three groups made identical recommendations for selection of the Presidio Parkway and design options.

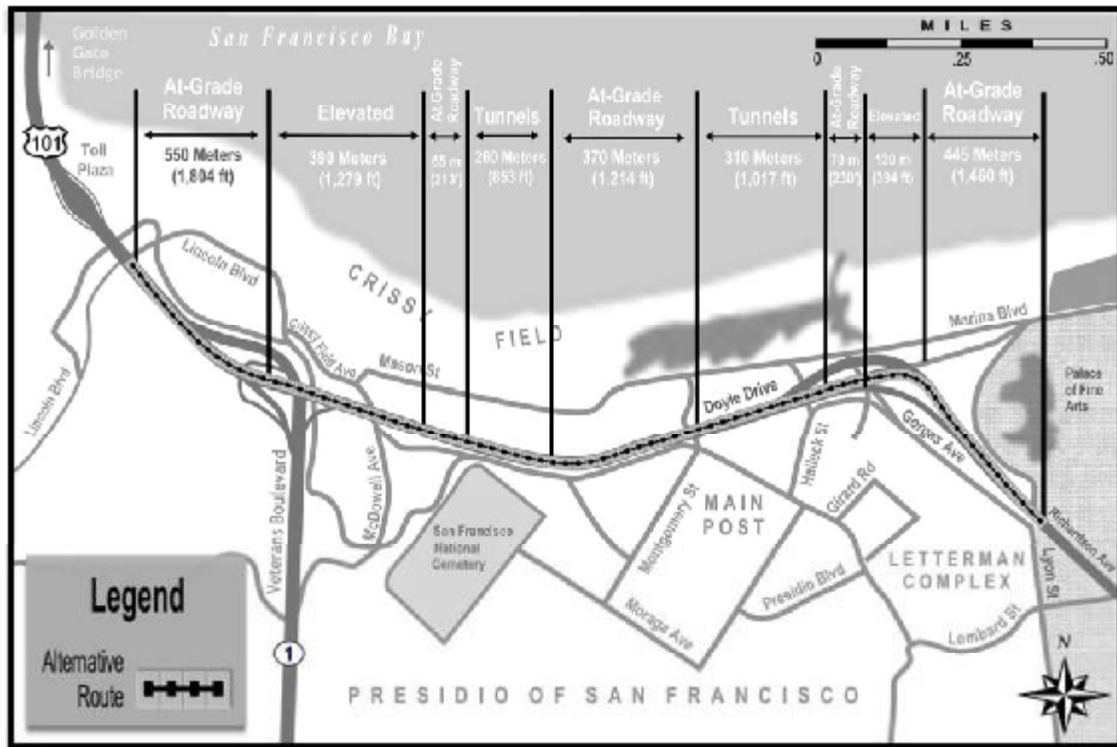
The recommendations were: Alternative 5, Presidio Parkway, with specific design elements including the modified Hook Ramp Option for the Presidio Parkway Interchange and the Diamond Option for Presidio Access. The groups did not support including the Merchant Road Slip Ramp Option.

Preferred Alternative: Refined Presidio Parkway

The Refined Presidio Parkway Alternative, shown in **Exhibit S-6** (on the following page) will replace the existing facility with a new six-lane facility and a southbound auxiliary lane, between the Park Presidio Interchange and the new Presidio access at Girard Road.

The new facility will consist of two 3.3-meter (11 foot) lanes and one 3.6-meter (12 foot) outside lane in each direction with three meter (10 feet) outside shoulders and 1.2-meter (four-foot) inside shoulders. The southbound direction will include a 3.3-meter (11 foot) auxiliary lane from the Park Presidio Interchange to the Girard Road exit ramp. The total roadway width will be 32.1 meters (105.3 feet) and the overall facility width including the median will vary

Exhibit S-6
Preferred Alternative: Refined Presidio Parkway



from 37.1 to 44.6 meters (121.7 to 146.3 feet). The width of the proposed landscaped median will vary from five meters (16 feet) to 12.5 meters (41 feet). To minimize impacts to the park, the footprint of the new facility will overlap with a large portion of the existing facility's footprint east of the Park Presidio Interchange. This alternative will not preclude GGBHTD's parking of the moveable median barrier machine in the median of Doyle Drive south of the Toll Plaza.

A 390-meter (1,279-foot) long high-viaduct will be constructed between the Park Presidio Interchange and the San Francisco National Cemetery. The height of the high-viaduct will vary from 20 to 35 meters (66 to 115 feet) above the ground surface. Shallow cut-and-cover tunnels will extend 260 meters (853 feet) past the cemetery to east of Battery Blaney. The facility will then continue towards the Main Post in an open at-grade roadway with a wide heavily landscaped median. A retaining wall between 4 to 8 meters (13 to 26 feet) high will be constructed along the south side of the facility between the Battery and Main Post tunnels. A landscaped berm will be constructed along the north side of the facility to shield park visitors from the proposed facility.

From Building 106 (Band Barracks) cut-and-cover tunnels up to 310 meters long (1,017 feet) will extend to east of Halleck Street. The amount of fill over the

tunnels is being coordinated with the Trust based on requirements of the *Vegetation Management Plan*. The expected minimum depth to support native vegetation is two meters (six feet). The facility will then rise slightly on a low causeway 120 meters (394 feet) long over the site of the proposed Tennessee Hollow restoration and then pass over a depressed Girard Road. The low causeway will rise to approximately three meters (ten feet) above the surrounding ground surface at its highest point. East of Girard Road the facility will return to existing grade north of the Gorgas warehouses and connect to Richardson Avenue. The proposed facility will provide a transition zone starting from the Main Post tunnel to reduce vehicle speeds prior to entering city streets. A motor control and switch gear room to operate the tunnel life-safety equipment will be integrated with the Main Post tunnels.

The Park Presidio Interchange will be reconfigured due to the realignment of Doyle Drive to the south. The exit ramp from southbound Doyle Drive to southbound Veterans Boulevard will be replaced with standard exit ramp geometry and widened to two lanes. The loop of the northbound Doyle Drive exit ramp to southbound Veterans Boulevard will be improved to provide standard exit ramp geometry. The northbound Veterans Boulevard connection to northbound Doyle Drive will be realigned to provide standard entrance ramp geometry. The northbound Veterans Boulevard connection to southbound Doyle Drive will be reconstructed in a similar configuration as the existing directional ramp with improved sight lines, exit, and entrance geometry.

The Preferred Alternative will provide direct access to the Presidio and indirect access to Marina Boulevard in both directions via access ramps from Doyle Drive connecting to an extension of Girard Road. East of the new Letterman garage, Gorgas Avenue is a one-way street with a signalized intersection at Richardson Avenue. North of Richardson Avenue, Lyon Street will remain in its existing configuration that provides access to Palace Drive. The surface parking spaces will be reconfigured to maintain the existing parking supply in the area and improve pedestrian access between the Presidio and the Palace of Fine Arts.

Retaining walls will be required at the Park Presidio Interchange to accommodate the reconstruction of the ramps. Retaining walls will also be required in the eastern end of the alignment primarily along the extended Girard Road. Fences will be required along the edge of the at-grade portions of the roadway to restrict pedestrian access onto the roadway.

S.5 Project Costs

The estimated construction costs for each of the alternatives have been developed and are shown in **Exhibit S-7**. These costs are based on 2008 unit prices and are escalated at the following rates to represent year of expenditure costs: 2007-2008 at five percent per year, 2008-2010 at four percent per year, and 2010-2014 at 3.3 percent per year. These cost estimates are conceptual and are based on information that was available during the preparation of this environmental document. Estimates were developed from information obtained in 2007 based on the preliminary alignments, existing utilities, historic construction costs, and quotations from various local suppliers and contractors. These estimates range from zero for Alternative 1 – No-Build to approximately \$1.1 billion for Alternative 5 (estimates in year of expenditure dollars). The total construction cost for the Preferred Alternative is approximately \$853 million.

Exhibit S-7
Estimated Construction Cost of Project Alternatives
 (in year of expenditure dollars)

ALTERNATIVE	OPTION	ROADWAY	STRUCTURES	CONSTRUCTION TOTAL		
1	NO-BUILD	—	\$0	\$0		
2	REPLACE AND WIDEN	No-Detour	\$130,300,000	\$657,800,000	\$788,100,000	
		With Detour	\$140,00,000	\$702,100,000	\$842,100,000	
5	PRESIDIO PARKWAY	Diamond	Loop Ramp	\$298,800,000	\$805,500,000	\$1,104,300,000
			Hook Ramp	\$297,300,000	\$782,000,000	\$1,079,300,000
	Circle	Loop Ramp	\$299,100,000	\$805,500,000	\$1,104,600,000	
		Hook Ramp	\$297,500,000	\$782,000,000	\$1,079,500,000	
		Merchant Ramp	\$16,100,000	\$1,300,000	\$17,400,000	
PREFERRED			\$281,100,000	\$571,500,000	\$852,600,000	

Source: Parsons Brinckerhoff, 2008

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (Pub. L. 109-59, 119 Stat. 1144) requires the financial plan for all Federal-aid projects with an estimated total cost of \$500 million or more to be approved by the Secretary (i.e. FHWA) based on reasonable assumptions. The \$500 million threshold includes capital outlay support costs and design services. FHWA has interpreted reasonable assumptions to be a risk based analysis. These cost estimate reviews are required to provide the risk based assessment of the estimate and are used in the approval of the financial plan.

In March 2008, the FHWA conducted a cost estimate review of the Preferred Alternative to verify the accuracy and reasonableness of the current total cost estimate to complete the project and to develop a probability range for the cost estimate that represents the project's stage of design. The FHWA worked with the Project team to review the material quantities and unit costs and develop the expected variance for each. The FHWA input the expected variance into a Monte Carlo⁵ simulation to develop forecast curves that represent a cost estimate range for the project.

The Project team met with the FHWA in April 2008 and May 2008 to determine the confidence level of the cost estimate range based on the project's current stage of development. Based on those discussions, the FHWA performed a Monte Carlo simulation which resulted in total project cost estimate range of \$1.02 to \$ 1.14 billion. This agreed that a 70 percent confidence level was the appropriate funding level for the Project and validated the Project team's total project cost of \$1.045 billion.

S.6 Summary of Permanent Impacts

Potential permanent impacts resulting from each alternative are summarized in **Exhibits S-9** through **S-11** (located at the end of this Summary). Temporary impacts as well as proposed avoidance, minimization, and mitigation are discussed in **Chapter 3** of this document.

S.7 Potential Permits

Based on the analyses and findings of this environmental document, necessary permits and approvals have been identified. Coordination, consultation, and preparation of permit documents will be initiated by the project proponent. **Exhibit S-8** identifies the necessary permits, reviews, and approvals.

In addition, an agreement to obtain right of way from the Presidio Trust to build the proposed facility will be necessary. Currently, no agreement has been drafted. An agreement between the City and County of San Francisco (CCSF) and Caltrans will also be necessary since the proposed project will overlap into CCSF streets, which will require modifications to existing traffic signals. A *Programmatic Agreement* (PA) between the Federal Highway Administration, the National Park Service, the Presidio Trust, the Veterans Administration, the San Francisco County Transportation Authority, Caltrans, Advisory Council on Historic Preservation, California State Historic Preservation Officer, and San Francisco Recreation and Parks Department has been developed. The document records the terms and conditions agreed upon to resolve the adverse effects of the project upon the National Historic Landmark.

⁵ A Monte Carlo simulation calculates multiple scenarios of the outcome by continually sampling random values from the expected variance. The simulations ran by FHWA consisted of 10,000 iterations.

**Exhibit S-8
Project Permits, Reviews and Approvals**

AGENCY	PERMIT/APPROVAL	STATUS
United States Army Corps of Engineers	Section 404 Clean Water Act/ Nationwide Permit	New wetland delineation completed in May 2007. Wetland mitigation planning begun (see <i>Wetland Restoration and Enhancement Mitigation Plan</i> in Appendix K).
United States Fish and Wildlife Service	Endangered Species Act Section 7 Consultation	Caltrans made a "no effect" determination and that formal consultation with USFWS is not necessary
State Historic Preservation Office	Section 106 National Historic Preservation Act Compliance	Programmatic Agreement has been approved by FHWA and is being circulated for signatory party signatures.
California/Regional Water Quality Control Board (RWQCB)	The RWQCB must certify that a Corps Section 404 Nationwide permit action meets state water quality objectives by issuing a Water Quality Certification. The RWQCB regulates waters of the state that are not within federal jurisdiction. For these areas Waste Discharge Requirements must be identified and a WDR permit obtained.	Ongoing coordination regarding water treatment. Ongoing coordination regarding water treatment.
California State Water Resources Control Board (SWRCB)	Notice of Intent and Storm Water Pollution Prevention Program (SWPPP)	DEIS/R was sent to SWRCB. Further consultation will occur during final design.
San Francisco Bay Conservation and Development Commission (BCDC)	BCDC Negative Determination	BCDC determination will be issued following the release of the FEIS/R.
San Francisco Public Utilities Commission (SFPUC)	The SFPUC must be consulted and approve any project-related discharges to the regional sanitary sewer system. Batch discharge permit	Ongoing coordination regarding water treatment options. Ongoing coordination regarding water treatment options.
Presidio Trust Utilities Department	The Presidio Trust must be consulted and approve any project-related discharges to the local sanitary sewer system. The Presidio Trust Utilities Department must approve all relocations of Trust owned utilities	Ongoing coordination regarding water treatment options. Prior to construction the appropriate approvals will be obtained
Presidio Trust Permitting Department	Contractor must obtain a Dig Permit for any work causing ground disturbance The Contractor must obtain a hot work permit for any cutting, welding, or heat gun work (no open flame torch will be allowed)	Prior to construction the appropriate approvals will be obtained Prior to construction the appropriate approvals will be obtained
Bay Area Air Quality Management District	Naturally-Occurring Asbestos Dust Mitigation Plan (Airborne Toxic Control Measure For Construction And Grading Operations § 93105, Title 17, California Code of Regulations)	Not completed. Should be prepared and submitted to BAAQMD during development of 100 percent construction plans. BAAQMD must also be notified at least 14 days prior to construction activities.
Bay Area Air Quality Management District	Demolition and Renovation Notification (BAAQMD Regulation 11, Rule 2)	Not completed. Must be submitted at least ten working days prior to any non-emergency building demolition or renovation required by the project. Notification is required for any demolition and for each renovation where the amount of Regulated Asbestos-Containing Material (RACM) is greater than or equal to 100 square/linear feet, or for any dry RACM removal. Asbestos surveys should be completed prior to notification submission.

Note: Management and disposal of excavated soil and groundwater during construction could potentially require additional permits, reviews, and/or approvals by regulatory agencies. These requirements will be determined based on the findings of soil and groundwater investigations which will begin in November 2008 and are expected to be complete in Summer 2009.

S.8 Mitigation

Avoidance, minimization and mitigation measures have been identified for this project. The construction of a new Doyle Drive will require the acquisition of various buildings, including several historic buildings, in order to implement the project. These acquisitions will require several businesses to relocate their operations. **Appendix J** provides a general overview of the relocation services provided by Caltrans. In addition to relocation, a summary of mitigation measures and commitments related to the construction and implementation of this project is presented in **Appendix K**.

S.9 Project Commitments

The Doyle Drive project team has strived to create a project that:

- minimizes impacts;
- respects the environment of the National Park, National Historic Landmark District and surrounding neighborhoods;
- meets community needs; and
- provides a safer roadway.

As summarized in **Chapter 6**, the project team has undertaken an extensive public and agency outreach process that included multiple scoping, design and informational workshops and meetings. Input received from the public and agencies has been integral in the development of the Doyle Drive Project.

During the development of the preliminary alternatives, the project team followed a context sensitive approach that integrated Doyle Drive into its setting in a sensitive manner while working to meet the needs of the users, neighboring communities and the environment. The project team will continue to work on context sensitive design elements to improve how the Preferred Alternative fits into the surrounding environment and meets the goals of the project within the context of the National Park setting and the natural environment.

In addition to a context sensitive approach, the project incorporates a sustainable design strategy. Sustainable design is a systems approach to design and construction of a facility that ensures consideration of ecological and human needs in light of well-grounded acceptable engineering and economic constraints. As part of the development of a sustainable design policy for the Preferred Alternative, there is a commitment to developing detailed implementation mechanisms which will measure the project's success or failure at meeting design goals. **Chapter 2** provides a detailed description of both the practice of context sensitive design and sustainable design as they relate to the Doyle Drive Project.

The limited number of impacts associated with the Preferred Alternative is a direct result of the project team continually working to provide the best possible design using the techniques of context sensitive design and sustainability in

addition to being responsive to the concerns and ideas put forth from by the public, agencies and project stakeholders. The collaborative effort has led to the implementation of many project features which help minimize the impact of the Preferred Alternative while meeting the goals of the project. Specific refinements made to the Preferred Alternative are described in **Chapter 2**.

As the Doyle Drive Project moves forward, the project team is committed to continual refinement of the Preferred Alternative. The project team commits to working with the Presidio land managers to ensure:

- the most feasible solution for accommodating the ongoing efforts of the Presidio Trust to daylight and restore the Tennessee Hollow watershed and its connection to Crissy Marsh has been identified;
- any other project concerns are addressed; and
- that all project impacts are successfully mitigated based on the binding mitigation measures presented in this document.

Further detail of the project commitments and mitigation measures to be implemented is provided in **Appendix K**.

S.10 Summary of Public and Agency Comments

During the formal comment period of the DEIS/R, a total of 808 comments were received from the public. A total of 335 of these comments addressed the project alternatives, while 100 comments focused on traffic issues. The remaining comments addressed a wide variety of topics. Of these topics, the major categories on which the public and agencies commented included:

- biological resources;
- noise;
- air quality;
- traffic;
- stormwater;
- cultural resources; and
- selection of the Preferred Alternative.

Issues that the public and agencies stated were ongoing and that needed resolution included:

- treatment of roadway surface water runoff and proposed connection to SFPUC system;
- continuing concerns regarding shading and coordination with marsh restoration;
- agreement on right of way interests with the Presidio Trust; and
- identification of cultural mitigation through the MOA and the assessment of any additional impacts of the mitigation measures.

Since the end of the formal comment period on March 31, 2006, additional input was received at project workshops and through other media. Some of the issues commented on during this time included:

- clarification of the connection to Marina Boulevard;
- continued concerns regarding potential new traffic patterns;
- configuration of the southbound exit ramp to Girard Road; and
- recommendations for the preservation of historic resources.

The project team will continue to gather input from interested parties and address concerns as appropriate within the framework of the environmental process.

S.11 Next Steps

Once this *Final Environmental Impact Statement/Report* (FEIS/R) has been completed, the sponsor agencies will follow the typical NEPA/CEQA procedures. Under NEPA a *Notice of Availability* will be published in the Federal Register and the document will be distributed to all federal, state, and local agencies and private organizations, and members of the public who provided substantive comments on the Draft EIS/R or who requested a copy (40 CFR 1502.19). Typically, pursuant to 23 CFR 771.127, following release of the FEIS/R, FHWA can:

“...complete and sign a *Record of Decision* (ROD) no sooner than thirty days after publication of the FEIS notice in the Federal Register.... Until the ROD has been signed, no further approvals may be given except for administrative activities taken to secure further project funding....

If [FHWA] subsequently wished to approve an alternative which was not identified as the preferred alternative but was fully evaluated in the FEIS, or proposes to make substantial changes to the mitigation measures or findings discussed in the ROD, a revised ROD shall be subject to review by those [FHWA] offices which reviewed the FEIS.”

The ROD is the document which explains the reasons for the project decision, summarizes the mitigation measures to be incorporated and documents any required *Section 4(f)* approvals.

Under CEQA procedures, the State lead agency (the Authority) will approve the project and include a statement of overriding consideration in the record of project approval. The statement of overriding consideration is necessary for projects which will result in unavoidable significant effects as identified in the FEIS/R and it will state the specific reasons as to why the agency supports its decision. Within five days after approval of the project, the lead agency will file a *Notice of Determination* (NOD) with the county clerk. The NOD will be available for public inspection for at least 30 days. Following the project approval process the sponsor agencies will move forward with final design and permitting.

In addition, both CEQA and NEPA regulations require an enforceable mitigation monitoring program be developed for the project. Per CEQA Guidelines 15907(a), "In order to ensure that the mitigation measures and project revisions identified in the EIR are implemented, the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects." Under NEPA regulations, "A monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation" (Section 1505.2(c)).

The Doyle Drive Project is included in the current *regional transportation plan* (RTP), the current version of which is known as *Transportation 2030*, in the Financially Constrained Element with a combination of programmed and planned local, state, and federal funds available over the long term of the *Transportation 2030 Plan*. The Doyle Drive Project is also included in the 2008 *Regional Transportation Improvement Program* (RTIP) and *State Transportation Improvement Program* (STIP).

In February 2008 MTC began the process of updating the RTP with the issuance of the Notice of Preparation (NOP) for the preparation of the Draft EIR for the *Transportation 2035 Plan*. Two scoping meetings were held in March 2008 to solicit input on the scope and content of the Draft EIR. The program-level EIR for the *Transportation 2035 Plan* analyzed the broad, regional environmental impacts of implementing the investments identified in the plan.

In July 2008, as part of 2009 RTP update, the MTC adopted the Draft Financially Constrained Investment Plan, which includes the Doyle Drive Replacement Project at a total cost of \$1.01 billion in escalated dollars. Subsequently, the Authority and Caltrans have been working with MTC to make technical adjustments to the project listing to reflect a full funding plan for the project corresponding to the project team's final \$1.045 billion estimated project cost for the Preferred Alternative. It is expected that final Investment Plan for the *Draft Transportation 2035 Plan* will include the necessary funding for the construction of the Doyle Drive Project, and the MTC is preparing a letter to FHWA to this effect.

In December 2008, MTC expects to circulate the Draft EIR and *Draft Transportation 2035 Plan* for a 45-day public review period including a public hearing. It is anticipated that both documents will be approved and finalized in March 2009.

**Exhibit S-9
Summary of Permanent Impacts: Human Environment**

	ALTERNATIVE 1: NO-BUILD	ALTERNATIVE 2: REPLACE AND WIDEN (NO-DETOUR & DETOUR OPTIONS)	ALTERNATIVE 5: PRESIDIO PARKWAY (DIAMOND & CIRCLE DRIVE OPTIONS)	PREFERRED ALTERNATIVE: REFINED PRESIDIO PARKWAY
Land Use Plans and Policies	-Inconsistent with the Presidio Trust Management Plan (PTMP) Guidelines, Presidio Vegetation Management Plan (VMP), San Francisco General Plan (SFGP), Doyle Drive Task Force Report (DTRF), and the General Management Plan Amendment (GMPA)	-Removal of 387 m ² (4,166 ft ²) total building area (No-Detour) and 5,436 m ² (58,513 ft ²) (Detour) -Inconsistent with the PTMP, GMPA, VMP, and the SFGP (Both options)	-Removal of 3,553 m ² (38,249 ft ²) total building area (Diamond) and 5,559 m ² (59,933 ft ²) (Circle) -Merchant Road Slip Ramp would require an additional 805 m ² (8,665 ft ²) total building area -Reduces area for possible Crissy Marsh expansion (Both options) -Inconsistent with the FTMP, VMP, and SFGP (Both options)	-Removal of 3,061 m ² (33,329 ft ²) total building area -Reduces area for possible Crissy Marsh expansion -Inconsistent with the FTMP, VMP, and SFGP
Parks and Recreation	-No change to current conditions	-Loss of 0.9 hectares (2.2 acres) (No-Detour) and 0.6 hectares (1.5 acres) (Detour)	-Loss of 4.6 hectares (11.4 acres) (Diamond) and Loss of 4.5 hectares (11.1 acres) (Circle) -Removal of swimming pool (Circle) -Merchant Road Slip Ramp: require an additional 0.5 hectares (1.2 acres) (Both options)	-Loss of 2.6 hectares (6.4 acres) -2.4 hectares (5.9 acres) available as parkland
Growth	-Potential traffic restrictions on Doyle Drive could potentially limit planned growth in the Presidio	-Since this alternative does not provide direct access to the Presidio, it may limit planned growth in the Presidio (Both options)	-Access to the Presidio, via this alternative, is compatible with planned growth in the Presidio (Both options)	-Access to the Presidio, via this alternative, is compatible with planned growth in the Presidio
Community Impacts	-No change to current conditions	-Need for 4 additional parking spaces (No-Detour) and 20 additional parking spaces (Detour) prior to mitigation -Improve emergency access (Both options) -Relocation of utilities (Both options) -Displacement of 5 employees (No-Detour) and 38 employees (Detour)	-Need for 10 additional parking spaces (Both options) prior to mitigation -Improve emergency access (Both options) -Relocation of utilities (Both options) -Displacement of 35 employees (Diamond) and 55 employees (Circle)	-Need for 142 additional parking spaces prior to mitigation -Improve emergency access -Relocation of utilities -Displacement of 35 employees
Relocation	-No change to current conditions	Removal of 1 commercial building (No-Detour) and 4 buildings (2 vacant and 2 commercial/retail) (Detour)	Removal of 9 buildings (4 office, 3 vacant, 1 commercial and 1 utility infrastructure) (Diamond) and 10 buildings (4 office, 3 vacant, 1 commercial, 1 recreational, and 1 utility infrastructure) (Circle) Merchant Road Slip Ramp would remove an additional 4 residential buildings (Both options)	Removal of 9 buildings (4 office, 3 vacant, 1 commercial and 1 utility infrastructure). Portion of Bldg 201 would be returned
Environmental Justice	-No change to current conditions	-No change to current conditions (Both options)	-No change to current conditions (Both options)	-No change to current conditions

**Exhibit S-9 (Continued)
Summary of Permanent Impacts: Human Environment**

RESOURCE	ALTERNATIVE 1: NO-BUILD	ALTERNATIVE 2: REPLACE AND WIDEN (NO-DETOUR & DETOUR OPTIONS)	ALTERNATIVE 3: PRESIDIO PARKWAY (DIAMOND & CIRCLE DRIVE OPTIONS)	PREFERRED ALTERNATIVE: REFINED PRESIDIO PARKWAY
Traffic and Transportation	<ul style="list-style-type: none"> -Intersection Level of Service: ranges from A to F -Segment Level of Service: ranges from B to F -Weaving Level of Service: ranges from E to E -Pedestrian and Bicycle Operations: Removal of sidewalk, other trails within the Presidio available for use (Both options) 	<ul style="list-style-type: none"> -Intersection Level of Service: ranges from A to F -Segment Level of Service: ranges from B to F -Weaving Level of Service: ranges from E to E -Pedestrian and Bicycle Operations: Removal of sidewalk, other trails within the Presidio available for use (Both options) 	<ul style="list-style-type: none"> -Intersection Level of Service: ranges from A to F -Segment Level of Service: ranges from B to F -Weaving Level of Service: ranges from E to E -Pedestrian and Bicycle Operations: Removal of sidewalk, other trails within the Presidio available for use (Both options) 	<ul style="list-style-type: none"> -Intersection Level of Service: ranges from A to F -Segment Level of Service: ranges from B to F -Weaving Level of Service: ranges from B to E -Pedestrian and Bicycle Operations: Removal of sidewalk, other trails within the Presidio available for use (Both options)
Transit	<ul style="list-style-type: none"> -No impact to capacity of transit routes -No major change in transit travel time -No additional bus service demand (Both options) 	<ul style="list-style-type: none"> -No impact to capacity of transit routes -No major change in transit travel time -No additional bus service demand (Both options) 	<ul style="list-style-type: none"> -No impact to capacity of transit routes -No major change in transit travel time -No additional bus service demand (Both options) 	<ul style="list-style-type: none"> -No impact to capacity of transit routes -No major change in transit travel time -No additional bus service demand
Visual and Aesthetics	<ul style="list-style-type: none"> -No change to existing views 	<ul style="list-style-type: none"> -Ranges from no change to adverse depending upon the location -Adverse impacts to viewpoints at the Main Post (Both options) 	<ul style="list-style-type: none"> -Ranges from beneficial to adverse depending upon the location -Adverse impacts to viewpoints at the Girard Road and Marion at Lyon (Both options) 	<ul style="list-style-type: none"> -Ranges from beneficial to adverse depending upon the location -Adverse impacts to viewpoints at the Girard Road and Marion at Lyon
Cultural Resources	<ul style="list-style-type: none"> -No change to existing conditions 	<ul style="list-style-type: none"> -Adverse effect to Presidio NHD by removal of Doyle Drive alterations to contributing elements (5 streets as well as historic landscape features), and the addition of new, non-historic elements within the historic district. Adverse effect to Golden Gate Bridge by removal of Doyle Drive (a contributing element) adverse effects by removal of Marina and Presidio viaducts of Doyle Drive. No adverse effect to Palace of Fine Arts; no adverse effect with conditions to archaeological site CA-SFR 6/26. (Both options) - Adverse effect by removal of Buildings 1182, 1183, 1184, 1185 (four Mason Street warehouses which are contributing elements of NHD; temporary removal and replacement at their original locations after project completion is expected.) (Detour) 	<ul style="list-style-type: none"> -Adverse effect to Presidio NHD by removal of Buildings 201, 204, 230, 670 and Doyle Drive; alterations to NHD contributing elements (10 streets as well as historic landscape features, including portions of the bluff), and the addition of new, non-historic elements within the historic district. Hook Ramp option would result in alteration of one additional street of NHD. Adverse effect to Golden Gate Bridge by removal of Doyle Drive (a contributing element); adverse effects by removal of Marina and Presidio viaducts of Doyle Drive. No adverse effect to Palace of Fine Arts; no adverse effect with conditions to archaeological site CA-SFR 6/26. (Both options) -Adverse effect to Presidio NHD by removal of Building 1151 (Circle) 	<ul style="list-style-type: none"> -Adverse effect to Presidio NHD by removal of Buildings 201 (bottom portion only), 204, 230, 670 and Doyle Drive; alterations to NHD contributing elements (10 streets as well as historic landscape features, including portions of the bluff), and the addition of new, non-historic elements within the historic district. Adverse effect to Golden Gate Bridge by removal of Doyle Drive (a contributing element); adverse effects by removal of Marina and Presidio viaducts of Doyle Drive. No adverse effect to Palace of Fine Arts; no adverse effect with conditions to archaeological site CA-SFR 6/26.

**Exhibit S-10
Summary of Permanent Impacts: Physical Environment**

RESOURCE	ALTERNATIVE 1: NO-BUILD	ALTERNATIVE 2: REPLACE AND WIDEN (NO-DETOUR & DETOUR OPTIONS)	ALTERNATIVE 5: PRESIDIO PARKWAY (DIAMOND & CIRCLE DRIVE OPTIONS)	PREFERRED ALTERNATIVE: REFINED PRESIDIO PARKWAY
Hydrology, Water Quality, and Stormwater	-No change to existing conditions	-Increased runoff, but no increase to pollutant loading is expected -Increase in impervious surfaces (additional 24,200 square meters [260,000 square feet]) (Both options)	-Decreased runoff, reduction of pollutant loading potential for increased flooding in low lying portions of the alignment -Groundwater in the vicinity of the bluffs could be altered -Drainage and vegetation management near the tunnel box could be altered Impervious surface will increase slightly (3,400 square meters [36,300 square feet]), however 25 percent is in tunnel; therefore, actual impervious surface will decrease from existing conditions (Both options)	-Decreased runoff, reduction of pollutant loading potential for increased flooding in low lying portions of the alignment -Groundwater in the vicinity of the bluffs could be altered -Drainage and vegetation management near the tunnel box could be altered Impervious surface will increase slightly (3,400 square meters [36,300 square feet]), however 25 percent is in tunnel; therefore, actual impervious surface will decrease from existing conditions
Geology, Soils, Seismicity and Topography	-Earthquake could lead to failure of the low-winduct	-Removal of soils and bedrock (30,100 cubic meters [39,300 cubic yards]) (Both options)	-Removal of soils and bedrock (153,200 cubic meters [200,300 cubic yards]); (Both options)	-Removal of soils and bedrock (109,600 cubic meters [143,300 cubic yards]);
Hazardous Materials and Waste	-No change to existing conditions	-No impacts, limited to temporary, construction-related activities (Both options)	-No impacts, limited to temporary, construction-related activities (Both options)	-No impacts, limited to temporary, construction-related activities
Air Quality	-No change to existing conditions	-No change to existing conditions (Both options)	-No change to existing conditions (Both options)	-No change to existing conditions
Noise and Vibration	-31 locations will approach, equal or exceed national Noise Abatement Criteria	-34 locations will approach, equal, or exceed national Noise Abatement Criteria (Both options)	-25 locations will approach, equal, or exceed national Noise Abatement Criteria (Both options)	-25 locations will approach, equal, or exceed national Noise Abatement Criteria
Energy	-812 billion BTU's expended annually	-820 billion BTU's expended annually (Both options)	-828 billion BTU's expended annually (Diamond) and 827 billion BTU's expended annually (Circle)	-828 billion BTU's expended annually

Exhibit S-11
Summary of Permanent Impacts: Biological Environment

RESOURCE	ALTERNATIVE 1: NO-BUILD	ALTERNATIVE 2: REPLACE AND WIDEN (NO-DETOUR & DETOUR OPTIONS)	ALTERNATIVE 5: PRESIDIO PARKWAY (DIAMOND & CIRCLE DRIVE OPTIONS)	PREFERRED ALTERNATIVE: REFINED PRESIDIO PARKWAY
Natural Communities	-No charge to existing conditions	-Removal of 2.94 hectares (7.28 acres) of plant communities other than wetlands (No- Detour) and 2.73 hectares (6.75 acres) (Detour)	For both the Diamond and Circle Options: -Removal of 5.03 hectares (12.44 acres) to 5.5 hectares (13.83 acres) of plant communities other than wetlands (Loop) -Removal of 5.32 hectares (12.41 acres) to 5.99 hectares (13.80 acres) of plant communities other than wetlands (Hook)	-Removal of 5.04 hectares (12.48 acres) to 21.23 hectares (52.45 acres) of plant communities other than wetlands
Wetlands and Other Waters of the United States	-No charge to existing conditions	-USACE jurisdiction: removal of 0.13 hectares (0.33 acres) -Cowardin Excluding USACE: removal of 0.07 hectares (0.17 acres) (Both options)	-USACE jurisdiction: removal of 0.13 hectares (0.33 acres) -Cowardin Excluding USACE: removal of 0.08 hectares (0.19 acres) (Both options)	-USACE jurisdiction: removal of 0.13 hectares (0.33 acres) -Cowardin Excluding USACE: removal of 0.08 hectares (0.19 acres)
Plant Species	-No charge to existing conditions	-Potential removal of skunkweed and gumpiant (Both options)	-Potential removal of skunkweed and gumpiant (Both options)	-Potential removal of skunkweed and gumpiant
Animal Species	-No charge to existing conditions	-Removal of vegetation and wetlands/water (see above) could affect wildlife habitat. -Removal of existing Doyle Drive structures may affect bat habitat. (Both options)	-Removal of vegetation and wetlands/water (see above) could affect wildlife habitat. -Removal of existing Doyle Drive structures may affect bat habitat. (Both options)	-Removal of vegetation and wetlands/water (see above) could affect wildlife habitat. -Removal of existing Doyle Drive structures may affect bat habitat.
Invasive Species	-No charge to existing conditions	-Potential for weedy, invasive plants to establish along the portions of Doyle Drive (Both options)	-Potential for weedy invasive plants to establish along the portions of Doyle Drive (Both options)	-Potential for weedy invasive plants to establish along the portions of Doyle Drive

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CHAPTER ONE

PURPOSE AND NEED

This *Final Environmental Impact Statement/Report* (FEIS/R) incorporates the entire *South Access to the Golden Gate Bridge - Doyle Drive Project Draft Environmental Impact Statement/Report* (DEIS/R) which was released for public review in December 2005. In addition, this document includes the public and agency comments and the project team's response to those comments, as well as new research which was performed since the release of the DEIS/R.

Following release of the DEIS/R, review of comments, and public workshops, a preferred alternative was selected. This FEIS/R discusses the selection and description of the Preferred Alternative. In addition, potential impacts and mitigation related to the Preferred Alternative are also discussed. **Appendix L** presents public comments received on the DEIS/R and project team responses.

1.1 Context

Doyle Drive, built in 1936, is the stretch of Route 101 that provides access to the city of San Francisco from the Golden Gate Bridge, and southern access to Marin County and other Bay Area communities (see **Exhibit 1-1** on the following page). This roadway requires extensive seismic, structural and traffic safety upgrades.

Because of its importance within the Bay Area's regional transportation system, the Federal Highway Administration (FHWA), the California Department of Transportation (Caltrans), and the San Francisco County Transportation Authority (the Authority) have proposed to improve the approximately 2.4 kilometer (1.5 mile) Doyle Drive. Also playing major roles in the development and implementation of this project are the National Park Service (NPS), the Presidio Trust (Trust), and the Department of Veterans Affairs (VA).

In addition to benefiting motorists using the Golden Gate Bridge, the improvements to Doyle Drive would be beneficial to residents, tourists and others driving to and from the Presidio, the Golden Gate National Recreation Area (GGNRA), the Palace of Fine Arts, the Exploratorium, and other destinations.

Exhibit 1-1
Regional Context of Doyle Drive



1.2 Project Background

The Doyle Drive portion of Route 101 provides the southern access to the Golden Gate Bridge and is part of the primary north-south link in coastal California. Currently, over 91,000 vehicles use Doyle Drive every weekday. Typically, 80 percent of the vehicles traveling on Doyle Drive are coming from or going to the Golden Gate Bridge. The remaining 20 percent of the vehicles begin or end their trips in San Francisco. Doyle Drive weekend traffic volumes are comparable to weekday volumes, confirming that it serves as both a primary commute and a recreational route.

1.2.1 Doyle Drive and the Presidio

The Presidio has served as a military post for more than 200 years, under the flags of Spain, Mexico and the United States. Between 1848 and its closure in 1994, the Presidio protected commerce and trade, and played a logistical role in major United States military conflicts.

In 1962, that the Presidio became a National Historic Landmark District (NHLD), and Doyle Drive was determined to be a contributing structure within that landmark district (see **Exhibit 1-2**).

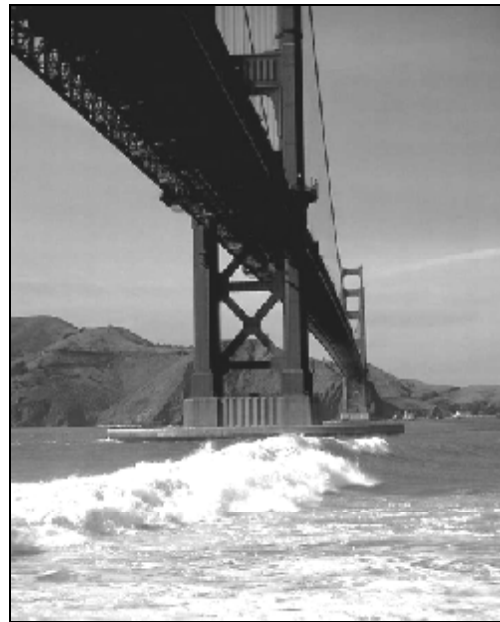
In 1972, the Golden Gate National Recreation Area was created, and the Presidio was designated to be part of the recreation area if the military ever closed the base. As part of a military base reduction program in 1989, Congress decided to close the post. As such, the Presidio was transferred to the National Park Service on October 1, 1994. Then in 1998, the management of the Presidio became split between the National Park Service (Area A) and the Presidio Trust (Area B).

1.3 Project History

The history of this project dates back to 1933 when the Golden Gate Bridge and Highway District (renamed in 1969, the Golden Gate Bridge Highway and Transportation District) started construction on Doyle Drive as the southern approach to the Golden Gate Bridge. Doyle Drive was named after Frank P. Doyle, a director of the California State Automobile Association. Mr. Doyle was a roadway advocate and civic leader, and the first private citizen to cross the Golden Gate Bridge.

Doyle Drive was designed and built to operate with three, three-meter (ten-foot) lanes in each direction, separated by painted double stripes. In September 1945, Doyle Drive became a state highway. Subsequently, the California Division of Highways, now known as Caltrans, assumed responsibility for maintenance of the section extending from near the Golden Gate Bridge toll plaza to the Palace of Fine Arts and the Marina District of San Francisco.

In 1955, the Golden Gate Bridge Highway District requested that the State widen and reconstruct Doyle Drive to handle increasing congestion. In 1962, the District specifically asked for an eight-lane divided roadway as part of a proposed Golden Gate Freeway. The proposal was not pursued due to public objection. In 1970, after a fatal accident on the facility, the National Transportation Safety Board recommended that Doyle Drive be upgraded to current freeway design standards. In 1973, a *Draft Environmental Impact Statement* (DEIS) was completed for reconstruction of Doyle Drive as an eight-lane highway with a fixed median barrier. The public objected to the proposal, and the following year the state legislature passed the Marks Bill, which prohibited



Doyle Drive provides access to the Golden Gate Bridge

Caltrans from widening Doyle Drive to more than six lanes without the specific approval of the San Francisco Board of Supervisors.

In 1985, the San Francisco Board of Supervisors recommended that Caltrans develop alternatives that would improve safety but not increase the number of vehicles using Doyle Drive. Caltrans responded with two alternative recommendations: an eight-lane roadway design and a six-lane roadway design. The issues surrounding each of these alternatives were never resolved and a preferred solution was not identified.

1.3.1 Continued Studies: 1990's through Present

In 1991, Caltrans requested that the San Francisco Board of Supervisors revisit the most recent design concepts for Doyle Drive. The Supervisors responded with the establishment of the Doyle Drive Task Force, consisting of representatives from various local governments and public and private organizations. The Task Force considered design alternatives, developed a consensus on a preferred alternative, and in 1993 issued the *Report of the Doyle Drive Task Force*, which proposed a scenic parkway through the Presidio.

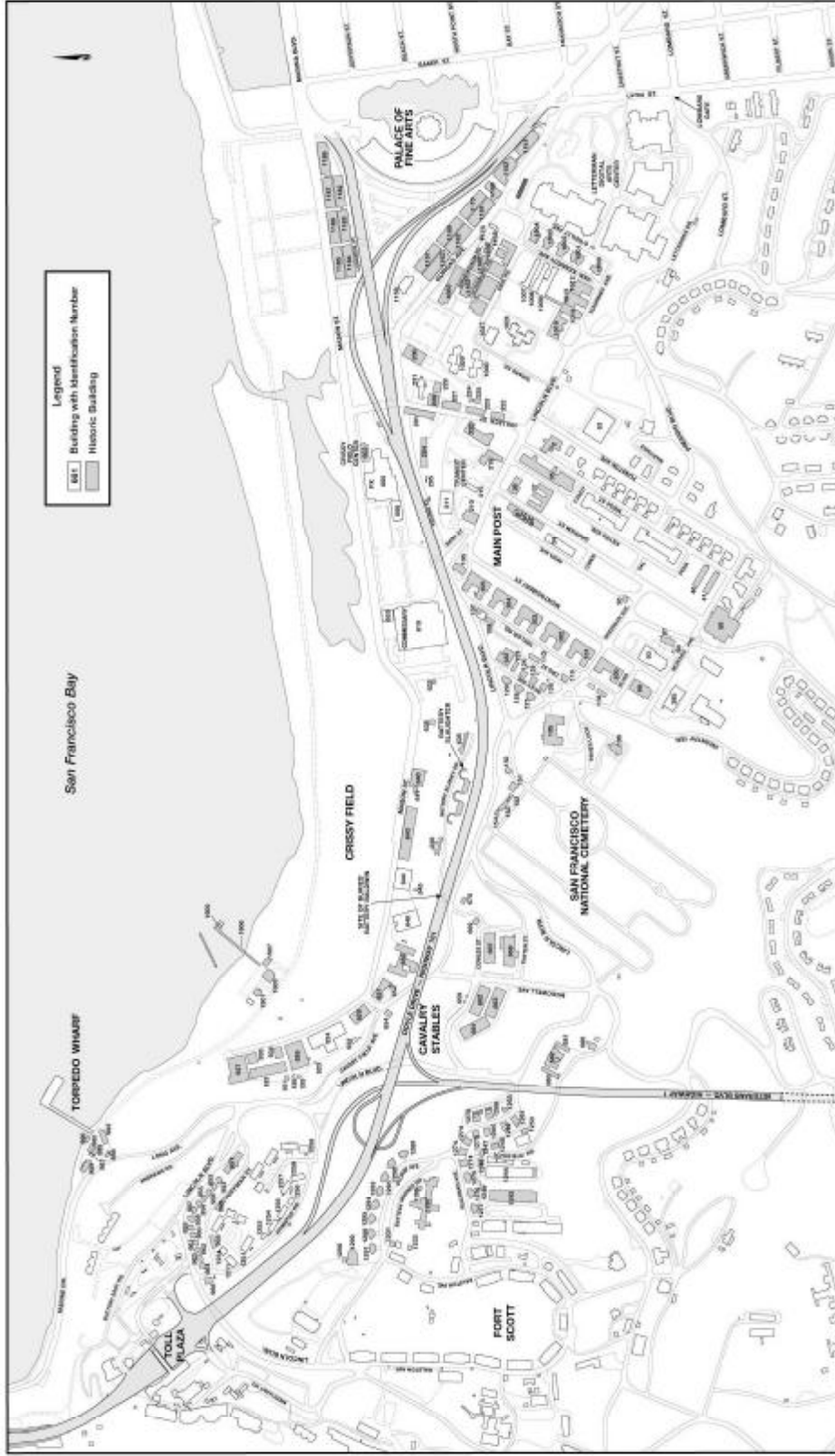


Historic structures within the Presidio

This parkway concept envisioned three travel lanes in a separate tunnel in each direction and an additional eastbound auxiliary lane between the Park Presidio Interchange and a new direct access point to the Presidio. In principle, the Board of Supervisors unanimously approved the recommendations of the Task Force and urged Caltrans to expedite inclusion of rebuilding Doyle Drive in the next state transportation funding cycle.

In the same year, Caltrans completed a project study report for the replacement of Doyle Drive. The Task Force's recommended concepts were included in the alternatives evaluated in the Caltrans report.

Exhibit 1-2
Doyle Drive and the Presidio



In July 1994, the National Park Service published the *Final General Management Plan Amendment* (GMPA), which identified the following objectives for Doyle Drive:

- redesign the Doyle Drive corridor as a parkway rather than a freeway;
- respect the Presidio's status as a National Historic Landmark District in redesign options;
- minimize the effects of noise and other pollution from the parkway on natural and recreational areas at Crissy Field and other areas adjacent to the Presidio;
- improve the Presidio entrance and circulation features as part of the Doyle Drive redesign; and
- maintain the functions that the Doyle Drive corridor provides as part of the regional and city transportation network.

Additionally, in 1994, the San Francisco County Transportation Authority initiated the *Doyle Drive Intermodal Study*, which was funded by a Caltrans state planning and research grant, "to further the development and ultimate implementation of a realistic and fundable replacement for Doyle Drive."

The results of the *Intermodal Study* were released in 1996. They supported the Doyle Drive Task Force and GMPA-recommendations that multi-modal and direct vehicular access, in and out of the Presidio, would be the central features of the replacement design.

The study also emphasized that the Doyle Drive replacement be designed as a parkway. Other important recommendations included building a transit center, and introducing transportation systems management and intelligent transportation systems technology, such as roadway surveillance cameras and real-time transit information kiosks.



View of Doyle Drive looking west

1.3.2 Related Plans and Projects

In addition to the proposed South Access to the Golden Gate Bridge - Doyle Drive Project, other planning efforts for future projects and developments in the Presidio are moving forward. Some of these plans include: the National Park Service's *General Management Plan Amendment* (GMPA); the Presidio's *Vegetation*

Management Plan (VMP); the Presidio Trails and Bikenways Master Plan; and the Presidio Trust Management Plan (2002). More information about these plans, and other projects within the Presidio, is presented in Chapters 3 and 5 of this document.

1.3.3 Environmental and Engineering Analysis: the Next Step

This environmental document has been initiated as the next step in the progression of the proposed South Access to the Golden Gate Bridge – Doyle Drive Project (Doyle Drive 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 the *California Environmental Quality Act (CEQA)*.

Since the Doyle Drive Project, is being initiated by state and county agencies, and is programmed for federal funding, it must follow federal and state environmental laws (NEPA and CEQA). Pursuant to these environmental regulations, this *Final Environmental Impact Statement/Report (FEIS/R)* contains a discussion of proposed project alternatives, existing environmental and community resources, potential permanent and temporary impacts, and proposed mitigation. In addition, this document provides information about the comments received and discussions from both the public and agencies to the DEIS/R, as well as from continued project development. Pursuant to CEQA, this document also identifies the environmentally superior alternative (see Chapter 4).

1.4 Project Purpose and Need

NEPA analyses require that a proposed project's alternatives be developed based upon the project's purpose and need. The purpose and need statement should clearly and succinctly explain why the project is needed and the project's intended purpose. The purpose and need is considered the cornerstone of NEPA environmental documentation.

The following purpose and need statement was prepared in accordance with FHWA *Technical Advisory T 6640.8*. It also reflects the recommendations of federal, state, regional, and local agencies, as well as community members and legislators who have, over the past three years, refined the project's purpose and need through a collaborative process.

1.4.1 Project Purpose

The purpose of the proposed project is to improve the seismic, structural, and traffic safety of Doyle Drive within the setting and context of the Presidio of San Francisco and its purpose as a National Park.



Doyle Drive viaduct structure

- Specific objectives of the Doyle Drive Project, as they relate to the project's purpose, are to improve the seismic, structural and traffic safety on Doyle Drive;
- maintain the functions that the Doyle Drive corridor serves as part of the regional and city transportation network;
- improve the functionality of Doyle Drive as an approach to the Golden Gate Bridge;
- preserve the natural, cultural, scenic and recreational values of affected portions of the Presidio;
- be consistent with the *San Francisco General Plan* and the *General Management Plan Amendment Final Environmental Impact Statement, Presidio of San Francisco, Golden Gate National Recreation Area* (NPS 1994a and 1994b) for Area A of the Presidio and the *Presidio Trust Management Plan: Land Use Policies for Area B of the Presidio of San Francisco* (Presidio Trust 2002);
- minimize the effects of noise and other pollution from the Doyle Drive corridor on natural and recreational areas at Crissy Field and other areas adjacent to the project;
- minimize the traffic impacts of Doyle Drive on the Presidio and local roadways;
- improve intermodal and vehicular access to the Presidio; and
- redesign the Doyle Drive corridor using the parkway concept described within the *Doyle Drive Intermodal Study* (1996).

1.4.2 Project Need

Doyle Drive is approaching the end of its useful life after over 70 years of operation. In the short-term, regular maintenance, seismic retrofit, and rehabilitation activities are keeping the structure safe. However, in the long-term, permanent improvements are needed to bring Doyle Drive up to current design and safety standards. **Exhibit 1-3** summarizes the need for the project.

**Exhibit 1-3
Need for this Project**

ELEMENT	DEFICIENCY	RESULT
STRUCTURAL DEGRADATION	<ul style="list-style-type: none"> ▪ Age of the facility ▪ The effects of heavy traffic ▪ Exposure to salt air 	Seismically and structurally below standard
LOCATION	Eastern portion is located in an identified liquefaction ¹ zone	Structural failure during an earthquake
DESIGN	Original design does not meet today's safety standards	Today's vehicle fleet combined with traffic volumes and vehicle maneuvers add to driving patterns not anticipated when Doyle Drive was designed
ACCESS	No direct vehicular access into the Presidio	Limited access to facilities within the Presidio

¹Liquefaction is the process by which a solid behaves as a liquid. This is often the case with some soils, resulting in landslides. Liquefaction can also happen during an earthquake in certain filled areas.

Structural Degradation

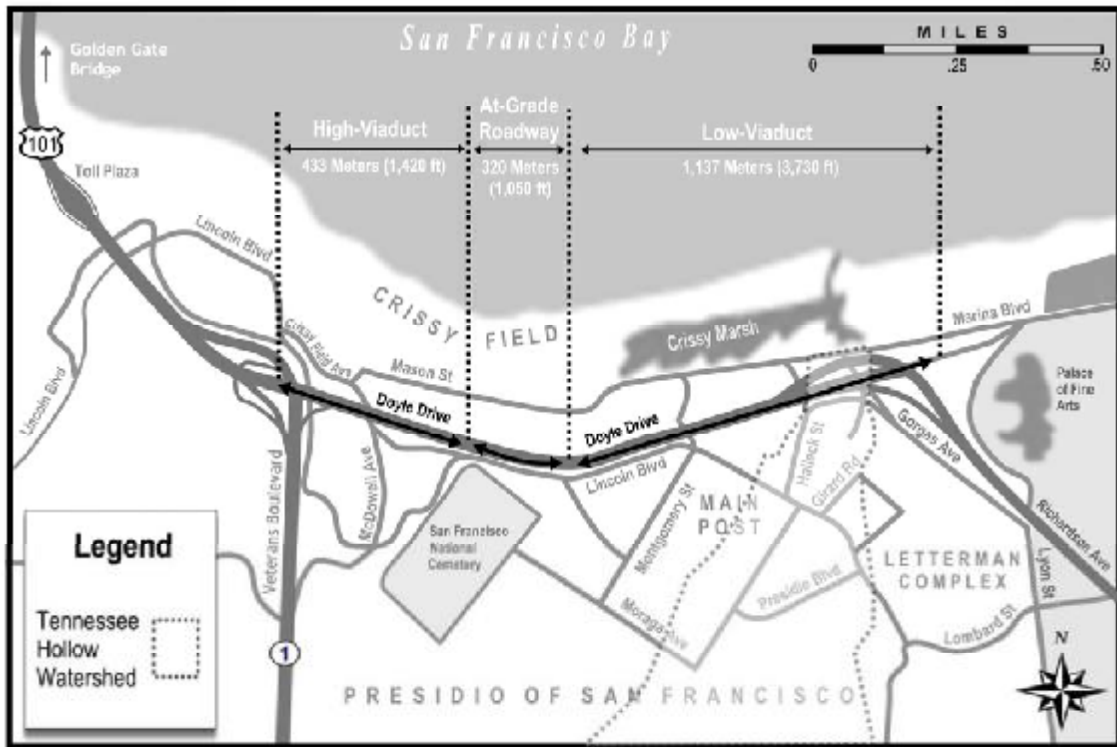
The Doyle Drive roadway contains two viaduct sections (see **Exhibit 1-4 and 1-5**). In 1995, the low-viaduct was retrofitted to withstand a probabilistic earthquake assuming that Doyle Drive would be replaced within a ten-year period. The substructure (foundations and the main trusses) of the high-viaduct was retrofitted for a maximum credible earthquake¹.

**Exhibit 1-4
Main Doyle Drive Structures**

BRIDGE NUMBER	BRIDGE NAME	YEAR BUILT	ALTERNATE NAME USED IN THE DOCUMENT
34-0014	Marina Viaduct	1936	Low-viaduct
34-0018	Ruckman Avenue UC	1939	Ruckman Avenue
34-0019	Presidio Viaduct	1936	High-viaduct

¹ The Maximum Credible Earthquake (MCE) is the largest ground motion expected to occur at the project site once every 1,500 years.

Exhibit 1-5
Location of Doyle Drive Viaducts and other Key Features



However, neither of these retrofits addressed the bridge decks. The long-term effects of heavy traffic and exposure to salt air have caused Doyle Drive's structure to deteriorate. In the early 1990s, the concrete decks were sealed and coated with corrosion inhibiting polymer. These measures slowed the rate of corrosion and concrete deterioration and added up to ten years of service to the life of the viaduct bridge decks. However, the decks need to be replaced because they have deteriorated and are near the end of their useful life span.

While the previous corrosion prevention and seismic stabilization measures provided short-term solutions to the deck degradation and seismic vulnerability issues, they did not bring the roadway up to current design and safety standards. The current lifespan of Doyle Drive was not ultimately prolonged by these measures. These measures only delayed the roadway's replacement. In the interim, the high-viaduct will increasingly become a financial burden as Caltrans will need to perform more frequent routine maintenance and monitoring to ensure its safety. Caltrans is currently performing extensive rehabilitation work to further stabilize the degradation of the high-viaduct. Should additional structural degradation lead to Doyle Drive closures or accessibility restrictions, the consequences to the regional transportation network would be dramatic.

Location in a Liquefaction Zone

The eastern half of the Doyle Drive alignment, which includes the low-viaduct section and lower Tennessee Hollow watershed, is within a potential liquefaction zone. Soils in this area, occurring at shallow depths not exceeding ten meters (33 feet), include loose, well-sorted sands and silts. There is also evidence of potentially liquefiable saturated soils at the location of the high-viaduct.

Liquefaction, due to ground shaking during a strong earthquake, could cause soils to subside rapidly and unevenly. Heavy structures, such as the low- or high-viaducts, could subsequently collapse or be severely damaged due to this sinking of the ground and the loss of lateral support of the foundation elements.

Nonstandard Design Elements

The existing roadway has many nonstandard design elements. Existing lane widths range between 2.9 and 3 meters (9.5 and ten feet) compared to the current standard of 3.6-meter (12-foot) lanes.

The existing roadway does not have shoulders. Current Caltrans design standards call for three-meter (ten-foot) wide shoulders on either side of the roadway. The current lack of shoulders, and the resultant inability to clear disabled vehicles from travel lanes, contributes to the high level of congestion and increased likelihood of serious accidents.

The tight curves of the Park Presidio Interchange ramps cause vehicles to brake abruptly to exit the roadway. This, in turn, causes traffic to slow down, which contributes to increased congestion on Doyle Drive. Weaving in this area also contributes to increased congestion. In addition, the acceleration lengths of the exit ramps are insufficient, given the speed of the approaching vehicles.

Vehicular Access into the Presidio

Access between Doyle Drive and the Presidio is currently indirect via roads located within the Golden Gate Bridge Toll Plaza area. The ramps at the Toll Plaza connect to Merchant Road (on the west) and the Golden Gate Bridge service roads (to the east). These roads then connect to Lincoln Boulevard, which provides access to the Presidio. A new slip ramp² from northbound Richardson Avenue to the intersection of Marshall Street and Gorgas Avenue was completed in 2005 to provide access for the Letterman facility. The new slip ramp only provides access to the Presidio for northbound traffic. When access to the Presidio is provided via Doyle Drive, the slip ramp will be eliminated.

Currently, the lack of direct access into the Presidio has forced Doyle Drive traffic to detour through city neighborhoods adjacent to the Presidio gates. As illustrated in **Exhibit 1-6** usage of the Presidio is expected to increase dramatically over the next 20 years. Without proper access to the Presidio,

² A slip ramp is a short connector ramp that is located between a major roadway and its adjacent frontage road. These ramps allow motorists to "slip" from one roadway to another.

increased traffic will have a greater negative affect on the surrounding neighborhoods.

**Exhibit 1-6
Current and Projected Presidio Users**

	2001	2020	INCREASE
EMPLOYEES	2,020	7,190	256%
RESIDENTS	2,250	3,720	65%
ANNUAL VISITORS	5.1 million	9.9 million	95%

Source: *The Presidio Trust, 2002.*

The *Doyle Drive Intermodal Study* stated that direct access to the Presidio from Doyle Drive should be a key feature of the current replacement strategy. The study recommends that the strategy to replace Doyle Drive should also enhance multi-modal access choices into the Presidio, including improved transit service and connections, and enhanced pedestrian and bicycle facilities.

1.4.3 Logical Termini and Independent Utility

The Federal Highway Administration's *Title 23 CFR 771.111(f)* states that three criteria must be considered to ensure meaningful evaluation of alternatives and to avoid commitments to future transportation improvements before they are fully evaluated. Independent project sections must:

- connect logical termini and be of sufficient length to address environmental matters on a broad scope;
- have independent utility or independent significance, i.e., be usable and be a reasonable expenditure, even if additional transportation improvements in the area are not made; and
- not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Logical Termini and Sufficient Length and Scope

The Doyle Drive portion of Route 101 encompasses the low- and high-viaduct segments of Doyle Drive and the Park Presidio Interchange with Route 1, including the at-grade roadway portions adjacent, and in between, these structures. The eastern terminus begins at Lyon Street where the new facility conforms to the existing city street network and the western terminus extends to the Golden Gate Bridge Toll Plaza.

The termini of the Doyle Drive project are logical because the project intends to replace both viaducts on Doyle Drive and the Park Presidio Interchange. The interchange lies just east of the Toll Plaza area and transitions to the high-

viaduct. The low-viaduct ends where it transitions to grade at Richardson Street west of Lyon Street. Therefore, the proposed project begins at the Toll Plaza and ends at Lyon Street and includes all intersections and interchanges in between.

Independent Utility

Transportation projects must also have independent utility according to FHWA regulations. That is, the project must be a reasonable expenditure even if no additional transportation improvements in the area are made. The proposed alternatives considered in this FEIS/R represent transportation improvements that meet the project's purpose and need and minimize impacts to the cultural, natural, and community resources along Doyle Drive. Chapter Two of this document includes a description of the Preferred Alternative and how it meets the project needs even if no additional transportation improvements are made within the corridor.

Not Restrict Consideration of Alternatives

Finally, FHWA regulations require that a transportation project not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. The proposed Doyle Drive Project would not limit the consideration of alternatives for transportation improvements which may be proposed for the Golden Gate Bridge, Highway 1, or surrounding surface roadways in the Presidio.

1.5 Project Partners

A number of agencies are participating in this Doyle Drive Project environmental process. The agencies and their roles are discussed below.

Federal Lead Agency

A *National Environmental Policy Act* (NEPA) document is required for most federal actions. An action can include funding a project, building a project on federal land, or issuing a federal permit. The federal agency which 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 Doyle Drive Project, the Federal Highway Administration (FHWA) is the lead federal agency for the purposes of NEPA. The Authority and Caltrans are also co-lead agencies on this project.

State Lead Agency

Similar to NEPA regulations, the *California Environmental Quality Act* (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 Doyle Drive Project is the

Authority and it has the responsibility for complying with state environmental regulations.

CEQA Responsible Agencies

Under CEQA, a Responsible Agency reviews the environmental document and is responsible for considering the environmental effects of the project. For this project, Caltrans, the Golden Gate Bridge, Highway and Transportation District and the City and County of San Francisco are the CEQA Responsible Agencies. Caltrans is also the owner and operator of Doyle Drive.

NEPA Cooperating Agencies

Upon request of the lead agency, any other federal agency having jurisdiction within the project area, or having special expertise with respect to any environmental issue, may be a cooperating agency. The three cooperating agencies for the Doyle Drive Project are the:

- Presidio Trust;
- United States Department of the Interior, National Park Service (NPS) - Golden Gate National Recreation Area; and
- United States Department of Veteran Affairs (VA).

To satisfy both NEPA and CEQA requirements, the lead agencies with input from the cooperating and responsible agencies, have developed this combined NEPA/CEQA document for the South Access to the Golden Gate Bridge - Doyle Drive Project.

1.6 Environmental Process

This *Final Environmental Impact Statement/Report* (FEIS/R) evaluates the environmental impacts of the proposed Doyle Drive Project during the construction and operational phases. When warranted, mitigation measures are proposed to address project impacts.

Once this *Final Environmental Impact Statement/Report* (FEIS/R) has been completed the lead agencies will follow the typical NEPA/CEQA procedures. Under NEPA a *Notice of Availability* will be published in the *Federal Register* and the document will be distributed to all federal, state, and local agencies and private organizations, and members of the public who provided substantive comments on the *Draft EIS* or who requested a copy (40 CFR 1502.19).

Typically, pursuant to 23 CFR 771.127, following release of the FEIS/R, FHWA can:

“...complete and sign a *Record of Decision* (ROD) no sooner than thirty days after publication of the FEIS notice in the *Federal Register*.... Until the ROD has been signed, no further approvals may be given except for administrative activities taken to secure further project funding....

If [FHWA] subsequently wished to approve an alternative which was not identified as the preferred alternative but was fully evaluated in the FEIS, or proposes to make substantial changes to the mitigation measures or findings discussed in the ROD, a revised ROD shall be subject to review by those [FHWA] offices which reviewed the FEIS.”

The ROD is the document which explains the reasons for the project decision, summarizes the mitigation measures to be incorporated, and documents any required *Section 4(f)* approvals.

Under CEQA procedures, the State lead agency (the Authority) will approve the project and include a statement of overriding consideration in the record of project approval. The statement of overriding consideration is necessary for projects which will result in unavoidable significant effects as identified in the FEIS/R and it will state the specific reasons why the agency supports its decision. Within five days after approval of the project, the lead agency will file a *Notice of Determination* (NOD) with the county clerk. The NOD will be available for public inspection for at least 30 days. Following the project approval process the sponsor agencies will move forward with final design and permitting. Based on available funding, permitting and construction could begin as early as 2009.

In addition, both CEQA and NEPA regulations require an enforceable mitigation monitoring program be developed for the project. Per *CEQA Guideline 15907(a)*, “In order to ensure that the mitigation measures and project revisions identified in the EIR are implemented, the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects.” Under NEPA regulations, “A monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation” (Section 1505.2(c)).”

1.6.1 Preferred Alternative

Chapter Two of this FEIS/R identifies the Preferred Alternative for this Doyle Drive Project. FHWA, Caltrans and the Authority selected this alternative based on:

- collaboration with, and input from the Doyle Drive Citizens’ Advisory Subcommittee and the cooperating agencies;
- findings from the DEIS/R; and
- state and federal agency, local government, tribal, and public comments.

1.7 Funding and Programming

Revenues for transportation improvement projects are generated from a variety of sources. The primary traditional sources for state transportation projects are state gasoline and diesel fuel taxes, vehicle weight fees, and federal revenues. Additional sources include sales tax measures, local funds other than sales taxes, and private funds. **Exhibit 1-7** presents a description of some of these programs.

Because each funding program targets specific project activities (planning, design, and construction), the proposed Doyle Drive Project has been divided into four phases. These phases are:

- Phase 1: Project Approval and Environmental Documentation (PAED) - this document and accompanying engineering are part of PAED;
- Phase 2: Plans, Specifications, and Estimates (PS&E) - final design and development of project cost estimates;
- Phase 3: Acquisition of interest and right of way; and
- Phase 4: Construction. This phase includes implementation of identified mitigation and monitoring.

Exhibit 1-8 at the end of this section presents these proposed implementation phases in relation to anticipated funding sources and committed and proposed funding amounts. The Doyle Drive Project is currently in Phase 1.

**Exhibit 1-7
State of California Transportation Funding Programs**

FUNDING PROGRAM ¹	DESCRIPTION
TCRP (Traffic Congestion Relief Program)	TCRP is a state funding source managed by the California Transportation Commission (CTC) for the Governor. The TCRP requires the CTC to adopt guidelines and implement an Exchange Program that allows the exchange of federal Congestion Mitigation and Air Quality Improvement (CMAQ) and Regional Surface Transportation Program (RSTP) funds for state transportation funds, based upon funding availability.
ITIP (Interregional Transportation Improvement Program)	ITIP is a state funding program for Interregional Transportation Improvement Program funds. Caltrans nominates and the CTC approves a listing of interregional highway and rail projects for 25 percent of the funds to be programmed in the State Transportation Improvement Program (STIP).
SHOPP (State Highway Operation and Protection Program)	SHOPP is a state funding category used by Caltrans to maintain and operate state highways.
RTIP (Regional Transportation Improvement Program)	RTIP is a state funding source which provides for the 75 percent regional allocation of STIP funds for projects on and off the state highway system from the State Highway Account and other funding sources. As the Regional Transportation Planning Agency for the nine-county Bay Area region, the Metropolitan Transportation Commission biennially adopts the Bay Area RTIP and submits it to the CTC for approval and inclusion in the STIP.

¹ Latest approval year for all programs is 2006.

In order for a project to obtain federal transportation funding, it must be included in the *Regional Transportation Plan (RTP)*. The Metropolitan Transportation Commission (MTC) is responsible for adopting the Bay Area's RTP, the current version of which is known as the *Transportation 2030 Plan*. Adopted by the MTC on February 23, 2005, the *Transportation 2030 Plan* describes the strategies and investments required to maintain, manage, and improve the transportation network within the nine-county San Francisco Bay Area. MTC now updates the RTP every four years and expects to adopt the new RTP, *Transportation 2035 Plan: Change in Motion (or 2009 RTP)*, in early 2009.

Also, every two years the MTC prepares and adopts a *Regional Transportation Improvement Program (RTIP)*. Developed in cooperation with County Congestion Management Agencies (CMA) and Caltrans, the 2008 RTIP includes programming for projects on and off the state highway system over a five-year period (e.g., Fiscal Year 2008/09 through Fiscal Year 2012/13). The final 2008 RTIP was adopted by MTC on January 23, 2008, and subsequently was approved by the California Transportation Commission on May 29, 2008 as part of the 2008 *State Transportation Improvement Program (STIP)*.

The Doyle Drive Project is included in the current RTP in the Financially Constrained Element with a combination of programmed and planned local, state, and federal funds available over the long term of the *Transportation 2030 Plan*. The Doyle Drive Project is also included in the 2008 RTIP and STIP.

In February 2008 MTC began the process of updating the RTP with the issuance of the Notice of Preparation (NOP) for the preparation of the Draft EIR for the *Transportation 2035 Plan*. Two scoping meetings were held in March 2008 to solicit input on the scope and content of the Draft EIR. The program-level EIR for the *Transportation 2035 Plan* analyzed the broad, regional environmental impacts of implementing the investments identified in the plan. Throughout the process of preparing the Draft EIR and RTP, MTC has made an extensive effort to seek public input including focus group meetings, community-based focus groups, evening workshops in each of the nine Bay Area counties, telephone polls and web surveys. The public outreach encouraged members of the public, cities, counties and partner agencies to submit possible projects for consideration for inclusion in the final plan.

In July 2008, as part of 2009 RTP update, the MTC adopted the Draft Financially Constrained Investment Plan, which includes the Doyle Drive Replacement Project at a total cost of \$1.01 billion in escalated dollars. Subsequently, the Authority and Caltrans have been working with MTC to make technical adjustments to the project listing to reflect a full funding plan for the project corresponding to the project team's final \$1.045 billion estimated project cost for the Preferred Alternative. It is expected that final Investment Plan for the *Draft Transportation 2035 Plan* will include the necessary funding for the construction of the Doyle Drive Project, and the MTC is preparing a letter to FHWA to this effect.

In December 2008, MTC expects to circulate the Draft EIR and *Draft Transportation 2035 Plan* for a 45-day public review period including a public hearing. It is anticipated that both documents will be approved and finalized in March 2009.

Although full project funding is included in the long range plan, only certain sources are currently committed as shown in **Exhibit 1-8**. Additional funds for the project are to come from new and/or redirected federal funds, future RIP, and local sources including GGBHTD and MTC.

Since the prior RTP was adopted, significant progress has been made on the project's funding plan, including additional funds secured through the Federal Urban Partnership Program. In August 2007, the U.S. Department of Transportation (US DOT) designated the San Francisco Bay Area as an Urban Partner, awarding the region \$159 million in federal grant funds to implement a program of projects centered on variable pricing of Doyle Drive. Tolls would be collected at, or just south of, the Golden Gate Bridge Toll Plaza and be used to fund transportation improvements in the Doyle/US 101 corridor. The use of grant funds for the Doyle Drive Value Pricing Program – including \$35 million in funds for the Doyle Drive Replacement Project - was conditioned on the obtainment of legal authority to impose a congestion toll on Doyle Drive by March 2008. On March 14, 2008, the Golden Gate Bridge Highway and Transportation District (GGBHTD) approved a resolution committing to the imposition of a variable toll in the Golden Gate Corridor (including Doyle Drive) as soon as September, 2008 but no later than September 2009. While the level of the toll and exact use of the funds was not set, the GGBHTD's action precluded the use of toll revenues to fund the Doyle Drive Replacement Project. Subsequently, the US DOT obligated the \$35 million PLH grant that was included in the San Francisco Urban Partnership Agreement (SF UPA) for the reconstruction of Doyle Drive, but held off on obligating other UPA grant funds, including tolling system funds, pending confirmation of the SF UPA program. In the summer of 2008, the San Francisco regional partner agencies confirmed they would drop the Doyle Drive tolling project from the UPA program and look to other local funding sources and cost savings to complete the project funding plan. Depending on the actual funding sources used for the project, the impacts may need to be analyzed in a Re-evaluation/Addendum of the FEIR/EIS, or a Supplemental FEIR/EIS, as appropriate.

As shown in **Exhibit 1-8**, currently the project has committed funding of \$631 million which is short of the estimated \$1.045 billion total project capital cost that is needed to construct the Preferred Alternative.

Conformity with the Transportation Improvement Plan

The Metropolitan Transportation Commission (MTC) prepares and adopts the *Transportation Improvement Plan* (TIP) every two years. The Doyle Drive Project was included in the most recent TIP 2007 and subsequent amendments, as

approved by the FWHA on October 2, 2006. The Doyle Drive Project is included in the Draft 2009 TIP.

On February 23, 2005, the MTC issued a final transportation air quality conformity finding for the *Transportation 2030 Plan* and the *2005 TIP/Amendment #05-05*. The FHWA approved this air quality conformity finding on March 17, 2005. Since the design concept and scope of the project has not changed, the Project conforms to the *State Implementation Plan (SIP)*.

Exhibit 1-8
Proposed and Committed Funding Sources and Levels (\$ in Millions)

SOURCE	TYPE		PHASE 1 (ENVIRONMENTAL)	PHASE 2 (ENGINEERING)	PHASE 3		PHASE 4		TOTAL
					RIGHT OF WAY	RIGHT OF WAY SUPPORT	CONSTRUCTION	CONSTRUCTION SUPPORT	
PLHD Funds	Federal	Committed	\$8.2	\$1.2					\$9.4
		Proposed							
Federal High Priority	Federal	Committed	\$5.6	\$1.0	\$7.5	\$0.8			\$14.8
		Proposed							
Federal UPA	Federal	Committed		\$12.8	\$17.0		\$17.5		\$47.3
		Proposed							
State TCRP	State	Committed	\$9.0	\$6.0					\$15.0
		Proposed							
State SHOPP	State	Committed		\$24.0		\$1.0	\$364.0	\$16.0	\$405.0
		Proposed							
Prop K Sales Tax	Local	Committed	\$2.8	\$5.0			\$60.1		\$67.9
		Proposed							
STIP-RIP	Local	Committed		\$5.0	\$10.1	\$2.0	\$54.0		\$71.1
		Proposed							
Other Local*	Local	Committed							
		Proposed			\$1.7	\$0.2	\$357.4	\$54.7	\$414.0
	Totals	Committed	\$25.6	\$55.0	\$34.6	\$3.8	\$495.6	\$16.0	\$630.6
		Proposed			\$1.7	\$0.2	\$357.4	\$54.7	\$414.0
		Total	\$25.6	\$55.0	\$36.3	\$4.0	\$853.0	\$70.7	\$1,044.6

Source: San Francisco County Transportation Authority, August 2008, consistent with proposed 2009 RTP and 2009 RTIP amendment

Note: Funding plan is based upon estimated capital costs provided in Exhibit 2-38 for the Preferred Alternative. Depending on the timing and amount of funding, the project may or may not be phased. Estimated Project costs in year of expenditure dollars (in millions) are as follows:

PA/ED	\$25.6
PS&E	\$55.0
Construction	\$853.0
Construction Support	\$70.7
Right of Way	\$36.3
Right of Way Support	\$4.0
TOTAL PROJECT COST	\$1,044.6

Additional funds to come from new and/or redirected federal funds, future RIP, and local sources including GGBHTD and MTC. Information contained in this environmental document may need to be re-evaluated or supplemented depending on the actual sources of funds used on the project.

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CHAPTER TWO

PROJECT ALTERNATIVES

The San Francisco County Transportation Authority (the Authority) and the Federal Highway Administration (FHWA) are proposing to improve safety along Doyle Drive, the south access to the Golden Gate Bridge, located in the Presidio of San Francisco (the Presidio). Working with the California Department of Transportation (Caltrans), the Authority prepared this *Final Environmental Impact Statement/Report* (FEIS/R) pursuant to the *National Environmental Policy Act* (NEPA) and the *California Environmental Quality Act* (CEQA) for the proposed improvement of the South Access to the Golden Gate Bridge - Doyle Drive Project. This chapter describes the proposed action and the design alternatives that were developed by a multi-disciplinary team to achieve the project's purpose and need while avoiding or minimizing environmental impacts. The alternatives range from a replace and widen configuration to a parkway design. In addition, a No-Build Alternative is also considered.

2.1 Project Area

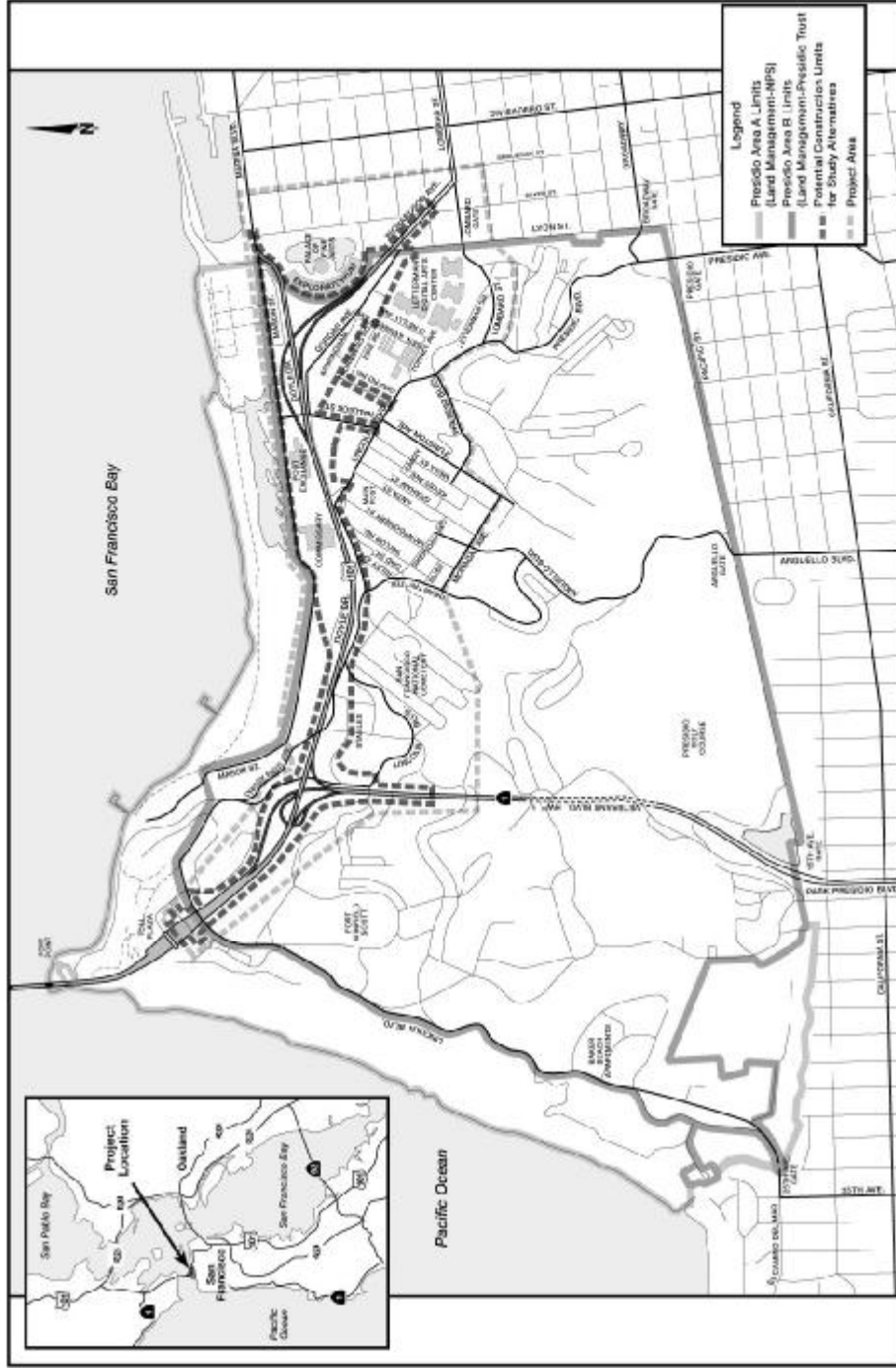
Doyle Drive is 2.4 kilometers (1.5 miles) long and is the southern approach of Route 101 to the Golden Gate Bridge. Built in 1936, Doyle Drive is a critical link for traveling to and from the San Francisco Peninsula and the North Bay. The Doyle Drive Project extends, on the west, from the Golden Gate Bridge Toll Plaza to Broderick Street on the east, and includes Richardson Avenue, Gorgas Avenue and Marina Boulevard. The project area was established to encompass the extent of potential project alternatives.

On the eastern end of the project area, access to Doyle Drive is provided via two approaches: one beginning at the intersection of Marina Boulevard and Lyon Street and the other at the intersection of Richardson Avenue and Lyon Street. Access is also provided where Veterans Boulevard (Route 1) connects to Doyle Drive - approximately 1.6 kilometers (one mile) west of the Marina Boulevard approach (see **Exhibit 2-1** on the following page).

2.2 Alternatives Development Process

In early 2000, the project team met with elected officials, planning and engineering staff, and community residents to discuss potential project alternatives and access options. Additionally, scoping meetings, open houses, and small community meetings were included in the alternatives development process (see Chapter 6 regarding public agency and Native American Tribal involvement for this environmental process). As a result of these meetings, screening criteria were developed to help evaluate alternatives and access options, based on the project's purpose and need.

**Exhibit 2-1
Doyle Drive Project Area and Potential Construction Limits**



2.2.1 Criteria for Screening of Alternatives

The criteria used in the screening process were based on the purpose and need for the Doyle Drive Project. They were developed in close coordination with federal cooperating agencies and other responsible agencies. The criteria were selected to represent environmental and community issues that could be assessed without more detailed study.

In general, the criteria considered the adequacy of the alternatives to meet regional and local transportation needs, minimize impacts to sensitive natural areas within the corridor, and maintain cultural resources and recreational qualities of the park. **Exhibit 2-2** presents the evaluation criteria used to screen and eliminate alternatives for the Doyle Drive Project.

Exhibit 2-2
Evaluation Criteria Used to Identify Alternatives

CATEGORY	GENERAL GOAL	SPECIFIC ELEMENT FOR EVALUATION
ENGINEERING AND TRAFFIC	<ul style="list-style-type: none"> ▪ Meet current design standards • Maintain the capacity and connectivity of each type of transportation network 	<p>Networks:</p> <ul style="list-style-type: none"> • Regional Transportation Network • City Transportation Network • Roadway Capacity
NATURAL RESOURCES	<ul style="list-style-type: none"> • Level of affect on restoration efforts and hydrology in each natural area 	<p>Natural Areas:</p> <ul style="list-style-type: none"> • Crissy Marsh and Field • Tennessee Hollow
CULTURAL RESOURCES	<ul style="list-style-type: none"> • Potential for retention, relocation, and removal of historic buildings, landscape features, streetscapes, cultural sites ▪ Relationship with existing cultural elements 	<p>Existing Cultural Elements:</p> <ul style="list-style-type: none"> • East Bluff Batteries • Cavalry Stables • Crissy Crescent • Native American Archaeological Sites • Gorgas Avenue • Halleck Street • Mason Street Warehouses • Historic Archaeological Sites • Montgomery Barracks/Main Post • Individual Historic Structures or Features • San Francisco National Military Cemetery • Mountain Lake Archaeology • Cultural Landscape

Source: *Doyle Drive Final Alternatives Report, 2000.*

2.2.2 Evaluation Process

The evaluation criteria for screening the Doyle Drive alternatives defined different qualitative levels of impact (high, medium or low level of effect) for each criterion. This process was used to screen preliminary alternatives for impacts or flaws that would make an alternative infeasible (“fatal flaws”). The remaining alternatives were analyzed in more detail and refined.

A final evaluation identified the alternatives for inclusion in this FEIS/R. The project’s purpose and need provided the foundation for all evaluation and alternative development. Community members and resource agencies participated in every step of this process. **Exhibit 2-3** presents an overview of this process, including the identification of the Preferred Alternative.

2.2.3 Techniques Used to Develop Preliminary Alternatives

The alternatives development process (including access options) followed an approach that was sensitive and responsive to community members, resource agencies, and cooperating agencies. Techniques used for alternative and access option development included context sensitive design solutions, sustainable design development, and other design refinements to avoid or minimize adverse impacts. The following discussion presents these techniques and how they were used for the Doyle Drive Project.

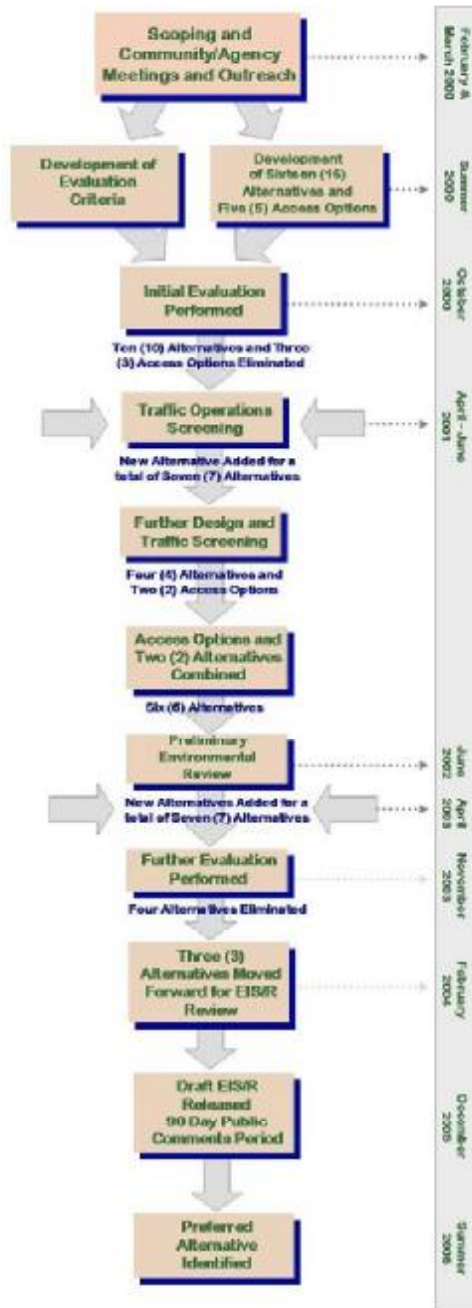
Context Sensitive Design/Solutions Approach

Context Sensitive Design (CSD) is the technique of creating public works projects that meet the needs of the users, the neighboring communities, and the environment. It integrates projects into the context or setting in a sensitive manner through careful planning, consideration of different perspectives, and tailoring designs to particular project circumstances.

The FHWA’s vision for context sensitive design/solutions (CSD/S) is a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. CSD/S is an approach that considers the total context within which a transportation improvement project will exist.

Caltrans uses “Context Sensitive Solutions” as an approach to planning, designing, constructing, maintaining, and operating its transportation systems. These solutions use innovative and inclusive approaches that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals. Context sensitive solutions are reached through a collaborative, interdisciplinary approach involving all stakeholders. The context of all projects and activities is a key factor in reaching decisions. It is considered for all State transportation and support facilities when defining, developing, and evaluating options. When

Exhibit 2-3
Evaluation Process Flowchart



considering the context, issues such as funding feasibility, maintenance feasibility, traffic demand, impact on alternate routes, impact on safety, and relevant laws, rules, and regulations are addressed.

Context Sensitive Design/Solutions and the Doyle Drive Project

One of the initial steps in the Doyle Drive Project was to assess the character of the project area. It was important to understand what was important about the site and to understand the needs of the surrounding community. In order to be sensitive to the project's environment, the project team considered its context and physical location carefully during the project planning stage. Additionally, a sizable planning effort had already taken place over the past decade involving residents and other stakeholders in the area. It assessed their needs and desires, and resulted in the publication of the 1993 Doyle Drive Task Force's, *Report of the Doyle Drive Task Force to the San Francisco Board of Supervisors*, the 1993 Caltrans' *Project Study Report: Doyle Drive Reconstruction*, and the 1996 San Francisco County Transportation Authority's *Doyle Drive Intermodal Study*. Scoping Meetings held in March 2000 also provided feedback from the public and agencies involved. Throughout this outreach and coordination process, the Doyle Drive Project alternatives and access options were developed with CSD/S in mind. By maintaining continued agency and stakeholder coordination, the project team was able to continually improve the design alternatives and address the goals of appearance, traffic calming, National Park setting, and pedestrian safety.

The visual simulation in **Exhibit 2-4** is an example of how CSD/S can be used to achieve the Doyle Drive Project's goals. Rich landscaping featuring native vegetation is used above the tunnel portals and on the retaining walls to integrate the facility into the park-like setting of the Presidio as well as retain the cultural relationship between the upper and lower portions of the Presidio. In addition, the wide openings along the tunnel portals enhance views for motorists and allow for more natural light at the tunnel entrances. The project will also enhance pedestrian and bicyclist safety by providing well defined pedestrian routes, incorporating pedestrian safety zones, and including well delineated bicycle lanes. Surface parking is provided along a two-way Palace Drive to emphasize its function as the primary access for the Palace of Fine Arts. The project team will continue to work on context sensitive design elements to improve how the eventual preferred alternative fits into the surrounding environment and meets the goals of the project within the context of the National Park setting and the natural environment.

Sustainable Design

Strategies for achieving sustainability were applied to alternatives development whenever possible. Sustainable Design is a systems approach to design and construction of a transportation (or any) facility that ensures consideration of ecological and human needs in light of well-grounded acceptable engineering and economic constraints.

Exhibit 2-4
Example of Context Sensitive Design/Solutions and the Doyle Drive Project



It has been the practice on this project to advance major project decisions through consensus. The Authority has established extensive agency coordination and public involvement procedures as a normal way of doing business. These procedures include agency and citizen working groups, key issues workshops, open houses, community meetings, stakeholder briefings, and project information materials such as newsletters, fact sheets, and a project website. The project team believes that the crafting of a sustainability policy statement and its implementation ought to be done through the same consensus process.

As important as a sustainability policy statement might be, a policy statement alone does not achieve sustainability. There must be detailed implementation mechanisms. Most importantly, there must be ways of measuring success or failure. Achieving sustainability for the Doyle Drive Project will include the following elements:

- Sustainability Goals and Objectives – Develop a statement of sustainability policy to define the core goals and purpose of the sustainability program. Objectives would then be developed to provide specific criteria to determine how the goals would be achieved.

- Sustainability Strategies – Develop a list of potential sustainability strategies that could be incorporated into the design, construction and maintenance/operations phases of the project.
- Implementation Responsibilities – Establish responsibility for implementation of each sustainability strategy selected for the project, along with preparation of a detailed plan of action for implementing that strategy, including a budget and time frame.
- Monitoring Implementation – After the sustainability strategies have been selected, and concurrent with determining implementation responsibilities, the project team would develop a quality assurance plan for monitoring and documenting implementation of each sustainability strategy for every phase of the project.
- Assessing Outcomes - It is essential to determine to the fullest extent possible whether the sustainability strategies that have been implemented produce the outcomes expected.

Some specific examples of sustainability-related strategies to consider for the Doyle Drive Project could be:

- Use of recycled materials;
- Designing roadway alignments to enhance or preserve attractive views of the natural and built environments while affecting them minimally;
- Specify materials to make maximum use of locally available manufactured and natural materials that can meet life-cycle functional requirements; and
- Promote the use of self-sustaining vegetation to minimize maintenance needs (e.g., minimize need for fertilizers or herbicide).

Specific sustainability goals and techniques, as they relate to the Preferred Alternative, are discussed later in this Chapter. In addition, Chapter 6 presents more information about the Sustainability Workshops which have been held during this environmental process.

Project Design to Prevent or Reduce Impacts

The Doyle Drive Project has strived to create a project that reduces impacts to biological, cultural and natural resources, respects the project setting within a National Park, the National Historic Landmark District and surrounding neighborhoods, meets community needs, and provides a safer roadway. The project team, working with stakeholders, embraced the concept that decisions to protect human health and the environment can have the greatest success and cost effectiveness when applied early to the design and development of a project. Some specific goals that guided identification and development of alternatives and design options included:

- Conserve and improve natural ecosystems while protecting human health and well-being.
- Minimize depletion of natural resources.

- Develop and apply engineering solutions, while being cognizant of local geography, culture, and history.
- Actively engage communities and stakeholders in the development of engineering solutions.

By incorporating these goals into alternatives design, potential impacts to the human, physical, and biological environment were often avoided or minimized.

2.2.4 Preliminary Alternatives and Access Options Considered

The preliminary set of alternatives and access options ranged from little or no improvements to the roadway, to emphasizing transit improvements (such as high-occupancy vehicle (HOV) lanes), to rehabilitating or replacing the existing structures, to new facilities in a different location. Because Doyle Drive currently has limited vehicular access into the Presidio, additional access options were also identified and evaluated.

These preliminary alternatives were developed based on four general design and/or location scenarios. These scenarios were:

- do nothing (which means the project would not be implemented, only bi-annual inspections, regular maintenance and interim repairs would occur);
- rehabilitate the existing structure;
- build a new facility in a new location; and
- rebuild a facility in the same corridor (In Corridor Concept).

The In Corridor Concept was divided into four vertical alignment alternatives: elevated, at-grade, depressed, and tunnel. The project team recognized that rebuilding the facility would have a major impact on traffic circulation during construction. As such, two construction options for each of the four rebuild alternatives were evaluated. These construction options were to either detour Doyle Drive traffic on a temporary detour structure during construction, or phase construction to ensure that existing traffic be maintained within the corridor.

Each of the preliminary alternatives which were considered for this project are presented in **Exhibits 2-5** through **2-20** on the following pages.

Additional Preliminary Alternatives

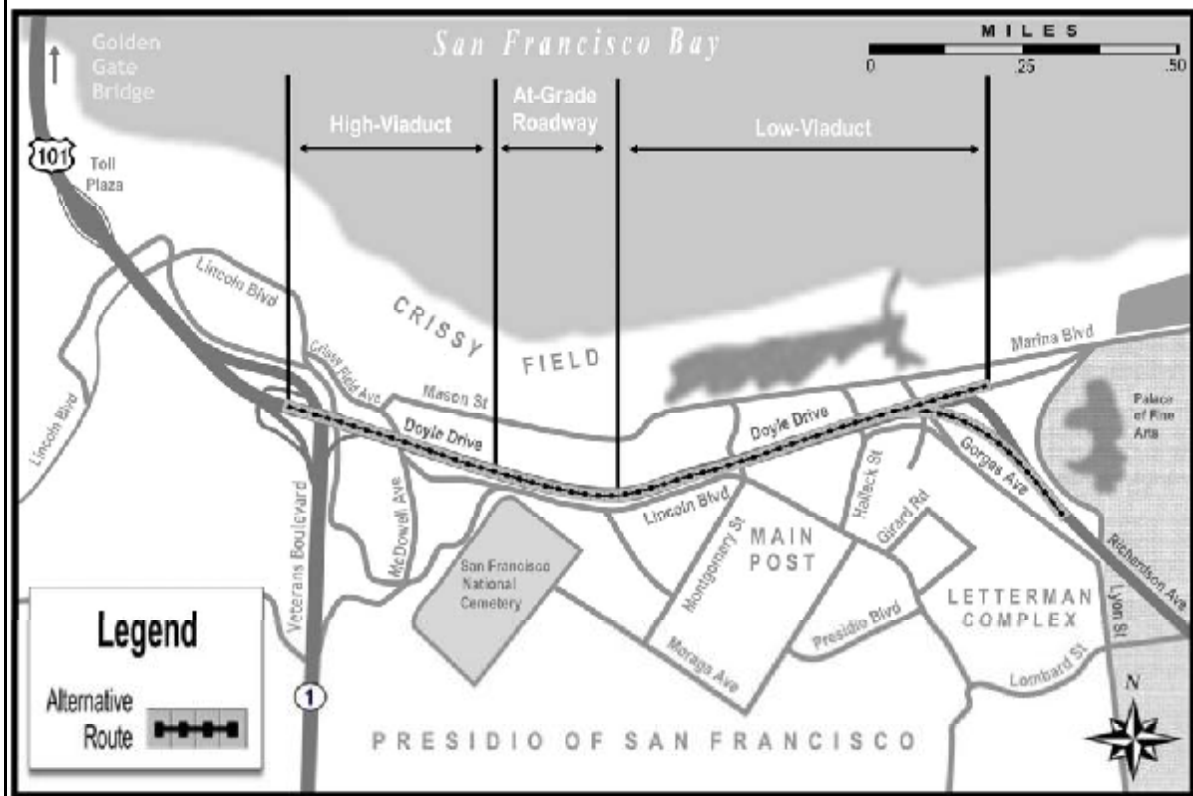
Two other preliminary build alternatives were introduced by the project team:

- The Couplet Alternative was developed during the alternative refinement process to maximize views of the Palace of Fine Arts and the Golden Gate Bridge from the roadway and to enhance pedestrian accessibility by separating southbound and northbound traffic.

- The Presidio Parkway concept was introduced in January 2003 to provide an alternative closer to the Parkway concept developed as part of the Doyle Drive Task Force (1993). The alternative introduced wide landscaped medians to emphasize the park-like setting and used two shallow tunnels to improve access across the Doyle Drive corridor. Halleck Street was raised over the tunnel portal to allow a low level causeway to pass over the area of possible marsh expansion.

For each of these concepts, access to the Presidio was to be provided via signalized intersections at an extension of Girard Road to Marina Boulevard. The Parkway Alternative also had several options, including two east-end Presidio access options, two Park Presidio Interchange options, and a slip ramp to Merchant Road.

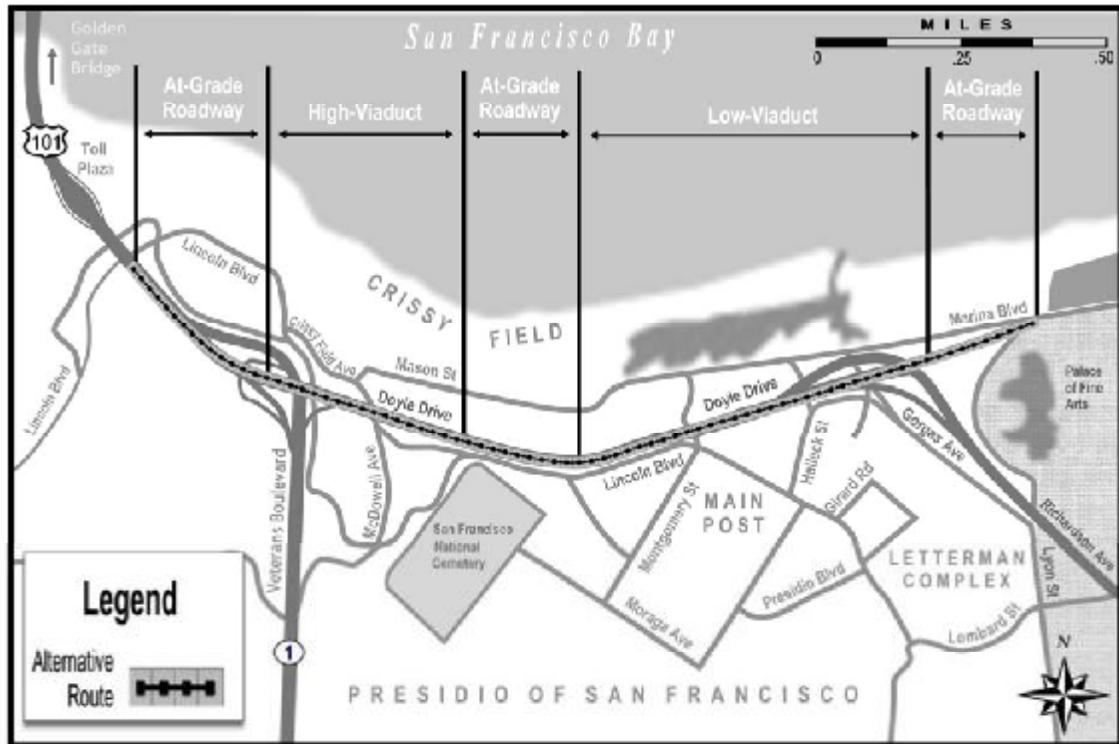
Exhibit 2-5
Retrofit without Widening



DESCRIPTION

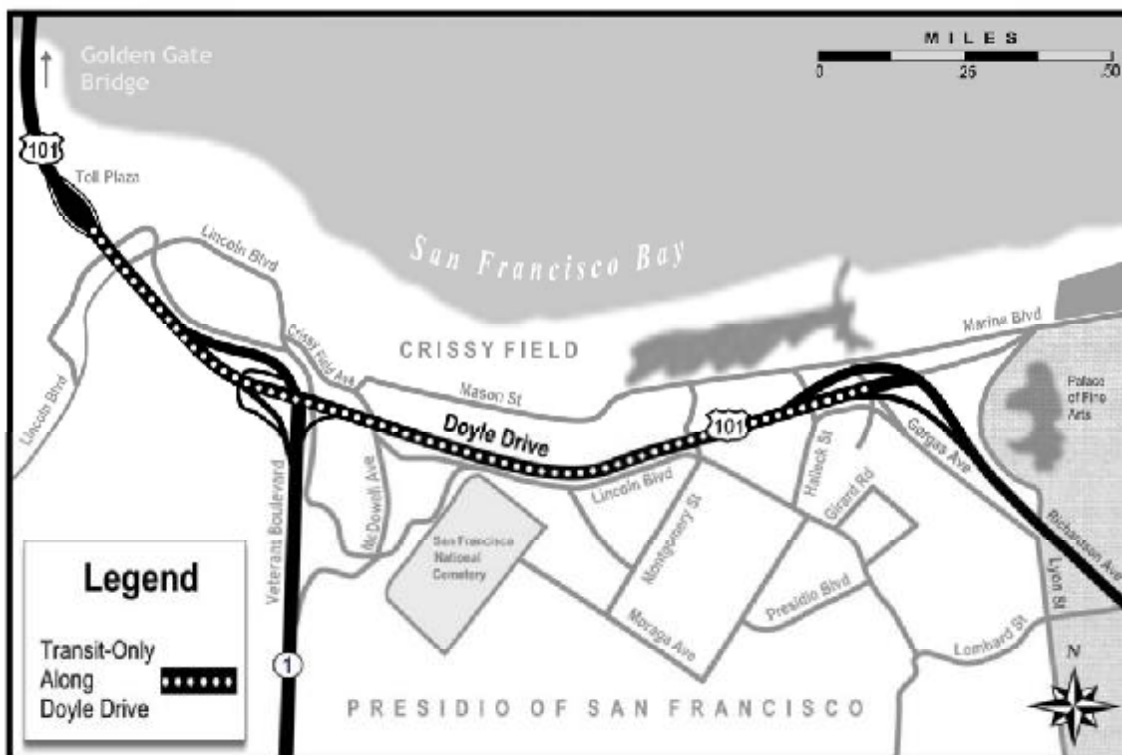
This alternative represented the transportation system management (TSM) improvement. It encompasses the maximum transportation system improvement that could be derived from relatively modest expenditures in the Doyle Drive corridor. The intent of the improvements in this alternative was to improve seismic and structural safety and extend the life of the existing facility as much as possible with minimal improvements.

**Exhibit 2-6
Retrofit with Widening Alternative**



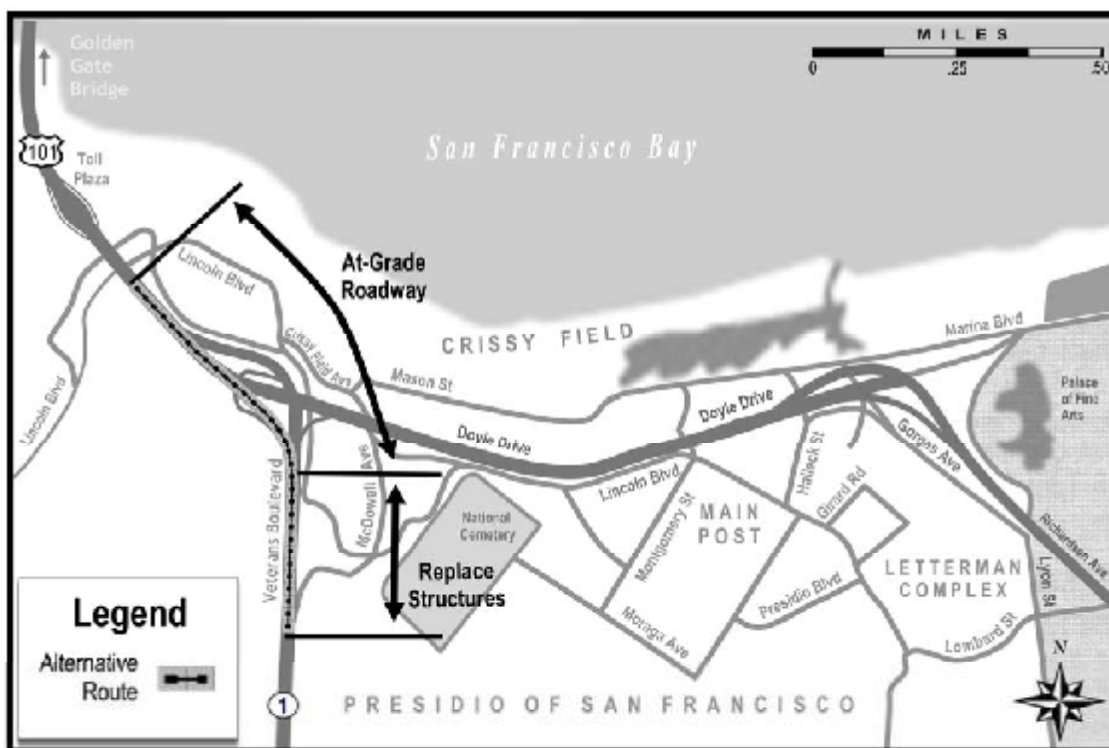
DESCRIPTION
<p>The possibility of retrofitting and widening the existing high- and low-viaducts was considered. Retrofit could include one of two approaches: either rehabilitate the existing structures or replace the existing structures completely.</p>
<p>This alternative was carried forward as Alternative 2, Replace and Widen.</p>

Exhibit 2-7
Transit Exclusive Alternative



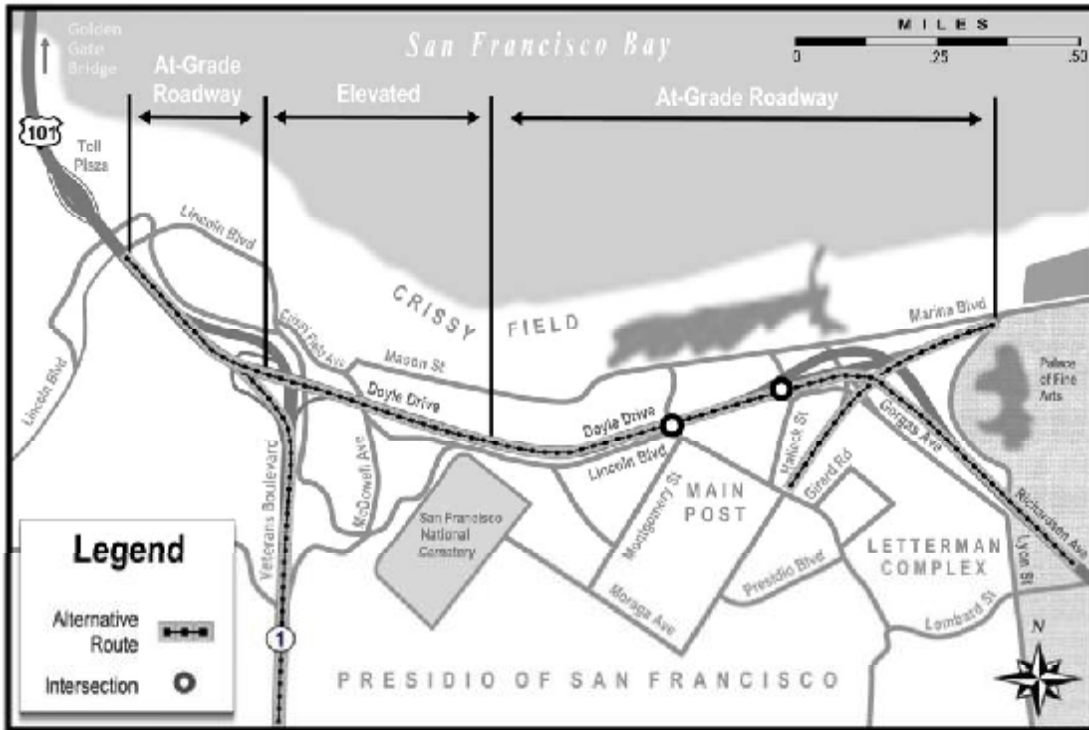
DESCRIPTION
<p>This alternative would have modified the existing Doyle Drive roadway for transit use only (buses and/or light rail vehicles). No provisions would be made to retain Doyle Drive's current function serving non-transit vehicles.</p>

Exhibit 2-8
Veterans Boulevard (Highway 1) Alternative



DESCRIPTION
<p>This alternative was developed by NPS staff to reduce potential impacts to resources in the Doyle Drive corridor by providing access between the Golden Gate Bridge and San Francisco via Highway 1 (Veterans Boulevard) with local access to the Presidio. Veterans Boulevard between the Golden Gate Bridge and Geary Street would be widened to accommodate both Veterans Boulevard and Doyle Drive traffic and redesignated as US 101.</p>

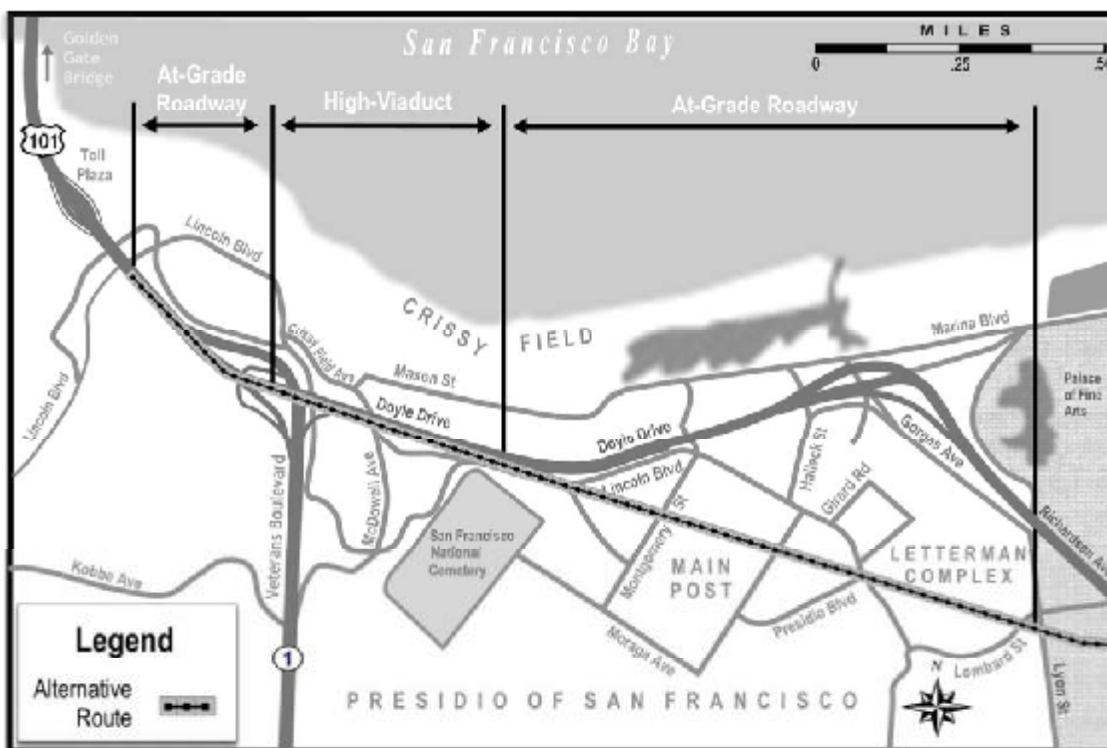
Exhibit 2-9
Doyle Drive Boulevard Alternative



DESCRIPTION

This alternative was developed by Presidio Trust planners to provide an at-grade facility between the National Cemetery and Richardson Avenue. Marina Boulevard and Girard Road would be extended to create a new at-grade intersection with access to the Presidio near the Letterman Complex. In addition, a new at-grade intersection at Bank Street would provide access to the Main Post, and a new at-grade intersection at Halleck Street would provide cross-access between Mason Street and the Main Post. Veterans and Geary Boulevards could be improved to accommodate some Doyle Drive traffic to facilitate the use of at-grade intersections.

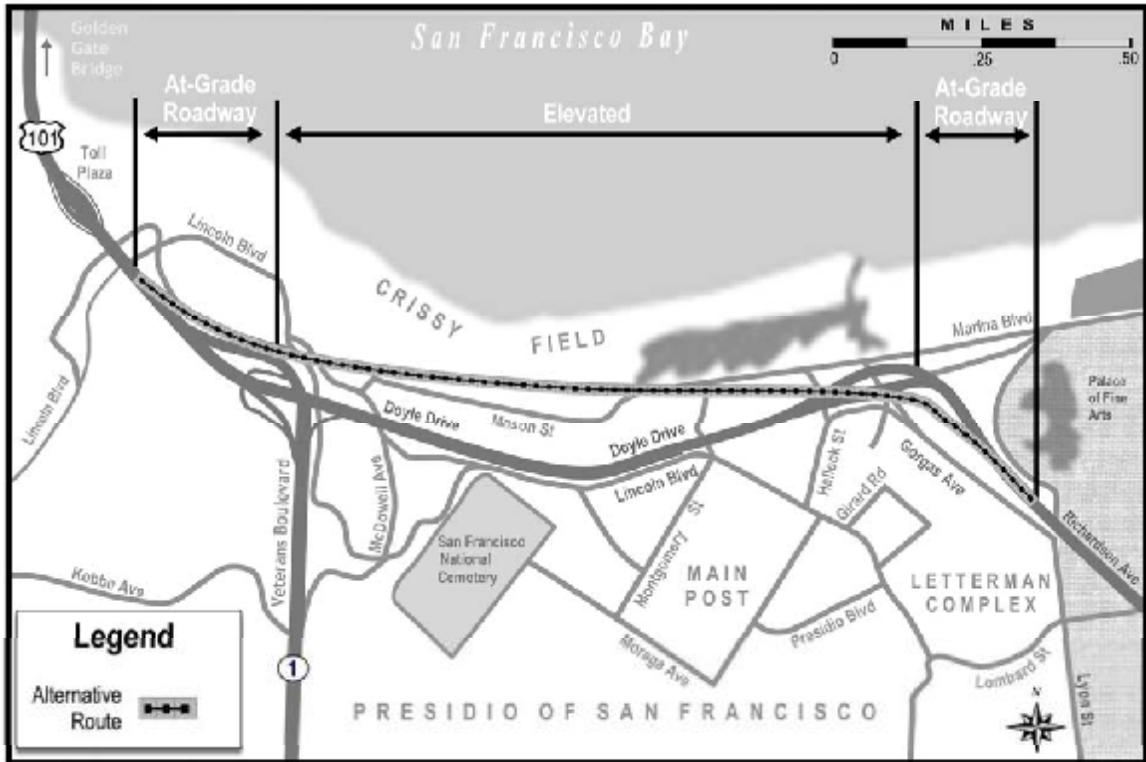
Exhibit 2-10
Lombard to Lincoln Alternative



DESCRIPTION

The Lombard to Lincoln Alternative would include the construction of a new at-grade facility south of existing Doyle Drive crossing the Presidio at a diagonal with no curves through the Main Post and the Letterman Complex to connect directly to Lombard Street.

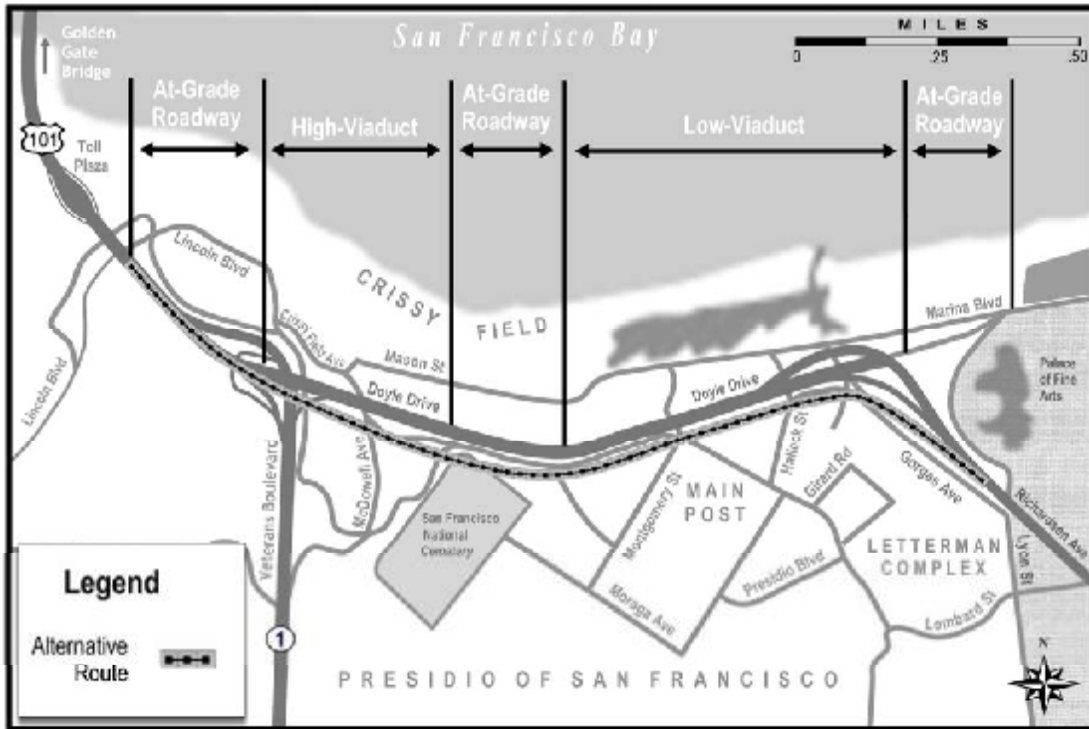
Exhibit 2-11
North of Corridor Alternative



DESCRIPTION

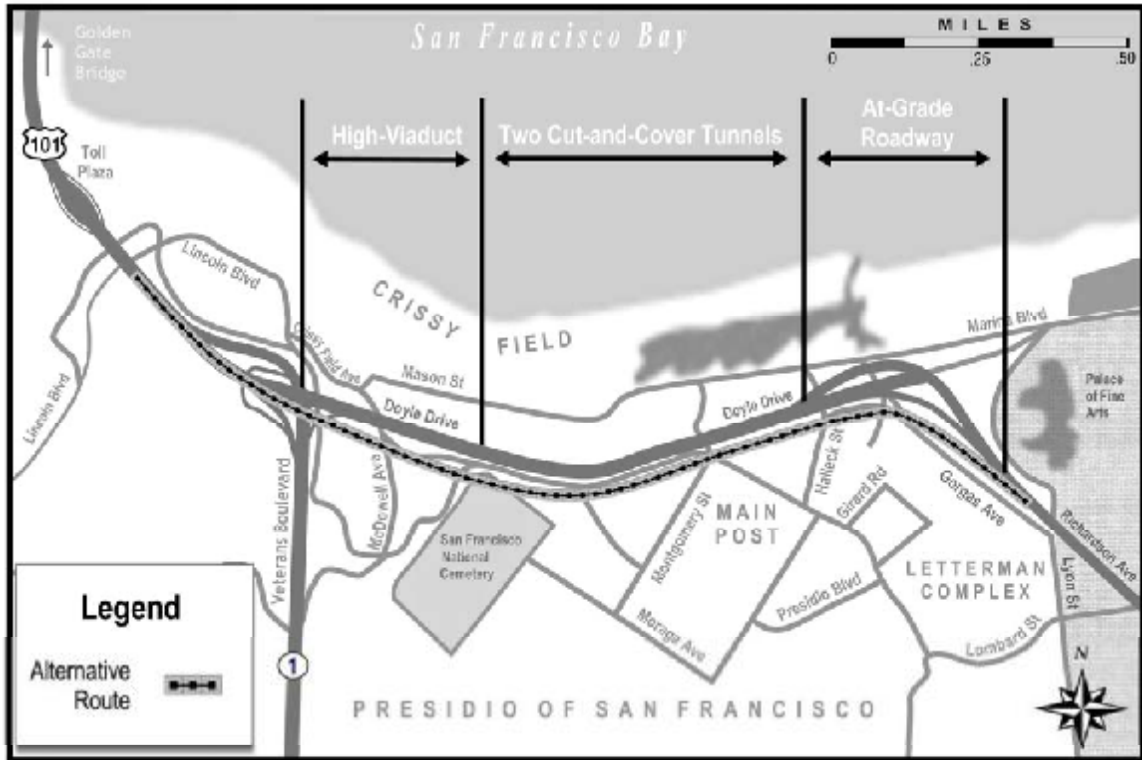
The North of Corridor Alternative would include a new, elevated facility located north of existing Doyle Drive that would cross through the center of Crissy Field to align with the Palace of Fine Arts Dome.

**Exhibit 2-12
In Corridor - Phased Construction Alternative: Elevated**



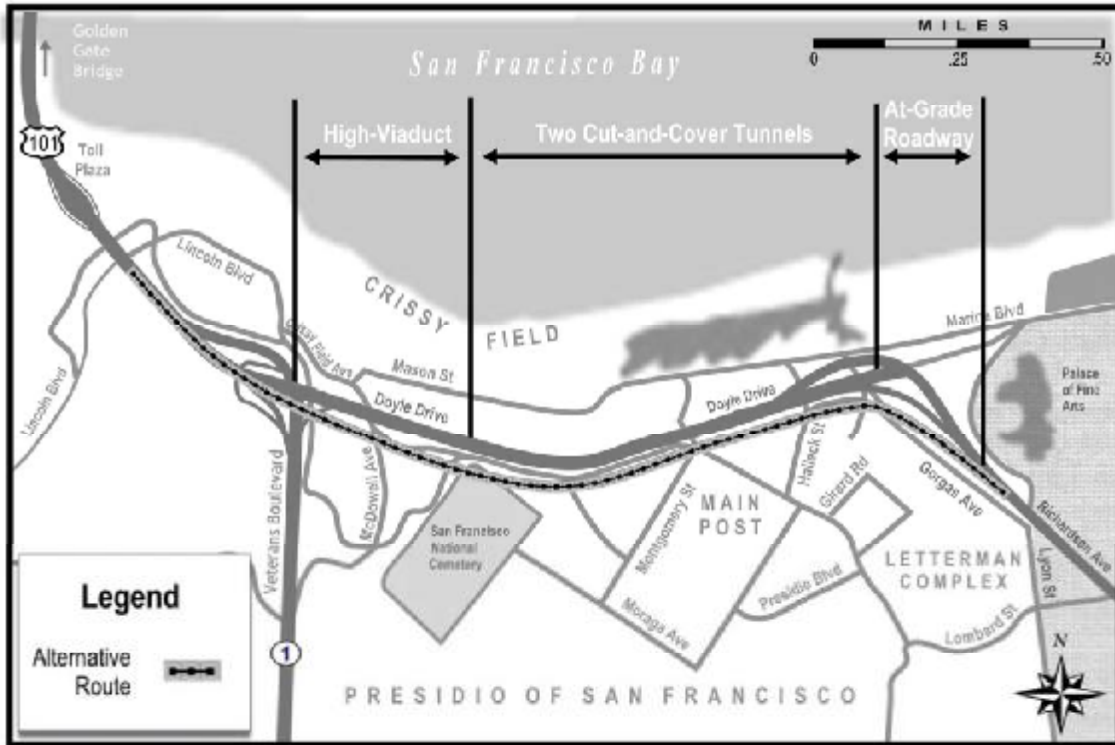
IN CORRIDOR - PHASED CONSTRUCTION ALTERNATIVE	
<p>The In Corridor – Phased Construction Alternative would replace the existing facility with a new six- or seven-lane facility with a fixed median barrier wall and shoulders as well as direct access to and from the Presidio between Halleck Street and Girard Road. The new facility would be located south of the existing structure for its full length to facilitate the maintenance of traffic on the existing facility throughout construction.</p>	
PRELIMINARY ALTERNATIVE	DESCRIPTION
ELEVATED	The elevated profile would be constructed at basically the same elevation and in the same configuration as the existing facility and would include both a high- and low-viaduct section.

Exhibit 2-13
In Corridor - Phased Construction Alternative: At-Grade



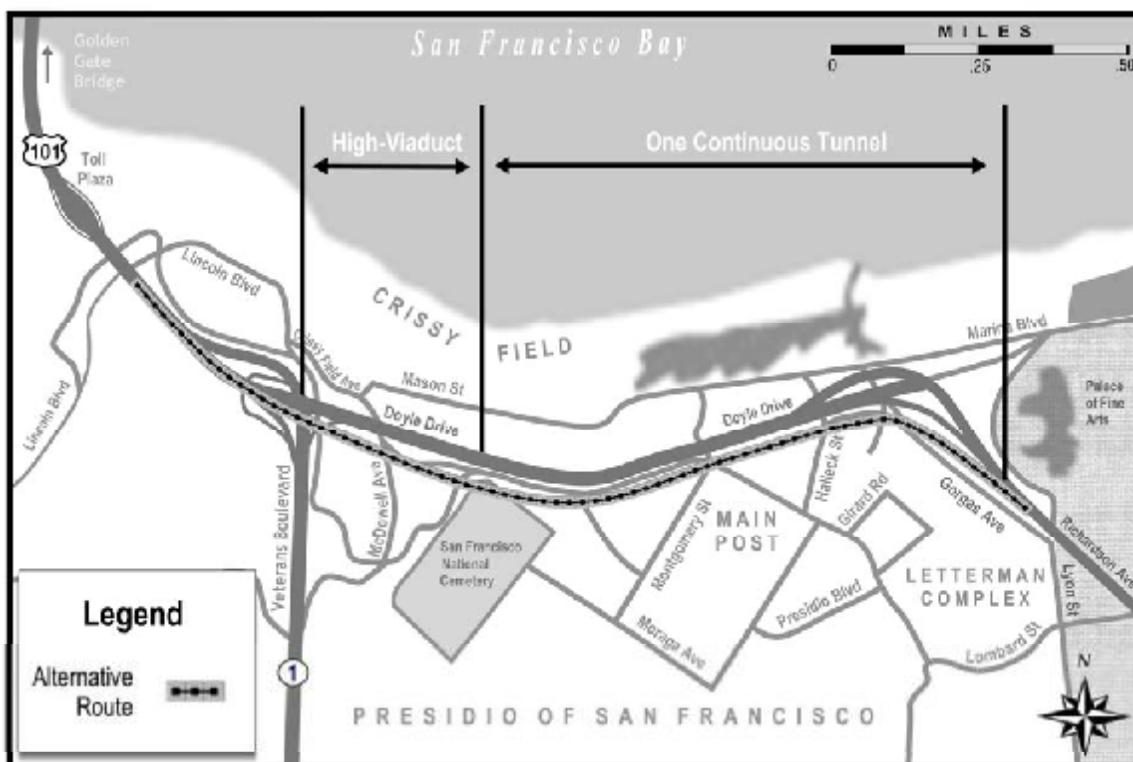
IN CORRIDOR - PHASED CONSTRUCTION ALTERNATIVE	
<p>The In Corridor – Phased Construction Alternative would replace the existing facility with a new six- or seven-lane facility with a fixed median barrier wall and shoulders as well as direct access to and from the Presidio between Halleck Street and Girard Road. The new facility would be located south of the existing structure for its full length to facilitate the maintenance of traffic on the existing facility throughout construction.</p>	
PRELIMINARY ALTERNATIVE	DESCRIPTION
AT-GRADE	<p>The at-grade profile would include a high-viaduct section between the Park Presidio Interchange and the National Cemetery, two cut-and-cover tunnels (as proposed in the previous planning studies) between the National Cemetery and the vicinity of the Main Post parade ground. The profile would then rise up to facilitate an elevated crossing over Halleck Street, the proposed Tennessee Hollow restoration, and the Marina access roadway, then go back down to meet the existing ground near the Palace of Fine Arts.</p>
<p>This alternative was carried forward as Alternative 7, Phased Construction, Bridge over Halleck.</p>	

Exhibit 2-14
In Corridor - Phased Construction Alternative: Depressed



IN CORRIDOR - PHASED CONSTRUCTION ALTERNATIVE	
<p>The In Corridor – Phased Construction Alternative would replace the existing facility with a new six- or seven-lane facility with a fixed median barrier wall and shoulders as well as direct access to and from the Presidio between Halleck Street and Girard Road. The new facility would be located south of the existing structure for its full length to facilitate the maintenance of traffic on the existing facility throughout construction.</p>	
PRELIMINARY ALTERNATIVE	DESCRIPTION
DEPRESSED	<p>The depressed profile would be the same as the at-grade profile until it reaches the vicinity of the Main Post parade ground where the profile would then continue down to pass under Halleck Street and the Marina access roadway. The profile would then rise to meet existing ground in the vicinity of Lyon Street.</p>

**Exhibit 2-15
In Corridor - Phased Construction Alternative: Tunnel**



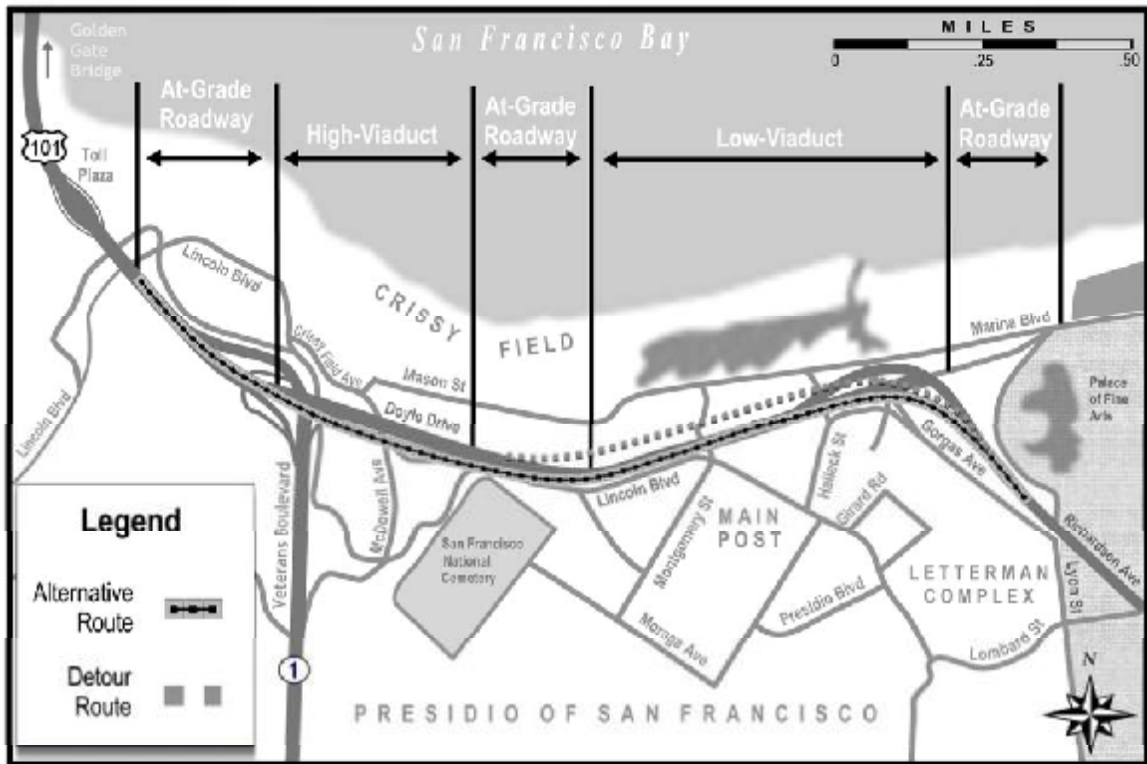
IN CORRIDOR - PHASED CONSTRUCTION ALTERNATIVES

The In Corridor – Phased Construction Alternative would replace the existing facility with a new six- or seven-lane facility with a fixed median barrier wall and shoulders as well as direct access to and from the Presidio between Halleck Street and Girard Road. The new facility would be located south of the existing structure for its full length to facilitate the maintenance of traffic on the existing facility throughout construction.

PRELIMINARY ALTERNATIVE	DESCRIPTION
TUNNEL	The tunnel profile would include a high-viaduct section between the Park Presidio Interchange and the National Cemetery and continue down to provide one, continuous tunnel between the National Cemetery and the vicinity of the Palace of Fine Arts. The tunnel section would pass under Halleck Street, the future Tennessee Hollow restoration, and the Marina access roadway that would be at-grade.

This alternative was carried forward as Alternative 6, Phased Construction, Tunnel Under Halleck.

Exhibit 2-16
In Corridor - Detour Construction Alternative: Elevated

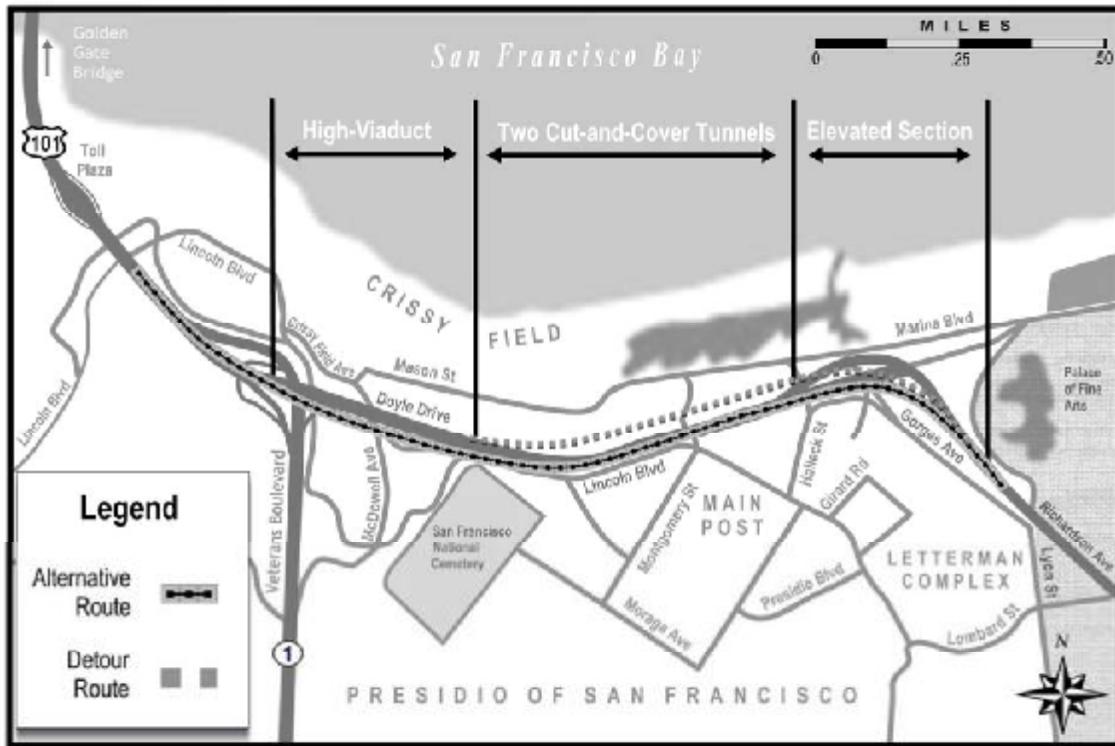


IN CORRIDOR - DETOUR CONSTRUCTION ALTERNATIVE

This alternative would include replacing the existing facility with a new six- or seven-lane facility with a fixed median barrier wall and shoulders as well as direct access to and from the Presidio between Halleck Street and Girard Road. The new facility would overlap existing Doyle Drive east of the National Cemetery. The new high-viaduct structure would be located south of the existing structure and a temporary detour facility would be constructed to the north to accommodate Doyle Drive traffic during construction of the replacement facility.

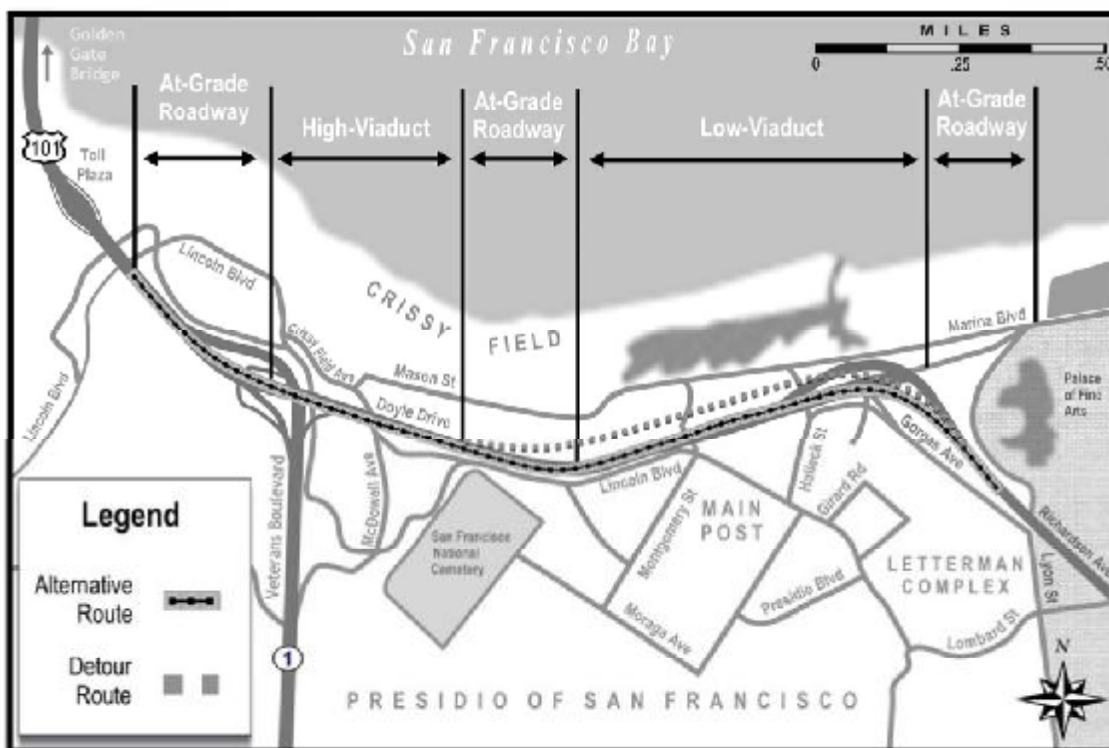
PRELIMINARY ALTERNATIVE	DESCRIPTION
ELEVATED	The elevated profile would be constructed at basically the same elevation and in the same configuration as the existing facility and would include both a high- and low-viaduct section.

Exhibit 2-17
In Corridor - Detour Construction Alternative: At-Grade



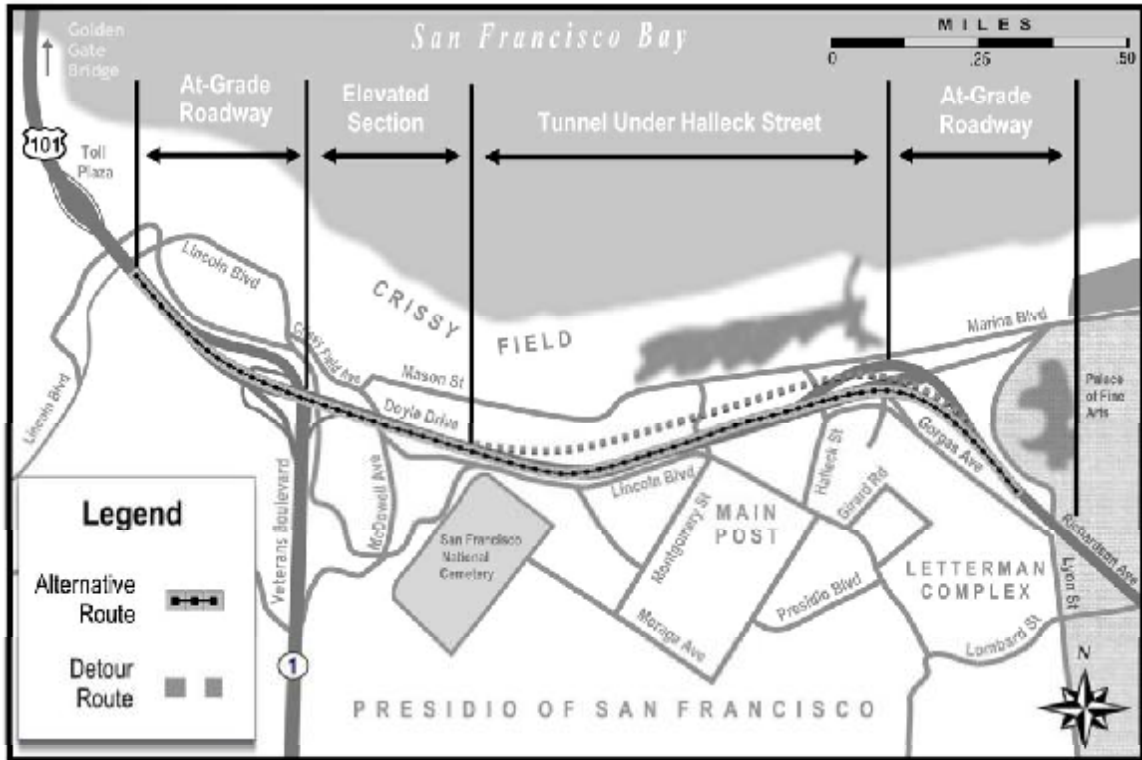
IN CORRIDOR - DETOUR CONSTRUCTION ALTERNATIVE	
<p>This alternative would include replacing the existing facility with a new six- or seven-lane facility with a fixed median barrier wall and shoulders as well as direct access to and from the Presidio between Halleck Street and Girard Road. The new facility would overlap existing Doyle Drive east of the National Cemetery. The new high-viaduct structure would be located south of the existing structure and a temporary detour facility would be constructed to the north to accommodate Doyle Drive traffic during construction of the replacement facility.</p>	
PRELIMINARY ALTERNATIVE	DESCRIPTION
AT-GRADE	<p>The at-grade profile would include a high-viaduct section between the Park Presidio Interchange and the National Cemetery, two cut-and-cover tunnels (as proposed in the previous planning studies) between the National Cemetery and the vicinity of the Main Post parade ground. The profile would then rise to facilitate an elevated crossing over Halleck Street. The proposed Tennessee Hollow restoration, and the Marina access roadway then go back down to meet the existing ground near the Palace of Fine Arts.</p>
<p>This alternative was carried forward as Alternative 4, Detour Construction, Bridge over Halleck.</p>	

Exhibit 2-18
In Corridor - Detour Construction Alternative: Depressed



IN CORRIDOR - DETOUR CONSTRUCTION ALTERNATIVES	
<p>This alternative would include replacing the existing facility with a new six- or seven-lane facility with a fixed median barrier wall and shoulders as well as direct access to and from the Presidio between Halleck Street and Girard Road. The new facility would overlap existing Doyle Drive east of the National Cemetery. The new high-viaduct structure would be located south of the existing structure and a temporary detour facility would be constructed to the north to accommodate Doyle Drive traffic during construction of the replacement facility.</p>	
PRELIMINARY ALTERNATIVE	DESCRIPTION
DEPRESSED	The depressed profile would be the same as the at-grade profile until it reaches the vicinity of the Main Post parade ground where the profile would then continue down to pass under Halleck Street and the Marina access roadway. The profile would then rise to meet existing ground in the vicinity of Lyon Street.

Exhibit 2-19
In Corridor - Detour Construction Alternative: Tunnel



IN CORRIDOR - DETOUR CONSTRUCTION ALTERNATIVE	
<p>This alternative would include replacing the existing facility with a new six- or seven-lane facility with a fixed median barrier wall and shoulders as well as direct access to and from the Presidio between Halleck Street and Girard Road. The new facility would overlap existing Doyle Drive east of the National Cemetery. The new high-viaduct structure would be located south of the existing structure and a temporary detour facility would be constructed to the north to accommodate Doyle Drive traffic during construction of the replacement facility.</p>	
PRELIMINARY ALTERNATIVE	DESCRIPTION
TUNNEL	<p>The tunnel profile also would include a high-viaduct section between the Park Presidio Interchange and the National Cemetery and continue down to provide one, continuous tunnel between the National Cemetery and the vicinity of the Palace of Fine Arts. The tunnel section would pass under Halleck Street, the future Tennessee Hollow restoration, and the Marina access roadway that would all be at-grade.</p>
<p>This alternative was carried forward as Alternative 3, Detour Construction, Tunnel under Halleck.</p>	

**Exhibit 2-20
Access Options Considered**

ACCESS OPTION	DESCRIPTION
Gorgas	Doyle Drive to Lombard Street connection via Gorgas Avenue.
Richardson	Doyle Drive to Lombard Street connection via Richardson Avenue.
Presidio	One new access in vicinity of Halleck Street/Girard Road or multiple new accesses in vicinity of Fort Point, Main Post and Crissy Field, Letterman Complex, and Palace of Fine Arts parking lot.
No Presidio	Eliminates the addition of new direct access in vicinity of Halleck Street.
Marina	Marina Boulevard approach.
No Marina	Eliminates Marina Boulevard approach.

2.3 Alternatives Considered and Withdrawn

Each alternative was developed to better meet the purpose and need of the Doyle Drive Project and to use as narrow a corridor as possible to minimize effects to environmental, historic, and community resources within the Presidio.

This refinement process focused on issues that were of concern to the general public, federal cooperating agencies, and CEQA responsible agencies. The refinement process also identified engineering design challenges. This was an iterative process that used additional studies, design workshops with project committees and working groups,¹ and coordination with agencies such as the National Park Service (NPS) and the Presidio Trust, to further refine the alternatives for analysis in the DEIS/R.

2.3.1 Eliminated During Initial Evaluation and Traffic Screening

Using the evaluation criteria, the initial alternatives and access options were evaluated. Based on the findings, the following alternatives and access options were withdrawn from further study:

Retrofit Without Widening (Minimal Improvements)

This alternative was withdrawn from further consideration because minimal improvements would not provide wider travel lanes, a median barrier, or shoulders; and would not meet the project's purpose and objectives of improving traffic safety.

¹ More information about these committees and working groups is presented in Chapter 6 of this document.

Transit Exclusive Alternative

This alternative was withdrawn from further consideration because Doyle Drive would no longer serve its current function as part of the local and regional transportation network and would not improve vehicular access to the Presidio; therefore, it would not meet the Doyle Drive Project's purpose and objectives.

Veterans Boulevard (Highway 1) Alternative

This alternative was withdrawn from further consideration because a substantial amount of right of way to provide space for a total of 18 lanes at the Geary Boulevard and Veterans Boulevard intersection and a total of 11 lanes at the California Street and Veterans Boulevard intersection would be needed to accommodate improved intersections, affecting both parkland and residential properties. Additional right of way would also be needed along the Geary Boulevard corridor from commercial and residential properties to accommodate the increase in lanes. However, even with the increased number of lanes, the intersections of Veterans Boulevard at both California Street and Geary Boulevard would operate at unacceptable service levels.

Doyle Boulevard Alternative

This alternative was withdrawn from further consideration because the Doyle Boulevard intersections would require at least eight lanes to accommodate the turning volumes and increasing the width of the project footprint by 7.2 meters (24 feet) that would affect historic and aesthetic resources in this area. The increase in congestion of Doyle Drive would increase the volume of cut-through traffic on local park roads. The Veterans Boulevard southbound approach to the California Street and Geary Boulevard intersections would also require three additional approach lanes to accommodate double left turn lanes and an exclusive right turn lane. Additionally, the level of improvements which would be needed on Veterans and Geary Boulevard to sufficiently reduce demand on Doyle Drive were considered unreasonable.

Parallel Construction-Elevated Alternative

This vertical alignment was eliminated from further consideration because it had the potential to affect graves within the San Francisco National Military Cemetery. In addition, it would require the removal of historic Buildings 105 and 106 of the Montgomery Barracks, both integral and contributing structures to the National Historic Landmark District (see **Exhibit 1-2** for locations of these buildings).

Parallel Construction-Depressed Alternative

This vertical alignment was eliminated from further consideration because it would not accommodate the restoration of Tennessee Hollow to the more natural state of open hydrological flow included in the *General Management Plan Amendment* and it would limit pedestrian and bicycle access to overpass

structures. Pedestrians and bicycles crossing Doyle Drive could only cross at overpasses constructed to “bridge” the depressed roadway over the east tunnel.

Detour Construction-Elevated Alternative

This vertical alignment was eliminated from further consideration because it would require the removal of historic Buildings 105 and 106 of the Montgomery Barracks, both integral and contributing structures to the National Historic Landmark District (see **Exhibit 1-2**), and would take a portion of the San Francisco National Military Cemetery.

Detour Construction-Depressed Alternative

This vertical alignment was eliminated from further consideration because it would not accommodate the restoration of Tennessee Hollow to the more natural state of open hydrological flow included in the *General Management Plan Amendment* and it would limit pedestrian and bicycle access to overpass structures. Pedestrians and bicycles crossing Doyle Drive could only cross at overpasses constructed to “bridge” the depressed roadway or over the east tunnel.

Lombard to Lincoln Alternative

This alternative was eliminated from further analysis because it would require the removal of Buildings 4, 5, 34, 38, 102, and 103 on the Main Post, all of which are integral and contributing structures to the National Historic Landmark District (see **Exhibit 1-2**). In addition, it would require the taking of large amounts of parkland while destroying the relationship between the historic buildings and historic landscape features. It would also conflict with the Letterman Digital Arts Center. This alternative would also require a small portion of the National Cemetery, and would result in a dramatic change to the visual setting of the Presidio.

North of Corridor Alternative

This alternative was eliminated from further analysis because it would require the removal of two Laundress Quarter buildings on Crissy Crescent (see **Exhibit 1-2**), both of which are integral and contributing structures to the National Historic Landmark District. It would also destroy the relationship between the historic buildings and the landscape features. In addition, this alternative would take a substantial portion of the recently completed Crissy Field and wetland restoration area and conflict with possible expansion of Crissy Marsh.

Gorgas Access Option

This design option was withdrawn from further analysis because it would require the removal of historic buildings, warehouses, the historic gymnasium, and indoor pool along Gorgas Avenue, all of which are integral and contributing structures to the National Historic Landmark District. It would also destroy the relationship between the historic buildings and historic streetscape features. This alternative would conflict with the Letterman Digital Arts Center by removing

Gorgas Avenue as the primary internal vehicular and bicycle circulation road. Moving Doyle Drive south of the existing historic buildings would also degrade the National Historic Landmark District boundary.

No New Presidio Access Option

This option was withdrawn from further analysis because it was not consistent with the project's purpose or the *General Management Plan Amendment* and *Presidio Trust Management Plan's* objectives to improve direct intermodal or vehicular access to the Presidio.

No Marina Access Option

This design option was withdrawn from further analysis because it would result in additional traffic on Richardson Avenue and would hamper traffic operations. Changing traffic patterns would increase intrusion in the residential areas of Cow Hollow, Pacific Heights, and the Marina by increasing local traffic between Marina Boulevard and Richardson Avenue.

2.3.2 Alternatives and Access Options Eliminated After Further Review

Following selection of the initial alternatives and access options, alternatives were renamed and paired with the remaining access options. At this time, a new alternative (Detour Construction-Couplet) was also added. This resulted in seven alternatives (including the No-Build). Further analyses were then performed. Based on these analyses, additional alternatives were eliminated from further study.

Phased Construction Alternatives

All four phased construction alternatives were eliminated from further review following additional analyses and evaluations. The alternatives were:

- Tunnel (Alternative 6a, Phased Construction, Tunnel under Halleck – Direct Marina Connector);
- Tunnel (Alternative 6b, Phased Construction, Tunnel under Halleck – Signalized Marina Connector);
- At-Grade (Alternative 7a, Phased Construction, Bridge over Halleck – Direct Marina Connector); and
- At-Grade (Alternative 7b, Phased Construction, Bridge over Halleck – Signalized Marina Connector).

The alignment requirements of these alternatives unavoidably put them under the northern portion of the National Cemetery. After much iteration, moving the alignment as far north as possible, the Parallel Construction Alternatives could not avoid placing the tunnel under 149 gravesites. Additional information from the Department of Veterans Affairs (VA) raised concerns about the uncertainty of the depth of the actual graves. There is a minimum depth to

structure of 5.5 meters (18 feet) below the existing ground line (from top of the tunnel to the existing ground line). The VA records do not clearly show the precise depths of the graves and in some cases, more than two graves were placed on top of each other making the depths of the graves greater than anticipated. Therefore, it could not be assured that a tunnel would not result in disinterment. In addition, these alternatives would have resulted in adverse impacts to historic Buildings 105, 106, 107, 108, 122, and 129 in the Main Post area (see **Exhibit 1-2**). The Parallel Construction Alternatives would have required longer construction durations, more complex traffic staging, and higher construction costs versus the detour construction alternatives. As a result, the Parallel Construction Alternatives were eliminated from further consideration.

Detour Construction-Couplet Alternative

Because the couplet would have additional adverse impacts over the tunnel alternatives to historic buildings on Gorgas Avenue and the National Historic Landmark District boundary, as well as traffic and noise impacts, it was dropped from further consideration.

Other Adjustments to Options and Alternatives

The original alternative "Retrofit with Widening" included two possibilities, either:

- Retrofit (Rehabilitate) and widen the existing structures; or
- Replace and widen the existing structures.

The possibility of rehabilitating and widening the existing high- and low-viaducts was withdrawn for numerous reasons. At the high-viaduct, the geometry of the substructure of the west approach precluded widening and required replacement of the entire west approach. The Sufficiency Rating based on Caltrans' biennial maintenance inspections indicated deterioration had compromised the ability of the gravity load carrying capacity of the structure as well as the lateral load carrying capacity (seismic safety) of the structure. The Retrofit by Rehabilitation and Widen Alternative cannot meet the seismic performance goals of the corridor given that the structure is designated as an "important route." The poor structural condition of the existing facility precluded rehabilitation; therefore the structure must be replaced to meet structural safety standards.

At the low-viaduct, the Retrofit by Rehabilitation and Widening Alternative is not a feasible option due to the fact that the existing structure cannot be retrofitted to meet Maximum Credible Earthquake design standards and as a result has been recommended for replacement prior to the year 2008.

The other option for the original alternative, Retrofit with Widening (by replacement), was renamed to Replace and Widen, and was carried forward for further evaluation.

2.3.3 Alternatives and Design Options Presented in the Preliminary Environmental Analysis and Withdrawn

Following completion of the preliminary environmental analysis in 2002, and development of a new alternative (Presidio Parkway), additional evaluations and analyses were performed. Estimated construction costs (in 2005 dollars) were also developed for these alternatives. **Exhibit 2-21** presents these construction costs. Current estimated construction costs of the project alternatives (in 2011 dollars) are presented in Section 2.7.

A public meeting was held in February 2004 to inform the public of the intent to drop Alternatives 3a, 3b, 4a, and 4b (described below) while adding the Presidio Parkway Alternative. The reasons for the decision were presented at the meeting. The public had an opportunity to talk with members of the project team about various aspects of the project and provide verbal and written comments. The project team also met with various neighborhood and stakeholder groups to present the decision to drop Alternatives 3a, 3b, 4a, and 4b and add the Presidio Parkway Alternative.

After additional analyses and evaluations, all four detour construction alternatives with single tunnels were eliminated from further review. The alternatives were:

- **Alternative 3a:** Detour Construction, Tunnel under Halleck, Direct Marina Access;
- **Alternative 3b:** Detour Construction, Tunnel under Halleck and Girard, Signalized Marina Connector;
- **Alternative 4a:** Detour Construction, Bridge over Halleck, Direct Marina Access; and
- **Alternative 4b:** Detour Construction, Bridge Over Halleck and Girard, Signalized Marina Connector.

Exhibit 2-21
Comparison of Construction Costs (in 2005 dollars)

ALTERNATIVE	ESTIMATED CONSTRUCTION COSTS
2: Replace and Widen	\$585,600,000
3a: Detour Construction, Tunnel under Halleck, Direct Marina Access	\$1,061,900,000
3b: Detour Construction, Tunnel under Halleck and Girard, Signalized Marina Connector	\$1,093,500,000
4a: Detour Construction, Bridge over Halleck, Direct Marina Access	\$804,300,000
4b: Detour Construction, Bridge Over Halleck and Girard, Signalized Marina Connector	\$797,7000
5: Presidio Parkway	\$701,200,000

While all four alternatives would have some impacts to historic buildings within the Presidio, the impacts as a result of the single tunnel alternatives would be more substantial. The single tunnel alternatives would permanently displace between six and eleven historic buildings, while the Presidio Parkway Alternative would displace between four and five historic buildings. The Replace and Widen Alternative would not permanently displace any historic buildings. In addition, only the Replace and Widen and the Presidio Parkway Alternatives would retain the historic Batteries Slaughter and Blaney, offer the greatest distance of the new structures from the Cavalry Stables area, and maintain (as opposed to lower) the elevation of the viaduct over Stilwell Hall. Neither the Replace and Widen nor the Presidio Parkway Alternatives would displace any of the Gorgas warehouses.

Alternatives 3a, 3b, and 4a require groundwater bypass systems to maintain the Tennessee Hollow hydrology due to the construction of tunnels in this area that would sever the natural hydrologic connections.

During construction of the single tunnel alternatives, the traffic capacity of the existing Doyle Drive facility would need to be maintained throughout the construction period, requiring a temporary detour structure. The detour structure would be built north of the existing facility to divert traffic away from the existing facility during construction. The detour structure, as part of Alternatives 3a, 3b, 4a and 4b, would increase the construction costs as well as the length of the construction period. The longer construction duration and more complex traffic staging associated with the tunnel alternatives would result in higher costs to construct, depending on the alternative selected. Construction length would be seven years as compared to four to five years with the Replace and Widen and Presidio Parkway Alternatives.

2.3.4 Various Design Elements

During the course of the alternative refinement process, several design elements were suggested by the public and resource agencies. The following presents some of the elements and discusses why they were not carried forward.

Lyon Street Portal

An extension of the tunnel with a portal at Lyon Street was also evaluated at the request of the NPS and the Presidio Trust to maximize reuse of parklands by placing Doyle Drive in a tunnel to the eastern edge of the Presidio. However, it was withdrawn from further analysis because this option would have required right of way from residential properties along Richardson Avenue and residents of the area strongly objected to a depressed tunnel approach and portal structure adjacent to their homes.

Tunnel Options

Several concepts were introduced during the alternative refinement process, including shifting the west tunnel portal west of the Park Presidio Interchange. This alternative was eliminated from further consideration because the lowering

of the roadway elevation would cross Cavalry Hollow at-grade, or require a berm in front of the historic stables creating an obstruction.

Another concept included a proposal for a split-level couplet (northbound lanes at-grade; southbound lanes in a tunnel). It was eliminated because the constrained area would require a depressed roadway approach adjacent to the at-grade roadway creating a visual and physical barrier with no additional benefits. Moving the “arms” of the Couplet Alternative north of Gorgas Avenue was also proposed to avoid isolating the Gorgas Avenue warehouses. However, this proposal was withdrawn from further consideration because it would have precluded sufficient queuing capacity for traffic on Girard Road, between the “arms,” and resulted in the removal of most of the parking for the Palace of Fine Arts.

Main Post Access

An option for use with the Retrofit and Widen Alternative was a southbound Doyle Drive off-ramp in the vicinity of the Main Post. This option was recommended by members of the Doyle Citizens Subcommittee. Both a southbound off-ramp and a northbound on-ramp were considered. Analysis indicated that the northbound on-ramp was not possible without additional adverse impacts to the historic batteries. Further traffic operational analysis indicated that the southbound off-ramp did not function operationally and was therefore eliminated.

Moveable Barrier

Early in the project, an extension of the moveable barrier proposed for the Golden Gate Bridge was considered as an option with Alternative 2, Replace and Widen. The intended benefits of the moveable barrier were a reduction in overall facility width as the center lane would be reversible to accommodate the peak traffic direction. However due to construction staging constraints identified as part of the design development, a width reduction could only be realized with the With Detour option and then only over a short section from the National Cemetery to the Main Post. Therefore, the moveable barrier was withdrawn from further consideration.

Intelligent Transportation Systems (ITS)

Where possible, ITS elements will be included with the project to meet the ITS requirements of Caltrans. ITS elements may include loop detectors, closed-circuit cameras, and changeable message signs. ITS elements will be clarified in Final Design and may be tied to the management of the tunnels.

Other Design Concepts

Other concepts included constructing a double-deck tunnel to provide parking above the roadway tunnel. This concept would require less fill; however, the Presidio Trust’s planning process is at an early stage and the feasibility of underground parking in the area of the Commissary is not known. Therefore,

this concept was eliminated. A three-level configuration was also proposed with the southbound tunnel under the northbound tunnel and with the underground parking level on top. However, there is insufficient space for the required tunnel approaches to meet existing ground at the eastern end without disrupting the Golden Gate Bridge Toll Plaza operations and at the western end without precluding future Tennessee Hollow restoration or extending well beyond the Presidio and into adjacent neighborhoods.

Because the Merchant Road Ramps located within the Golden Gate Bridge Toll Plaza area and the Richardson Slip Ramp are currently the only access point to the Presidio from Doyle Drive, the project team examined different access options at the east portion of the project corridor. A variety of configurations were considered for access to the Presidio and Marina Boulevard. They included separate access via direct left- or right-exit connectors to Marina Boulevard, a single southbound off-ramp to the Main Post, a Presidio intersection, a combined grade-separated Marina Boulevard/Presidio access with a roundabout, and a Single Point Urban Interchange (SPUI). A scheme to reverse circulation on Gorgas Avenue to avoid diverting traffic on Birmingham Road was also investigated. Except for the direct right exit connector and the diamond interchange, all of the access option refinements were eliminated from further consideration because they could not be constructed to current design standards without additional impacts to important historic resources, or they would result in traffic safety concerns, or they would not provide efficient traffic operations.

2.4 Alternatives for Further Study

Typically in an environmental analysis, two types of alternatives are analyzed – build alternatives (can range from one alternative to many alternatives) and a No-Build Alternative which means the project would not be built and the facility would remain as is. Bi-annual inspections, regular maintenance and interim repairs would occur. A No-Build Alternative represents the baseline. All other alternatives are compared to the No-Build. For this document, alternatives moved forward for further study included the No-Build Alternative and two Build Alternatives. Detailed drawings showing the plan and profile of each Build Alternative can be found in **Appendix B**. Alternatives were selected based on the purpose and need for this project – mainly to increase safety along Doyle Drive, with input from the scoping process and considering the principles of context sensitive design. As such, a discussion of capacity is not included in this discussion. Traffic volumes, level of service, and projections are presented in the Traffic and Transportation Section of this document (Chapter 3).

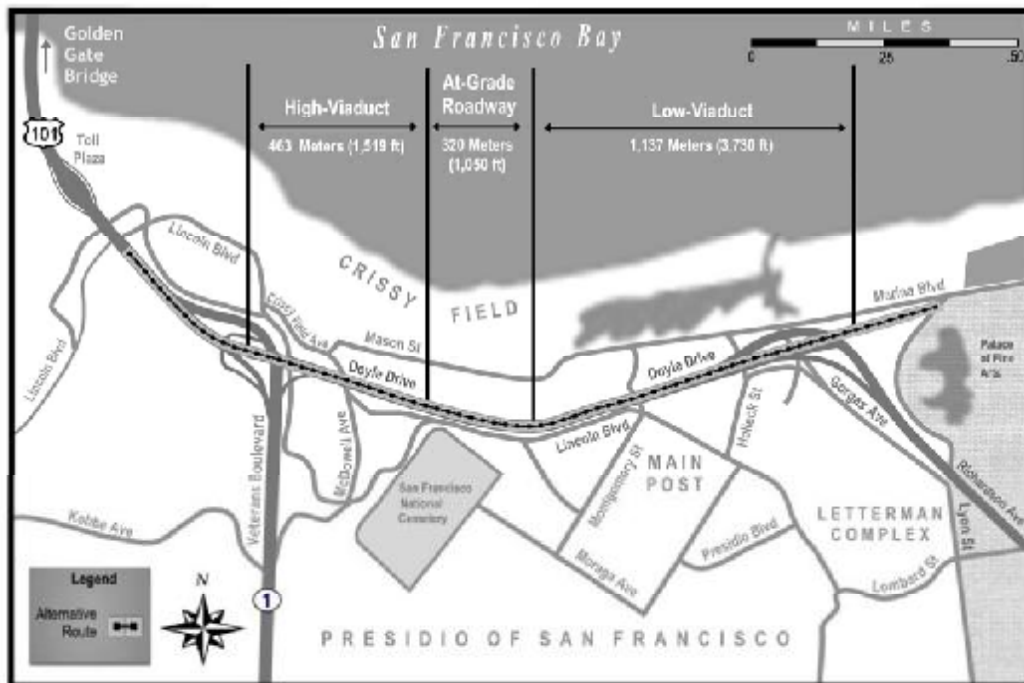
2.4.1 Alternative 1: No-Build

The No-Build Alternative (**Exhibits 2-22 through 2-24** on the following pages) represents the future year conditions if no other actions are taken in the study area beyond what is already programmed by the year 2020. It is the baseline condition against which all other alternatives are compared. Doyle Drive would remain in its current configuration (i.e., “No-Build”): 2.4 kilometers (1.5 miles) long with six traffic lanes ranging in width from 2.9 to 3 meters (9.5 to 10 feet) wide. There are no fixed median barriers or shoulders currently existing on Doyle Drive. The roadway passes through the Presidio on one high steel truss and one low elevated concrete viaduct with lengths of 463 meters (1,519 feet) and 1,137 meters (3,730 feet), respectively. This alternative considers those operational and safety improvements that have been planned and programmed to be implemented by the year 2020.

This alternative is required of all federal and state planning guidelines. The No-Build Alternative does not improve the seismic, structural, and traffic safety of the roadway.

The seismic retrofit of the high-viaduct that was completed in 1997 was performed presuming Doyle Drive would be replaced within ten years and did not address the issue of the deteriorated bridge decks that have reached the end of their useful life. Under the No-Build Alternative interim repairs would be required to maintain operations on the high-viaduct. The high-viaduct is

Exhibit 2-22
Alternative 1: No-Build



currently undergoing a rehabilitation that includes removal of existing paint, removal and replacement of in-kind various steel elements and connection rivets, replacement of deck joint seals, and repainting. These interim repairs are expected to maintain the current level of safety and do not constitute a retrofit or a full rehabilitation. This interim rehabilitation which was programmed for Fiscal Year (FY) 2005/6, started in September 2006 and is anticipated to be completed in November 2009. It is expected that ongoing maintenance would then be required to maintain the service load carrying capacity and safety of the facility to prevent it from being designated with a weight restriction. If the high-viaduct is designated with a weight restriction, buses and trucks will have to take alternate routes. However, it should be noted that the rehabilitation can only be considered a short-term solution merely delaying the eventual need for replacement of the entire high-viaduct structure.

The low-viaduct is unique in that the latest seismic retrofit completed in 1997 was installed with the condition that the bridge would be replaced within five to ten years because the seismic capacity of the bridge is limited. Limitations on capacity were imposed by the make-up of the structure, namely its type, materials, and its current state of deterioration. According to the State's risk analysis performed in 1998 (*Risk Assessment of Marina Viaduct*, Caltrans 1998), the latest seismic retrofit provides seismic capacity for an earthquake that has a five percent chance of being exceeded between the years of 1998 and 2008 and a 2.5 percent chance of being exceeded between the years of 1998 and 2003. It is expected that like the high-viaduct, interim repairs are likely to be made when recommended, at a minimum, by the biennial maintenance inspections.

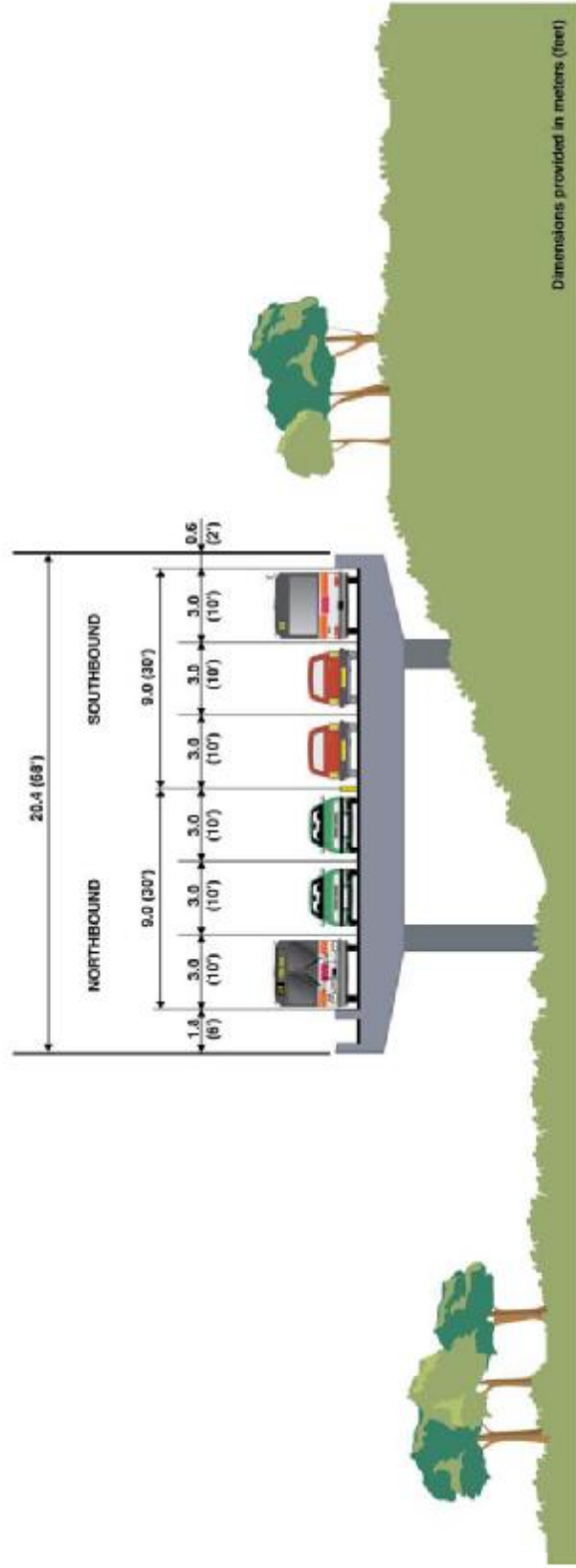
Vehicular access to the Presidio is available from Doyle Drive via the on- and off-ramps to Merchant Road at the Golden Gate Bridge Toll Plaza. This area is at the far western end of the Presidio, away from the developed area of the park. At the eastern end of Doyle Drive, Presidio access is provided for southbound traffic via a right turn from Richardson Avenue to Gorgas Avenue. Presidio access for northbound traffic is provided by the slip ramp from northbound Richardson Avenue to Gorgas Avenue.

Alternative 1 also includes programmed projects which are identified in the Metropolitan Transportation Commission's *Regional Transportation Plan*, 2005.

Exhibit 2-23
Alternative 1, No-Build: Plan



Exhibit 2-24
Alternative 1, No-Build: Typical Cross Section



Note: Landscaping shown for illustrative purposes only.

2.4.2 Alternative 2: Replace and Widen

The Replace and Widen Alternative, **Exhibits 2-25** through **2-27** (on the following pages), would replace the 463-meter (1,519-foot) long high-viaduct and the 1,137-meter (3,730-foot) long low-viaduct with new structures that meet the most current seismic and structural design standards. The height of the high-viaduct would vary (due to topography) from 20 to 35 meters (66 to 115 feet) above the ground surface.

The low-viaduct would have an average height of approximately ten meters (33 feet) for the No-Detour Option and approximately eight meters (26 feet) for the Detour Option. The new facility would be replaced on the existing alignment and widened to incorporate improvements for increased traffic safety.

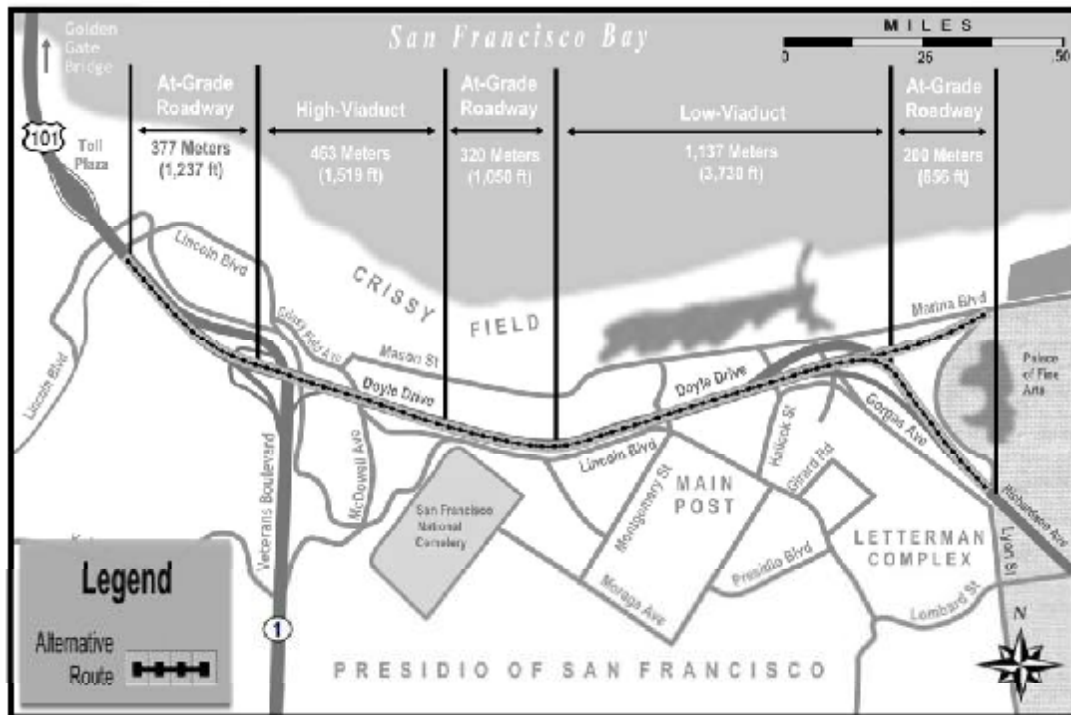
This alternative would include three 3.6-meter (12-foot) lanes in each direction with three-meter (ten-foot) outside and inside shoulders. In addition, the facility would include a 3.6-meter (12-foot) auxiliary lane in the southbound direction from the Park Presidio Interchange to the Richardson Avenue ramp. The new facility would have an overall width of 37.8 meters (124 feet). The new facility would require a localized northbound lane width reduction to 3.3 meters (11 feet) and inside shoulder reduction to 0.6 meters (two feet) to avoid impacts to the historic batteries which are remnants of the original Presidio coastal gun emplacements and Lincoln Boulevard, reducing the facility width to 32.4 meters (106 feet). This alternative would not preclude the Golden Gate Bridge Highway Transportation District's (GGBHTD) parking of the moveable median barrier machine in the median of Doyle Drive south of the Toll Plaza.

At the Park Presidio Interchange, the two ramps connecting southbound Doyle Drive to northbound Veterans Boulevard and the ramp connecting northbound Doyle Drive to southbound Veterans Boulevard would be reconfigured to improve traffic safety and accommodate the new facility. The Replace and Widen Alternative would operate similar to the existing facility except that there would be a median barrier and inside and outside shoulders to accommodate disabled vehicles. The Replace and Widen Alternative includes two options for the construction staging:

- **No-Detour Option** – The widened portion of the new facility would be constructed on both sides and above the existing low-viaduct and would maintain traffic on the existing structure. Traffic would be incrementally shifted to the new facility as it is widened over the top of the existing structure. Once all traffic is on the new structure, the existing structure would be demolished and the new portions of the facility would be connected. To allow for the construction staging using the existing facility, the new low-viaduct would be constructed two meters (seven feet) higher than the existing low-viaduct structure.

- **With Detour Option** - A 20.4-meter (67 foot) wide temporary detour facility would be constructed to the north of existing Doyle Drive to maintain traffic through the construction period. Access to Marina Boulevard during construction would be maintained on an elevated temporary structure south of Mason Street. On- and off-ramps for the mainline detour facility would connect to the existing Marina Boulevard/Lyon Street intersection.

Exhibit 2-25
Alternative 2: Replace and Widen

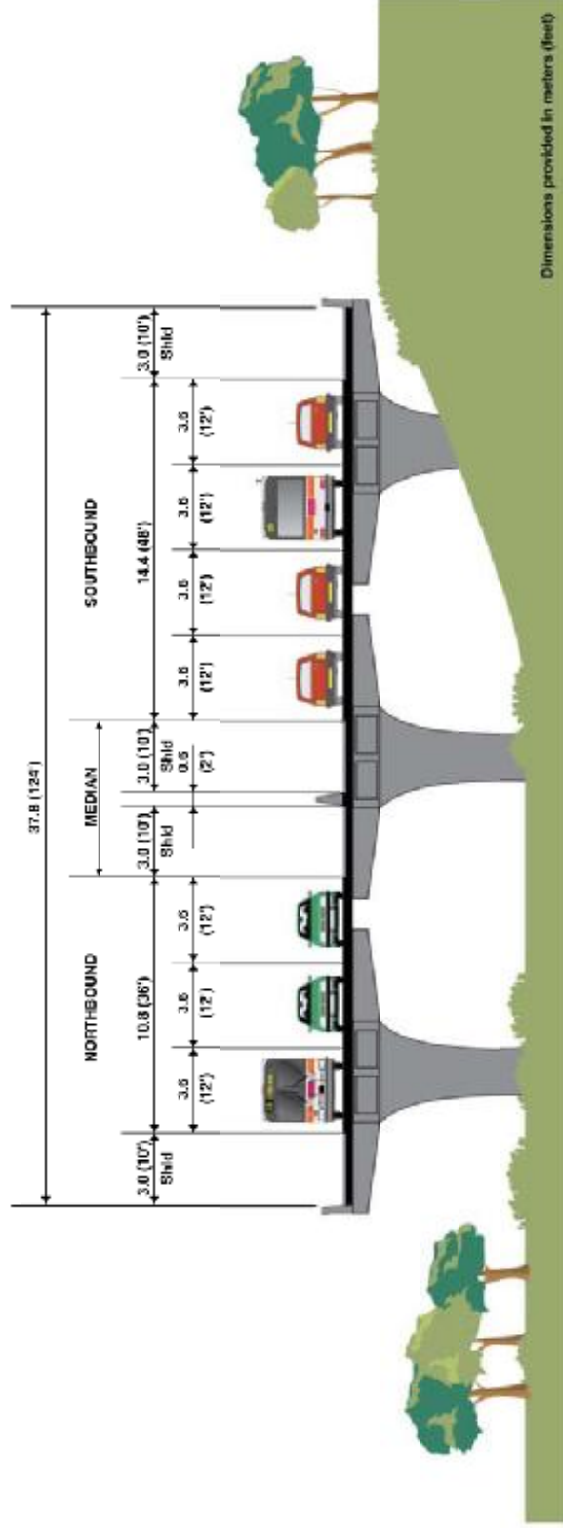


Vehicular access to the Presidio would be available from Doyle Drive via the on- and off-ramps to Merchant Road at the Golden Gate Bridge Toll Plaza. Access to Lincoln Boulevard and the Presidio from Merchant Road is via roads that service GGBHTD facilities such as its maintenance and administration buildings and visitor areas. Presidio access at the east end of the project would be provided for southbound traffic via a right turn from Richardson Avenue to Gorgas Avenue. The current Presidio access for northbound traffic at the east end of Doyle Drive cannot be accommodated due to geometric constraints and concerns for traffic safety.

Exhibit 2-26
Alternative 2, Replace and Widen: Plan



Exhibit 2-27
Alternative 2, Replace and Widen: Cross Section



Note: Landscaping shown for illustrative purposes only.

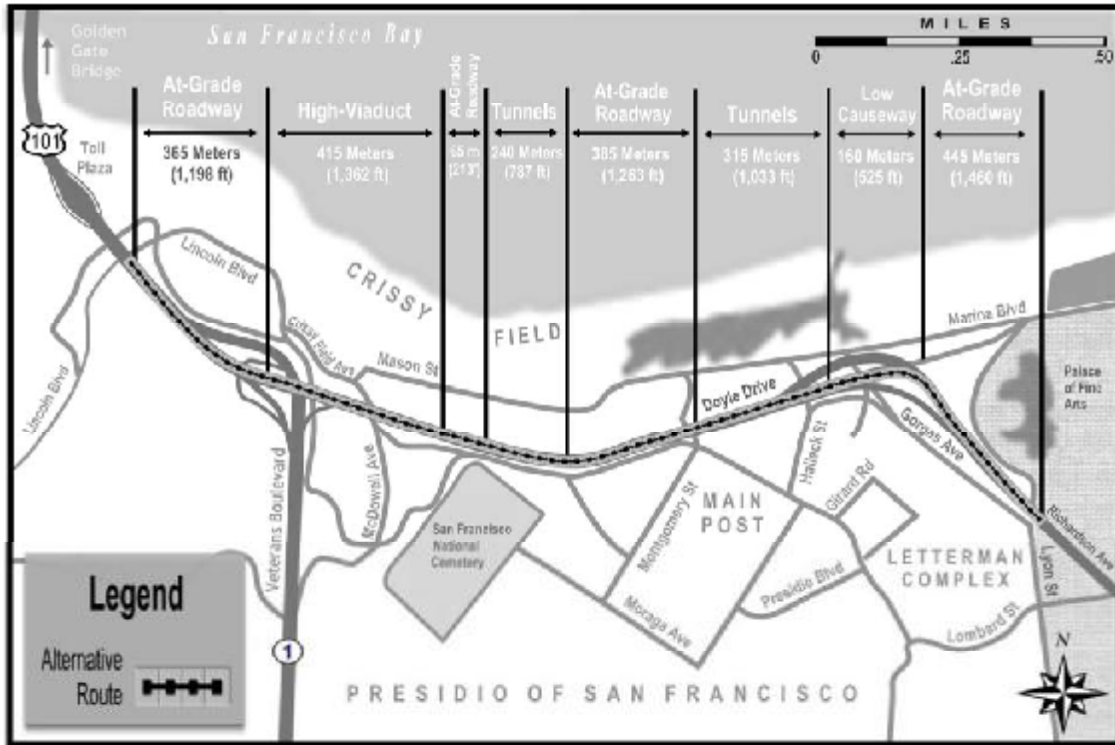
Retaining walls would be required at the Park Presidio Interchange to accommodate the ramp realignments. A retaining wall would also be constructed on the south side of the facility along the constrained section between the National Cemetery and the historic batteries.

2.4.3 Alternative 5: Presidio Parkway

The Presidio Parkway Alternative, shown in **Exhibits 2-28** through **2-30** (on the following pages) would replace the existing facility with a new six-lane facility and a southbound auxiliary lane, between the Park Presidio Interchange and the new Presidio access at Girard Road. The new facility would consist of two 3.3-meter (11-foot) lanes and one 3.6-meter (12-foot) outside lane in each direction with three-meter (10-foot) outside shoulders and 1.2-meter (4-foot) inside shoulders. In addition, a 3.3-meter (11-foot) auxiliary lane runs along southbound Doyle Drive from the Park Presidio Interchange to the Girard Road exit ramp. The total roadway width would be 32.1 meters (105.3 feet) and the overall facility width, including the median, would vary from 37.1 to 44.6 meters (121.7 to 146.3 feet). The width of the proposed landscaped median varies from five meters (16 feet) to 12.5 meters (41 feet). To minimize impacts to the park, the footprint of the new facility would include a large portion of the existing facility's footprint east of the Park Presidio Interchange. In some areas along the roadway, full restoration of mature natural species may take between 10 and 20 years.

A 415-meter (1,362-foot) long high-viaduct would be constructed between the Park Presidio Interchange and the San Francisco National Cemetery. The height of the high-viaduct would vary from 20 to 35 meters (66 to 115 feet) above the ground surface. Shallow cut-and-cover tunnels would extend 240 meters (787 feet) past the cemetery to east of Battery Blaney. The facility would then continue towards the Main Post in an open depressed roadway with a wide heavily landscaped median. This alternative would not preclude GGBHTD's parking of the moveable median barrier machine in the median of Doyle Drive south of the Toll Plaza.

Exhibit 2-28
Alternative 5: Presidio Parkway

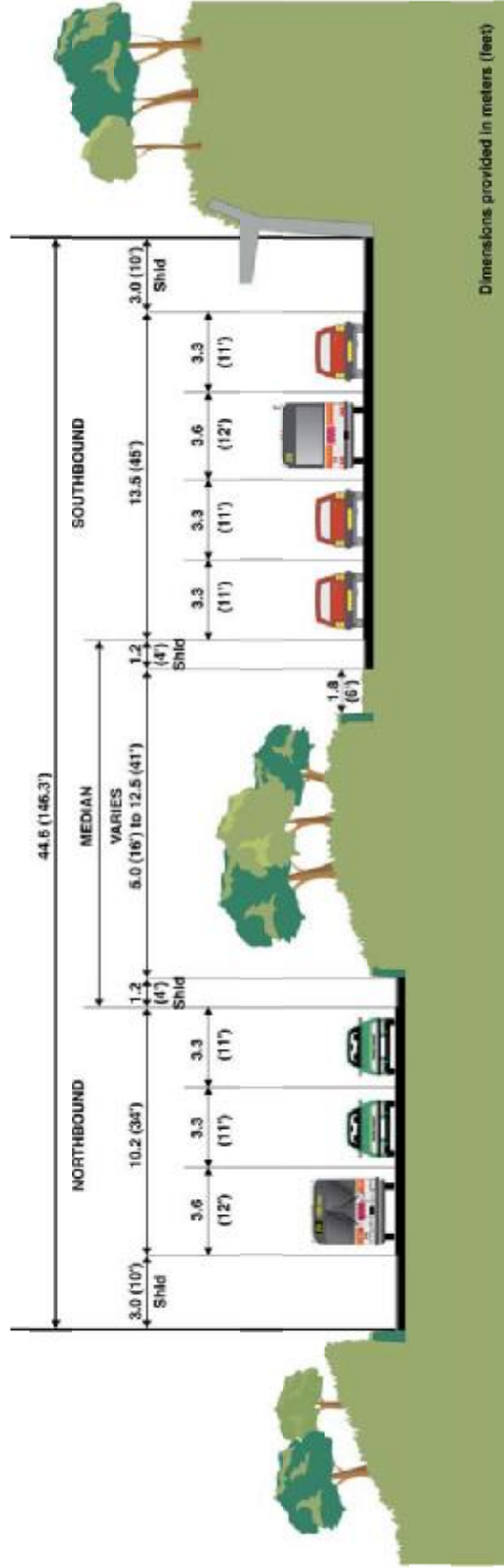


From Building 106 (Band Barracks) cut-and-cover tunnels up to 315 meters long (1,035 feet) would extend to east of Halleck Street. The amount of fill over the tunnels is being coordinated with the Presidio Trust based on requirements of the *Vegetation Management Plan*. The expected minimum depth is two meters (six feet). The facility would then rise slightly on a low causeway 160 meters (525 feet) long over the site of the proposed Tennessee Hollow restoration and a depressed Girard Road. The low causeway would rise to approximately four meters (13 feet) above the surrounding ground surface at its highest point. East of Girard Road the facility would return to existing grade north of the Gorgas warehouses and connect to Richardson Avenue. The proposed facility would provide a transition zone, starting from the Main Post tunnel, in order to reduce vehicle speeds prior to entering city streets. A motor control and switch gear room that would operate the tunnel life-safety equipment would be integrated with the Main Post tunnels.

Exhibit 2-29
Alternative 5, Presidio Parkway: Plan



Exhibit 2-30
Alternative 5, Presidio Parkway: Cross Section



Note: Landscaping shown for illustrative purposes only.

The Presidio Parkway Alternative would include an underground single-parking facility up to four meters (13 feet) deep at the eastern end level of the alignment between the Mason Street warehouses and the Gorgas Street warehouses. The parking garage would supply approximately 500 spaces to maintain the existing parking supply in the area and provide pedestrian and vehicular access between the Presidio and the Palace of Fine Arts.

At the intersection of Doyle Drive and Merchant Road, just east of the Toll Plaza, a design option has been developed for a Merchant Road Slip Ramp. This option would provide an additional new connection from northbound Doyle Drive to Merchant Road. This ramp would provide direct access to the Golden Gate Visitors' Center as well as the Presidio and alleviate the congested weaving section where northbound Veterans Boulevard merges into Doyle Drive.

Based on the realignment of Doyle Drive, the Park Presidio Interchange would be reconfigured. The exit ramp from southbound Doyle Drive to southbound Veterans Boulevard would be replaced with standard exit ramp geometry and widened to two lanes. The loop of the northbound Doyle Drive exit ramp to southbound Veterans Boulevard would be improved to provide standard exit ramp geometry. The northbound Veterans Boulevard connection to northbound Doyle Drive would be realigned to provide standard entrance ramp geometry. There are two options for the northbound Veterans Boulevard ramp to a southbound Doyle Drive connection:

- **Loop Ramp Option** - Replace the existing ramp with a loop ramp to the left to reduce construction close to the Cavalry Stables and provide standard entrance and exit ramp geometry.
- **Hook Ramp Option** - Rebuild the ramp with a similar configuration as the existing directional ramp with a curve to the right and improved exit and entrance geometry.

The Presidio Parkway Alternative includes two options for direct access to the Presidio and Marina Boulevard at the eastern end of the project:

- **Diamond Option** – Direct access to the Presidio and indirect access to Marina Boulevard in both directions is provided by the access ramps from Doyle Drive connecting to a grade-separated interchange at Girard Road. East of the new Letterman garage, Gorgas Avenue is a one-way street and connects to Richardson Avenue with access to Palace Drive via a signalized intersection at Lyon Street. Palace Drive would operate as a one-way road and would be separated from Lyon Street.
- **Circle Drive Option** – Direct access to the Presidio and indirect access to Marina Boulevard for southbound traffic by access ramps connecting to a grade-separated interchange of Girard Road. Northbound traffic from Richardson Avenue would access the Presidio through a jug handle intersection with Gorgas Avenue. Palace Drive would operate as a one-way road and would be separated from Lyon Street.

Included in both the Diamond and Circle Drive options are extended bus bays on both sides of Richardson Avenue which would accommodate up to four buses each. The extended bus bays would keep the buses out of the main flow of traffic during stops, provide safer merging capability for the buses and would facilitate transfers between Golden Gate Transit, Muni and PresidiGo vehicles. Improved crosswalks to provide safer and enhanced pedestrian circulation in the area would be provided.

Retaining walls would be required at the Park Presidio Interchange to accommodate the reconstruction of the ramps. A retaining wall up to eight meters (26 feet) would be constructed along the south side of the facility between the Battery and Main Post tunnels. Retaining walls would also be required in the eastern end of the alignment primarily along the extended Girard Road. Fences would be required along the edge of the at-grade portions of the roadway to restrict pedestrian access.

2.5 Preferred Alternative: Refined Presidio Parkway

Following release of the DEIS/R in December 2005, individuals and agency staff provided almost eight hundred comments regarding the environmental analysis and project alternatives. Based on these comments and agency/public workshops, it was determined that Alternative 5: Presidio Parkway, would best meet the purpose and need of this Doyle Drive Project, if certain modifications to the proposed design were made.

2.5.1 Development of the Preferred Alternative: Refined Presidio Parkway Alternative

In response to these comments, and to address the communities' and agencies' concerns regarding traffic circulation, tidal inundation, and parking issues, the following refinements were made to the Presidio Parkway Alternative:

Traffic Circulation

- By redesigning the Richardson connection as ramps connecting to an urban street, rather than mainline segments, the traffic balance between Richardson Avenue and Marina Boulevard is more closely matched to the existing traffic patterns and street network.
- In response to the plans by the San Francisco Department of Recreation and Parks (SFDRP) for the rehabilitation of the Palace of Fine Arts and surrounding grounds, the refined alternative maintains Palace Drive as a two-way road and accommodates the proposed modifications planned by SFDRP at north and south ends where Palace Drive connects to Lyon Street. Based on comments from the Lyon Street residents, the Refined Presidio Parkway Alternative will also maintain Lyon Street as a two-way street with a connection to Bay Street.

- To enhance pedestrian safety and accessibility the proposed design would provide pedestrian access from the Gorgas warehouses to the Palace of Fine Arts and from the Palace of Fine Arts to the Mason Street warehouses.
- The Hook Ramp Option at the Park Presidio Interchange was modified to reuse portions of the existing ramps to reduce impacts to resources while achieving similar improvements to traffic safety.
- To eliminate potential cut-through traffic on Lyon Street the access between Gorgas Avenue and Lyon Street has been eliminated.

Tidal Inundation

- The proposed facility may be subject to coastal events such as storm surge and tsunamis. In order to meet serviceability design criteria the profile needed to be raised so the proposed structures would clear the 100-year tsunami elevation of 3.4 meters North American Vertical Datum 1988 (NAVD88)². To accommodate the revised mainline profile, the profile of Halleck Street would have to be raised by an additional 0.8 meters (2.6 feet) at the north face of Building 228, with the crest of Halleck Street at an elevation of ten meters (32.8 feet), similar to the previous alternative.

Parking

- The refinements to the alternative also include a parking concept that maintains a similar parking supply to the existing condition. The main features are:
 - elimination of underground parking below Doyle Drive;
 - redesign parking west of Palace Drive and south of Mason Street warehouses as surface parking rather than underground parking;
 - modification to Palace Drive to provide perpendicular parking on both sides of a two-way Palace Drive; provide surface parking behind the Gorgas warehouses; and provide on-street parking along Gorgas Avenue.

Other Design Modifications

- In order to simplify construction, a portion of the alignment west of the Battery tunnels was adjusted to accommodate single stage construction of each tunnel structure.

These modifications were developed through a collaborative process with community members, local and resource agencies, and project team members.

² NAVD88 is a vertical datum developed by the National Oceanic Atmospheric Administration. A vertical datum is a set of constants that define a system for comparison of elevations.

2.5.2 Selection of the Preferred Alternative

The Doyle Drive Subcommittee to the Citizens' Advisory Committee (CAC), the Doyle Drive Executive Committee (comprised of lead, cooperating and responsible agencies) and the Authority all held meetings in July 2006 to consider recommendations for a preferred alternative and design options. All three groups made identical recommendations for selection of a modified Presidio Parkway with certain design options.

The unanimous recommendation for the Preferred Alternative was: a refined Alternative 5, Presidio Parkway, with specific design elements including the modified Hook Ramp Option for the Presidio Parkway Interchange and the Diamond Option for Presidio Access. In addition to these recommendations and modifications, the subcommittee voted to support three additional design refinements:

- Move Girard Intersection south;
- Restrict Lyon Street connection for the Presidio; and
- Reserve additional right of way for the connection from Marina Boulevard to Doyle Drive.

The groups did not support including the Merchant Road Slip Ramp Option, the Loop Ramp Option, or the Circle Drive Option.

2.5.3 Context Sensitive Design and Sustainability

In order to be sensitive to the project's environment, the project team considered its context and physical location carefully during the project planning stage. Additionally, a sizable planning effort had already taken place over the past decade involving residents and other stakeholders in the area.

Working with stakeholders, the development, selection, and refinement of the Preferred Alternative was carried out mindful of the principles of CSD and sustainability, as well as the desire to minimize and/or avoid impacts through creative design. In comparison with the Presidio Parkway Alternative, the refined alignment (Preferred Alternative) respects natural contours so the facility sits comfortably within the landscape and minimizes cutting, filling and hauling. When compared to the existing facility, the Preferred Alternative is also a better complement to the spectacular natural environment the facility resides in and restores scenic views of the Presidio and San Francisco Bay by eliminating the existing tall concrete structure.

Although there is now consensus among the project stakeholders on the general geometric design of the Preferred Alternative, the project team has a strong desire to ensure that detailed design and construction decisions enhance the sustainability of the project throughout its life.

Through ongoing workshops held with community members and agencies, a sustainability policy statement was developed. The initial sustainability policy has targeted the following areas to guide the development of specific goals and strategies:

- Water;
- Energy;
- Habitat;
- Landscape;
- Materials and Waste; and
- Community Resources.

Several goals and strategies for meeting those goals are being developed for each of the identified areas. As the project moves into its next phase, the specific goals and strategies will be incorporated into the design, construction and maintenance/operations phases. In addition, the responsibilities for implementation of the strategies, as well as monitoring and assessing the success of the strategies, will be determined.

Working together with stakeholders and resource agencies, the project team has already incorporated many solutions into the design of the Preferred Alternative in order to reduce or eliminate potential impacts to the natural environment, the Presidio, and community resources. Some of these engineering solutions include:

- To reduce disturbance to the existing bluff, the refined alternative raises the original profile of the southbound lanes by up to three meters (ten feet). To further retain the cultural relationship between the upper and lower portions of the Presidio, the landscaping over the Main Post tunnels will recreate the bluff north of the tunnels.
- The revised profile of the mainline facilitated the creation of greater separation between the northbound and southbound roadways over the future marsh expansion area which provides an opportunity for increased light penetration to the ground. The additional curvature to the southbound roadway also enhances the traffic calming impact of the roadway, reducing traffic speeds before reaching city streets.
- In conjunction with the realignment of the southbound roadway, the intersection of the off-ramp to Girard Road was moved 20 meters south (66 feet). This moved the connection along Gorgas Avenue away from the Gorgas Avenue warehouses thereby preserving the streetscape in front of the buildings.
- The intersection for the northbound on-ramp was also moved 20 meters (66 feet) south. In conjunction with reducing the northbound off-ramp from two lanes to one lane, much of the landscaping area west of the Palace of Fine Arts was preserved.

- Refined the design to avoid and minimize impacts to cultural resources including historic buildings, the historic Halleck streetscape, and the historic bluff.

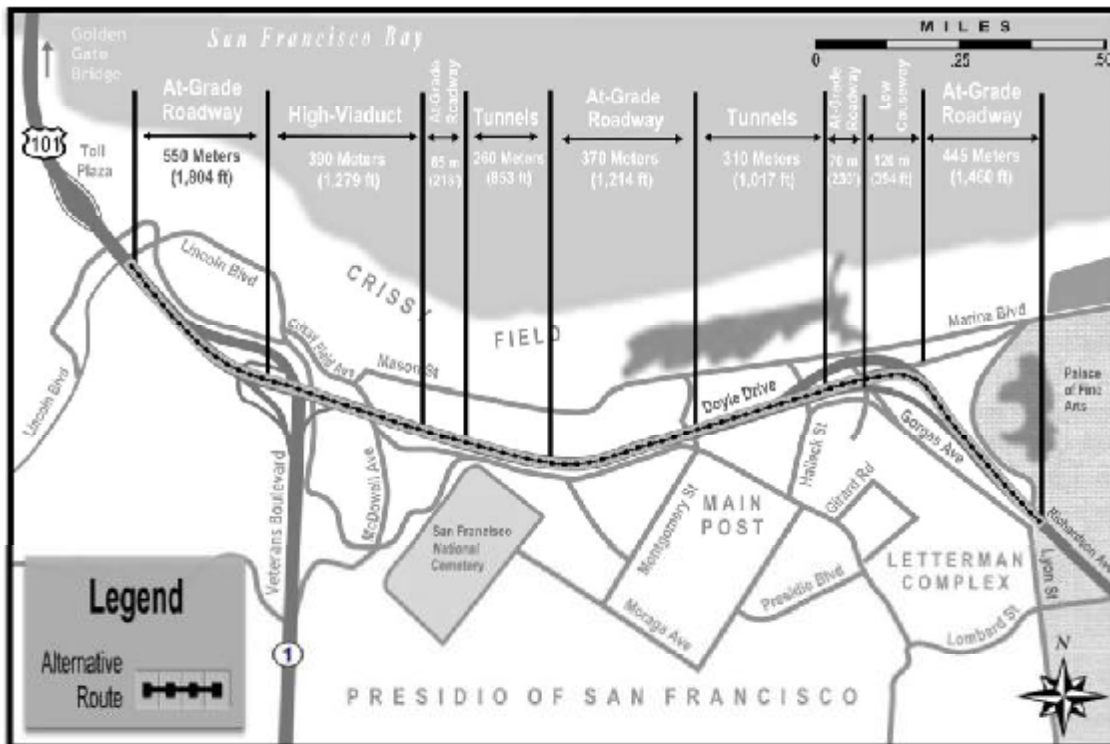
2.5.4 Description of the Preferred Alternative: Refined Presidio Parkway Alternative

The Refined Presidio Parkway Alternative, shown in **Exhibits 2-31 through 2-33** (on the following pages) would replace the existing facility with a new six-lane facility and a southbound auxiliary lane, between the Park Presidio Interchange and the new Presidio access at Girard Road. Detailed drawings showing the plan and profile of the Preferred Alternative in addition to the various design options can be found in **Appendix B**.

The new facility will consist of two 3.3-meter (11-foot) lanes and one 3.6-meter (12 foot) outside lane in each direction with three meter (10-foot) outside shoulders and 1.2-meter (four-foot) inside shoulders. The southbound direction will include a 3.3-meter (11-foot) auxiliary lane from the Park Presidio Interchange to the Girard Road exit ramp. The total roadway width will be 32.1 meters (105.3 feet) and the overall facility width including the median will vary from 37.1 to 44.6 meters (121.7 to 146.3 feet). The width of the proposed landscaped median will vary from five meters (16 feet) to 12.5 meters (41 feet). To minimize impacts to the park, the footprint of the new facility will overlap with a large portion of the existing facility's footprint east of the Park Presidio Interchange. This alternative will not preclude the Golden Gate Bridge Highway and Transportation District's parking of the moveable median barrier machine in the median of Doyle Drive south of the Toll Plaza. In some areas along the roadway, full restoration of mature natural species may take between 10 and 20 years.

A 390-meter (1,279-foot) long high-viaduct will be constructed between the Park Presidio Interchange and the San Francisco National Cemetery. The height of the high-viaduct will vary from 20 to 35 meters (66 to 115 feet) above the ground surface. Shallow cut-and-cover tunnels will extend 260 meters (853 feet) past the cemetery to east of Battery Blaney. The facility will then continue towards the Main Post in an open at-grade roadway with a wide heavily landscaped median. A retaining wall between 4 to 8 meters (13 to 26 feet) high will be constructed along the south side of the facility between the Battery and Main Post tunnels. A landscaped berm will be constructed along the north side of the facility to shield park visitors from the proposed facility.

Exhibit 2-31
Preferred Alternative: Refined Presidio Parkway



From Building 106 (Band Barracks) cut-and-cover tunnels up to 310 meters long (1,017 feet) will extend to east of Halleck Street. The amount of fill over the tunnels is being coordinated with the Trust based on requirements of the *Vegetation Management Plan*. The expected minimum depth to support native vegetation is two meters (six feet). The facility will then rise slightly on a low causeway 120 meters (394 feet) long over the site of the proposed Tennessee Hollow restoration and then pass over a depressed Girard Road. The low causeway will rise to approximately three meters (ten feet) above the surrounding ground surface at its highest point. East of Girard Road the facility would return to existing grade north of the Gorgas warehouses and connect to Richardson Avenue. The proposed facility will provide a transition zone starting from the Main Post tunnel to reduce vehicle speeds prior to entering city streets. A motor control and switch gear room to operate the tunnel life-safety equipment will be integrated with the Main Post tunnels.

The Park Presidio Interchange will be reconfigured due to the realignment of Doyle Drive to the south. The exit ramp from southbound Doyle Drive to southbound Veterans Boulevard will be replaced with standard exit ramp geometry and widened to two lanes. The loop of the northbound Doyle Drive

exit ramp to southbound Veterans Boulevard will be improved to provide standard exit ramp geometry. The northbound Veterans Boulevard connection to northbound Doyle Drive will be realigned to provide standard entrance ramp geometry. The northbound Veterans Boulevard connection to southbound Doyle Drive will be reconstructed in a similar configuration as the existing directional ramp with improved sight lines, and exit/entrance geometry.

The Preferred Alternative will provide direct access to the Presidio and indirect access to Marina Boulevard in both directions via access ramps from Doyle Drive connecting to an extension of Girard Road. East of the new Letterman garage, Gorgas Avenue is a one-way street with a signalized intersection at Richardson Avenue. North of Richardson Avenue, Lyon Street will remain in its existing configuration to provide access to Palace Drive. The surface parking spaces will be reconfigured to maintain the existing parking supply in the area and improve pedestrian access between the Presidio and the Palace of Fine Arts.

The Preferred Alternative will include extended bus bays on both sides of Richardson Avenue which will accommodate up to four buses each and improved crosswalks to provide safer and enhanced pedestrian circulation in the area. The extended bus bays will keep the buses out of the main flow of traffic during stops, provide safer merging capability for the buses, and will facilitate transfers between Golden Gate Transit, Muni and PresidiGo vehicles.

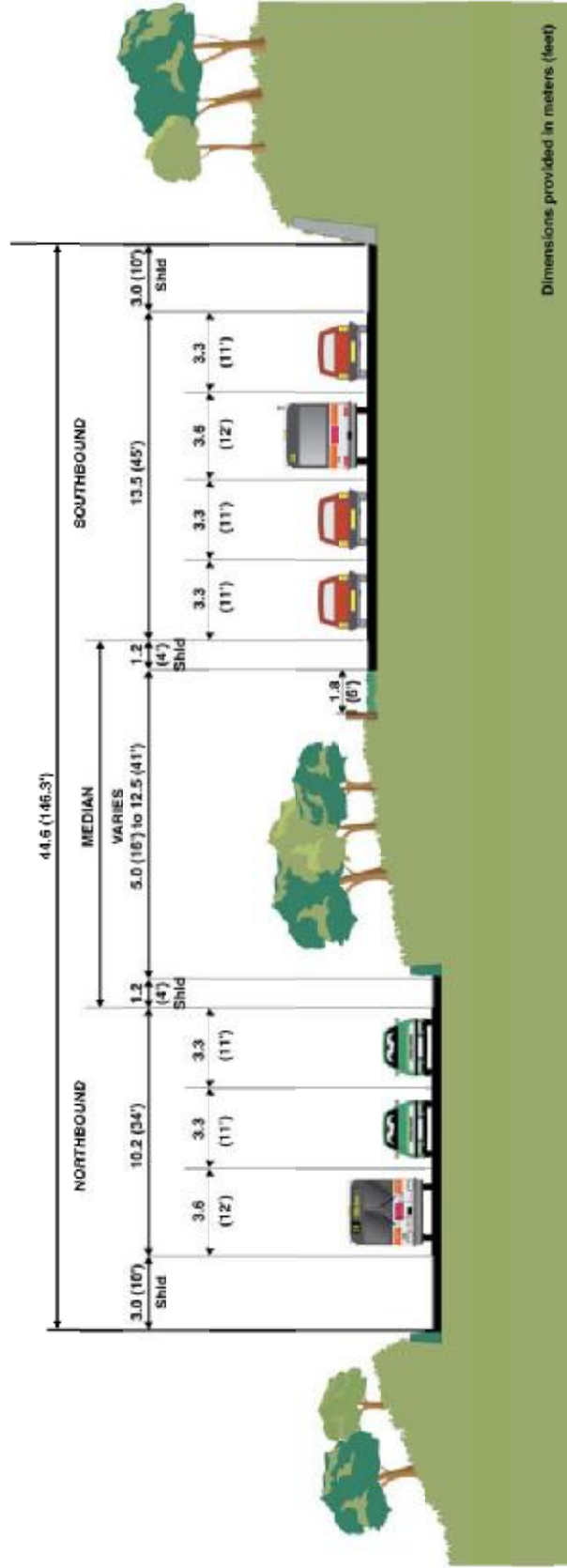
Retaining walls will be required at the Park Presidio Interchange to accommodate the reconstruction of the ramps. Retaining walls will also be required in the eastern end of the alignment primarily along the extended Girard Road. Fences will be required along the edge of the at-grade portions of the roadway to restrict pedestrian access onto the roadway.

Exhibit 2-32
Prefereed Alternative, Refined Presidio Parkway: Plan



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Exhibit 2-33
Preferred Alternative, Refined Presidio Parkway: Cross Section



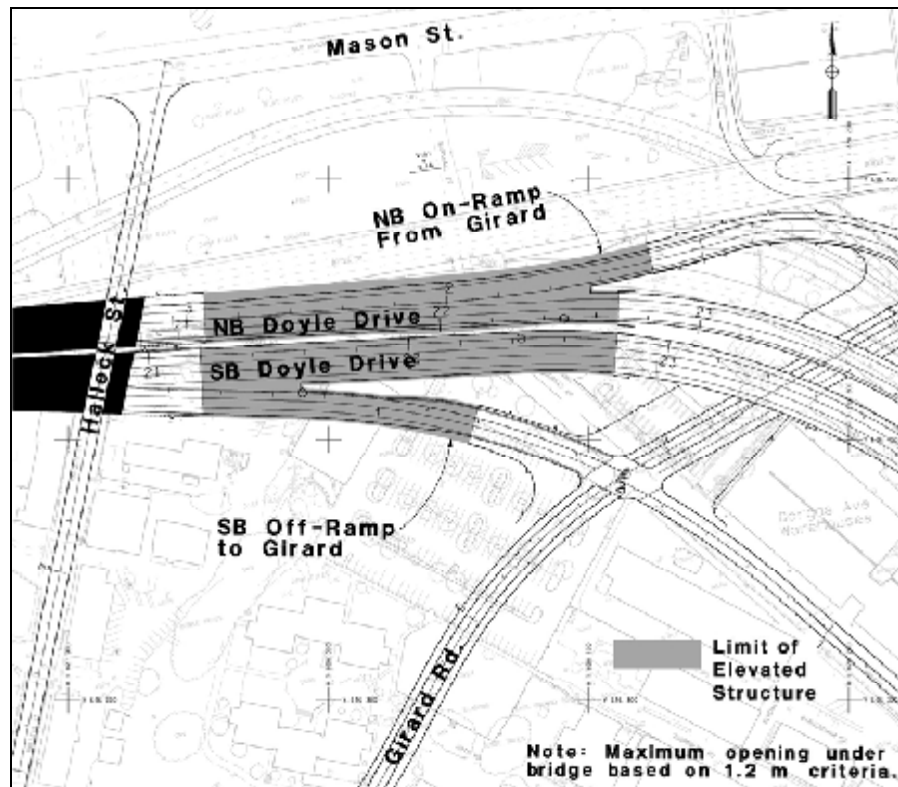
Note: Landscaping shown for illustrative purposes only.

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2.5.5 Tsunami Criteria

During the design of Alternative 5 - Presidio Parkway, a high tide water level was used to set the elevation of northbound and southbound Doyle Drive as well as the Girard Road on and off-ramps over Tennessee Hollow. The assumed high tide water level of 1.2 meters (3.9 feet) allowed for a 61 meter (200 foot) structure opening underneath the southbound off-ramp to Girard Road (see the gray shaded area in **Exhibit 2-34** below).

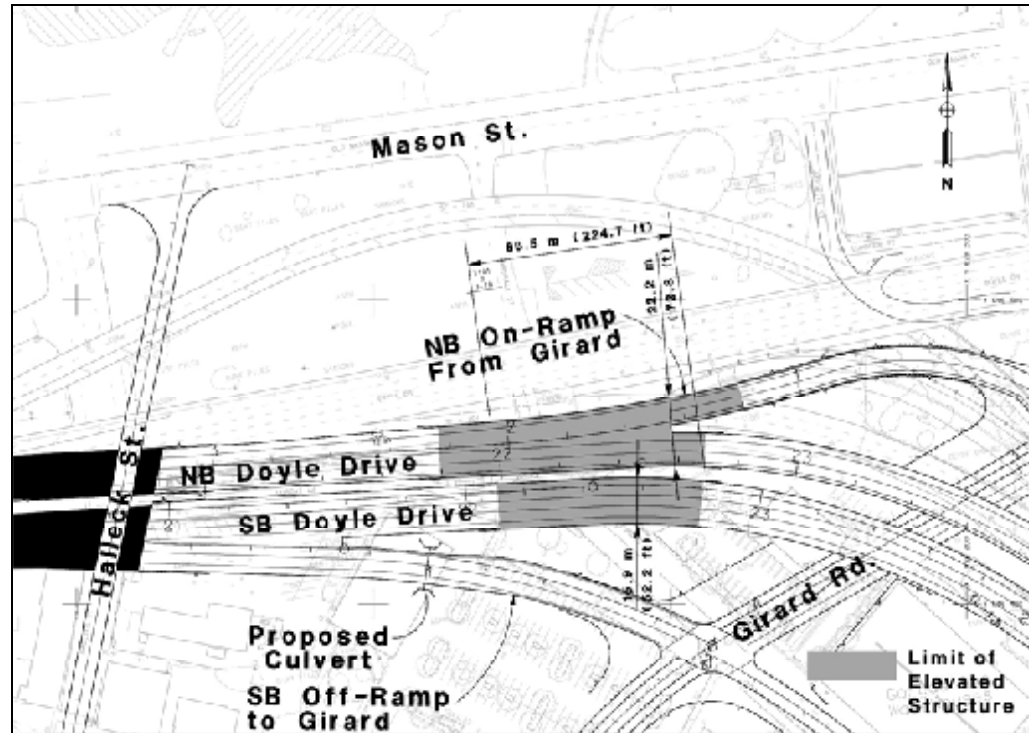
Exhibit 2-34
Alternative 5: Presidio Parkway - 1.2-Meter High Tide Criteria



During the development of the Preferred Alternative - Refined Presidio Parkway, a different criterion was used. This criterion is based on the fact that with the potential expansion of Crissy Marsh, the proposed facility may be subject to coastal events such as storm surge and tsunamis. In order to meet serviceability design requirements the bottom of the structures over Tennessee Hollow would need to clear the 100-year tsunami elevation of 3.4 meters (11.2 feet). This would also require raising Halleck Street an additional 0.8 meters (2.6 feet) at the north face of Building 228, thus setting the crest of Halleck Street at to an elevation of ten meters (32.8 feet). If this 100-year tsunami criterion were applied to Alternative 5 there would be no clear opening below the southbound

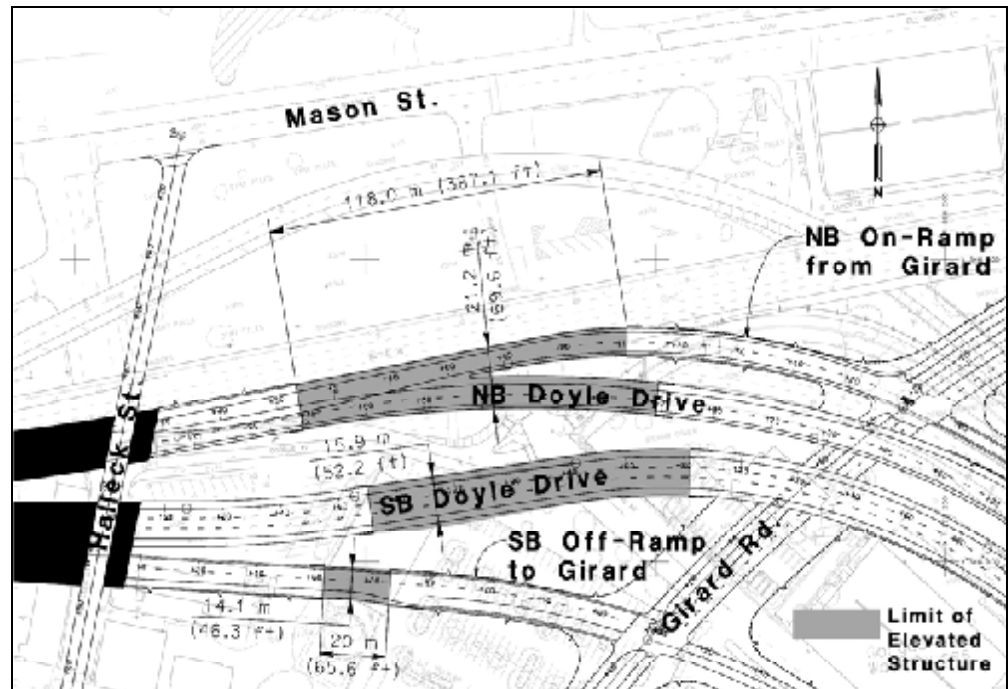
off-ramp. Flows from Tennessee Hollow would have to be conveyed into the marsh by way of a culvert below the off-ramp (see **Exhibit 2-35** below).

Exhibit 2-35
Alternative 5: Presidio Parkway - 3.4-Meter Tsunami Criteria



With the refinements made in the Preferred Alternative, applying the 100-year tsunami criterion will result in a maximum length of structure opening below the southbound Doyle Drive off-ramp of 20 meters (65.6 feet) (see **Exhibit 2-36**). For detailed descriptions of the relevant dimensions for each of the structures over Tennessee Hollow for each alternative based on the 100-year tsunami elevation of 3.4 meters (11.2 feet) please see Section 3.2.1 Land Use and Planning.

Exhibit 2-36
Preferred Alternative - 3.4-Meter Tsunami Criteria



2.5.6 Design Standard Compliance

The severe degradation of the existing structures, seismic vulnerability and the existing nonstandard design elements, especially the lack of shoulders and a median barrier, create a great urgency to remove and replace the existing facility with structures designed to current seismic standards while applying current geometric standards wherever feasible.

Agency Coordination

Given the extreme environmental sensitivity of the project's context and setting within the National Park and National Historic Landmark District, there is a need to develop consensus among the various participating agencies: FHWA, Caltrans, SFCTA, the cooperating agencies (Presidio Trust, NPS and VA), and the GGBHTD in order to advance this project under the guidelines of *49 U.S.C Section 303 (Department of Transportation Act, Section (40))* and implement the seismic and traffic safety improvements.

This urgency to address seismic and traffic safety and the need to develop a consensus among the agencies, requires flexibility in applying the design standards that are still considered safe and comfortable for users of the facility. Therefore, in consideration of the project's context and setting within a National Park/National Historic Landmark District and in order to develop the consensus

that is necessary to advance the project, several design exceptions are being considered. The project as proposed will provide tremendous seismic and traffic safety improvement over the existing facility.

The project team including the FHWA, Caltrans, SFCTA, the cooperating agencies (Presidio Trust, NPS and VA), the GGBHTD have worked closely together to develop a consensus for a design which will:

- seismically upgrade the structures and improve traffic safety;
- provide for the minimum requirements of traffic operations; and
- balance the design geometry.

In addition, they have worked together to minimize the overall footprint of the facility and impacts to the surrounding environmental and cultural resources while considering traffic handling/construction staging, cost effectiveness, and conforming to adjacent local street and state highway segments.

Constraints in Meeting Design Standards

The facility's existing nonstandard design elements, its context and setting within a National Park/National Historic Landmark District, and the need to develop consensus in order to advance the project all restrict a staged construction strategy and the proposed geometry of mainline Doyle Drive (Route 101), the Park Presidio Interchange, Veterans Boulevard (Route 1), and the Girard Road Interchange. Thus the overall footprint of the facility and, consequently, the cross-sectional width of Doyle Drive are restricted by the need to conform with nonstandard lane and shoulder widths at the Toll Plaza, Park Presidio Boulevard, and Richardson Avenue.

In addition, the existing compact geometry of the Park Presidio Interchange restricts the configuration of mainline Doyle Drive (Route 101) and mainline Veterans Boulevard (Route 1). This existing restrictive geometry limits operating speeds through the interchange to approximately 30 kilometers/hour (18 miles/hour) to 50 kilometers/hour (31 miles/hour). Compounding this existing restrictive geometry is the need for proposed grades to match the existing mainline Doyle Drive (Route 101) at a minimum of 300 meters (984 feet) to the east of the Toll Plaza. The GGBHTD uses this area to adjust the daily Toll Plaza operations by varying lane configurations to accommodate the morning and afternoon peak commutes.

Safety Improvements

The Preferred Alternative proposes to incorporate safety improvements wherever reasonably feasible within the setting and context of a National Park to the standards established in the Caltrans *Highway Design Manual*. The design of safety improvements also takes into account traffic handling, construction staging, cost effectiveness, and conformity to adjacent street and state highway segments. The proposed safety improvements include:

- seismic upgrading of structures;
- divided roadbeds for northbound and southbound Doyle Drive;
- improved structure vertical clearances and upgrading of bridge rails;
- improved geometry including horizontal and vertical curvature, stopping sight distances, deceleration lengths, ramp geometry, and superelevations;
- standard 3.6-meter (12-foot) lane widths wherever feasible with 3.3-meter (11-foot) lane widths at constrained locations; and
- standard shoulders wherever feasible.

2.6 Comparison of Earthwork/Excavation

Each build alternative will require earthwork and excavation. This work will result in disturbance of both artificial fill and native materials. **Exhibit 2-37** summarizes the total volumes of excavation for each alternative.

For Alternative 2, the No-Detour Option would require approximately 173,000 cubic meters (226,000 cubic yards) of imported fill in addition to 196,000 cubic meters (256,000 cubic yards) of excavation, of which 126,000 cubic meters (165,000 cubic yards) is not reusable. This would result in a total of 243,000 cubic meters (318,000 cubic yards) of fill. The With Detour Option would require approximately 99,000 cubic meters (130,000 cubic yards) of imported fill in addition to 156,000 cubic meters (204,000 cubic yards) of excavation, of which 85,000 cubic meters (111,000 cubic yards) is not reusable. This would result in a total of 170,000 cubic meters (222,000 cubic yards) of fill.

For Alternative 5, the Presidio Parkway Alternative, earthwork operations would result in approximately 296,000 cubic meters (387,000 cubic yards) of excess material for off-site disposal. The Presidio Parkway Alternative would have 487,000 cubic meters (637,000 cubic yards) of excavation and 191,000 cubic meters (250,000 cubic yards) of fill.

For Preferred Alternative, the Refined Presidio Parkway, earthwork operations would result in approximately 207,000 cubic meters (271,000 cubic yards) of excess material for off-site disposal. The Preferred Alternative would have 418,000 cubic meters (547,000 cubic yards) of excavation and 211,000 cubic meters (276,000 cubic yards) of fill.

There is the potential that hazardous materials would be encountered during excavation and would require appropriate disposal. Any hazardous materials encountered during construction of the Doyle Drive Project would be handled under the procedures described in the Avoidance, Minimization and/or Mitigation Measures of Section 3.3.3. In addition, Section 3.3.3 provides the estimated costs associated with hazardous material removal procedures.

Exhibit 2-37
Comparison of Alternatives: Earthwork/Excavation

ALTERNATIVE	OPTION	TOTAL EXCAVATION cubic meters (cubic yards)	EARTHWORK BALANCE cubic meters (cubic yards)
Alternative 2	No-Detour	196,000 (256,000)	173,000 (226,000) import
	With Detour	156,000 (204,000)	99,000 (130,000) import
Alternative 5	All Options	487,000 (637,000)	296,000 (387,000) disposal
Preferred Alternative		418,000 (547,000)	207,000 (271,000) disposal

Source: June 2005 and September 2007 Advanced Planning Study Reports.

2.7 Project Costs

The estimated construction costs for each of the alternatives have been developed and are shown in **Exhibit 2-38**. These costs are based on 2008 unit prices and are escalated at the following rates to represent the year of expenditure costs: 2007-2008 at five percent per year, 2008-2010 at four percent per year, and 2010-2014 at 3.3 percent per year. These cost estimates are conceptual and are based on information that was available during the preparation of this environmental document. Estimates were developed from information obtained in 2007 based on the preliminary alignments, existing utilities, historic construction costs, and quotations from various local suppliers and contractors. These estimates range from zero for Alternative 1 - No-Build to approximately \$1.1 billion for Alternative 5 (estimates in year of expenditure dollars). The total construction cost for the Preferred Alternative is approximately \$853 million.

The *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU) (Pub. L. 109-59, 119 Stat. 1144) requires the financial plan for all Federal-aid projects with an estimated total cost of \$500 million or more to be approved by the Secretary (i.e. FHWA) based on reasonable assumptions. The \$500 million threshold includes capital outlay support costs and design services. FHWA has interpreted reasonable assumptions to be a risk based analysis. These cost estimate reviews are required to provide the risk based assessment of the estimate and are used in the approval of the financial plan.

In March 2008, the FHWA conducted a cost estimate review of the Preferred Alternative to verify the accuracy and reasonableness of the current total cost estimate to complete the project and to develop a probability range for the cost estimate that represents the project's stage of design. The FHWA worked with the Project team to review the material quantities and unit costs and develop the expected variance for each. The FHWA input the expected variance into a

Monte Carlo³ simulation to develop forecast curves that represent a cost estimate range for the project.

The Project team met with the FHWA in April 2008 and May 2008 to determine the confidence level of the cost estimate range based on the project's current stage of development. Based on those discussions, the FHWA performed a Monte Carlo simulation which resulted in total project cost estimate range of \$1.02 to \$ 1.14 billion. This validated the Project team's total project cost of \$1.045 billion.

Exhibit 2-38
Estimated Construction Cost of Project Alternatives
(in year of expenditure dollars)

ALTERNATIVE		OPTION		ROADWAY	STRUCTURES	CONSTRUCTION TOTAL
1	No-Build	—		\$0	\$0	\$0
2	Replace and Widen	No-Detour		\$130,300,000	\$657,800,000	\$788,100,000
		With Detour		\$140,00,000	\$702,100,000	\$842,100,000
5	Presidio Parkway	Diamond	Loop Ramp	\$298,800,000	\$805,500,000	\$1,104,300,000
			Hook Ramp	\$297,300,000	\$782,000,000	\$1,079,300,000
		Circle	Loop Ramp	\$299,100,000	\$805,500,000	\$1,104,600,000
			Hook Ramp	\$297,500,000	\$782,000,000	\$1,079,500,000
		Merchant Ramp		\$16,100,000	\$1,300,000	\$17,400,000
	Preferred			\$281,100,000	\$571,500,000	\$852,600,000

Source: Parsons Brinckerhoff, 2008

2.8 Construction Activities (Alternatives 2 and 5)

As part of this environmental analysis, a preliminary construction plan was developed. The following discussion provides an overview of the possible construction scenarios for Alternatives 2 and 5.

2.8.1 Construction Staging for Alternatives 2 and 5

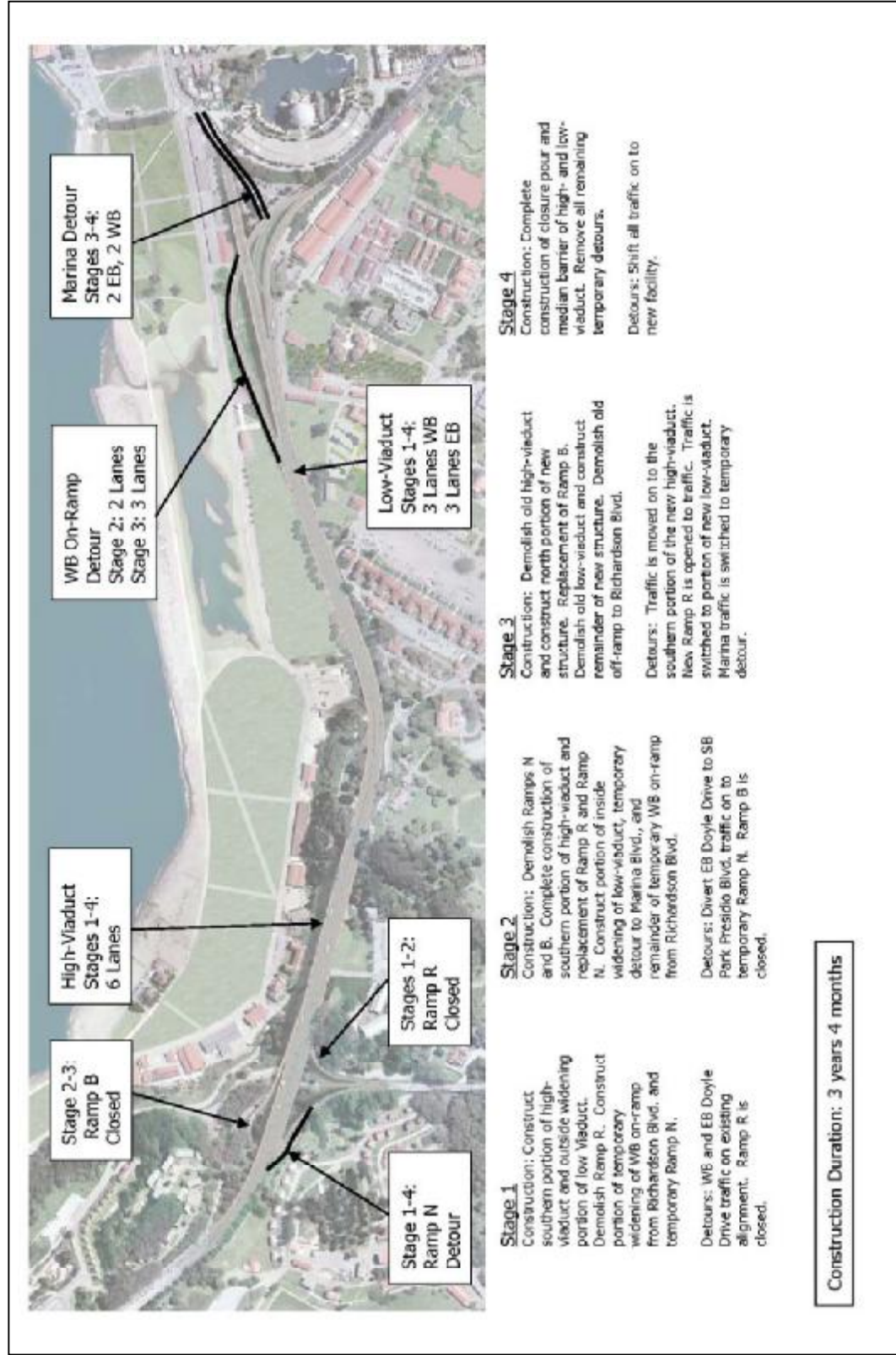
Staging areas vary by alternative. The Replace and Widen Alternative – No-Detour Option would only use the parking lot of the Post Exchange and Commissary as the primary staging area. For the Replace and Widen Alternative - Detour Option, the primary staging would occur on the parking lot and the site of both the Post Exchange (Buildings 605 and 606) and Commissary (Buildings 610 and 653). The primary staging area for the Presidio Parkway Alternative

³ A Monte Carlo simulation calculates multiple scenarios of the outcome by continually sampling random values from the expected variance. The simulations ran by FHWA consisted of 10,000 iterations.

would be the Post Exchange building site and parking lot. Each alternative would use a secondary staging area on the parking lot between Buildings 230 (Presidio Archeology Lab) and 1063 (Medical Supply Warehouse). Access to the buildings adjacent to the staging areas and throughout the Presidio would be maintained during the construction period, which is estimated to last three years and four months for Alternative 2, No-Detour Option, four-years and three months for Alternative 2, With-Detour Option, and four years and seven months for Alternative 5.

Storage of equipment and materials on-site would be limited to the staging and construction areas to minimize ground disturbance. The majority of equipment and materials would be transported to the site using designated haul roads during daytime hours to minimize disturbance to the surrounding residential neighborhoods and to conform with the city of San Francisco construction noise ordinance. Access for construction vehicles and equipment would be via Lombard Street, Richardson Avenue, Doyle Drive from the west, and Veterans Boulevard. Mason Street and Lincoln Boulevard have been identified as haul roads within the Presidio. Additional haul roads, including completed detour roads, would be identified prior to the start of construction. Following construction, all haul roads would be restored to existing conditions, or as defined by the land managing agency. **Exhibits 2-39** through **2-41** on the following pages present preliminary staging plans for Alternatives 2 and 5.

Exhibit 2-39
Alternative 2, Replace and Widen – No-Detour Option
Construction Staging Plan



Stage 1
 Construction: Construct southern portion of high-viaduct and outside widening portion of low viaduct. Demolish Ramp R. Construct portion of temporary widening of WB on-ramp from Richardson Blvd. and temporary Ramp N.
 Detours: WB and EB Doyle Drive traffic on existing alignment. Ramp R is closed.

Stage 2
 Construction: Demolish Ramps N and B. Complete construction of southern portion of high-viaduct and replacement of Ramp R and Ramp N. Construct portion of inside widening of low-viaduct, temporary detour to Marina Blvd., and remainder of temporary WB on-ramp from Richardson Blvd.
 Detours: Divert EB Doyle Drive to SB Park Presidio Blvd. traffic on to temporary Ramp N. Ramp B is closed.

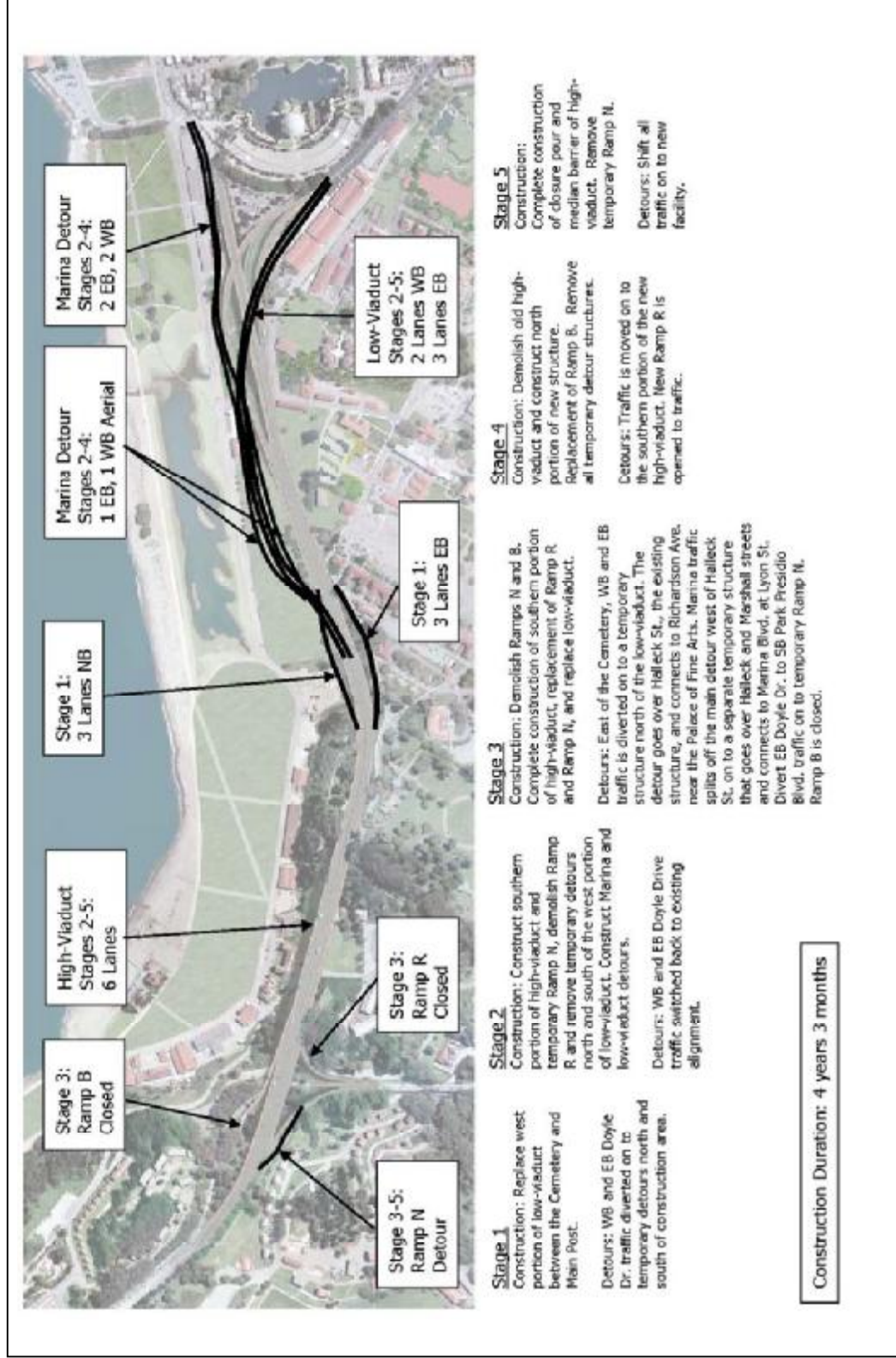
Stage 3
 Construction: Demolish old high-viaduct and construct north portion of new structure. Replacement of Ramp B. Demolish old low-viaduct and construct remainder of new structure. Demolish old off-ramp to Richardson Blvd.
 Detours: Traffic is moved on to the southern portion of the new high-viaduct. New Ramp R is opened to traffic. Traffic is switched to portion of new low-viaduct. Marina traffic is switched to temporary detour.

Stage 4
 Construction: Complete construction of closure pour and median barrier of high- and low-viaduct. Remove all remaining temporary detours.
 Detours: Shift all traffic on to new facility.

Construction Duration: 3 years 4 months

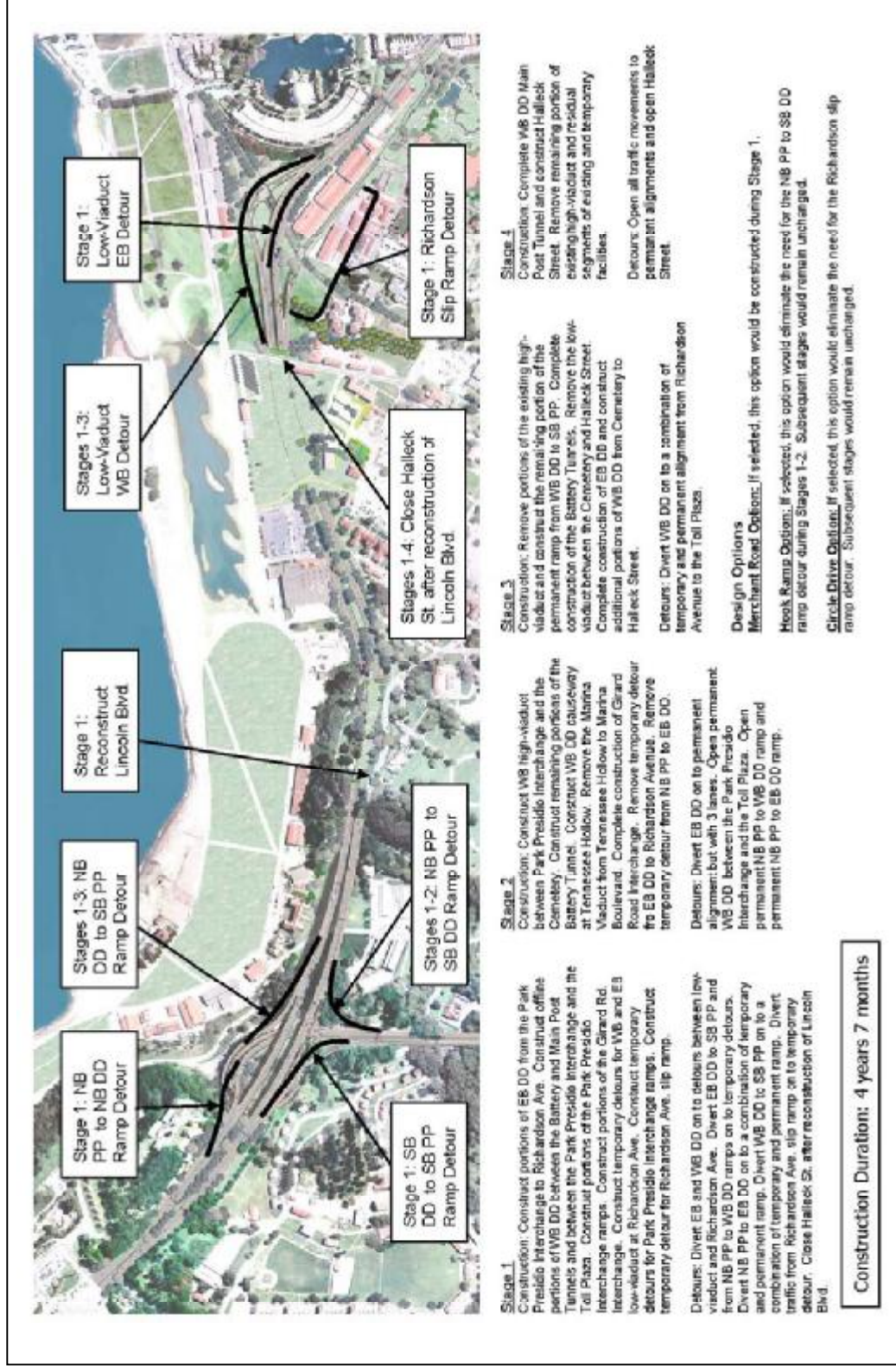
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Exhibit 2-40
Alternative 2, Replace and Widen – With Detour Option
Construction Staging Plan



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Exhibit 2-41
Alternative 5, Presidio Parkway
Construction Staging Plan





2.8.2 Construction Methods

Alternatives 2 and 5 would involve standard construction techniques and require large-scale construction equipment and labor-intensive activities. General activities would include:

- mobilization, clearing of vegetation and removal of existing facilities;
- excavation, grading, stockpiling of rock and soil;
- installation of temporary works such as excavation shoring, temporary supports, falsework and formwork; and
- foundation installation, roadway construction, placement of reinforced concrete, erection of structural steel and precast concrete, fill placement and compaction, landscaping, and demobilization.

Equipment would include concrete saws, concrete breakers and impact hammers, pile drilling and driving rigs, pile hammers, vibratory hammers, bentonite mixing and processing equipment, earth moving equipment, cranes, hydraulic jacks, on-site concrete batching plant, concrete trucks, well-point pumps, and material delivery trucks. Driven piles would only be used in locations where there would be no potential damage to historic structures. Quieter operations are achievable by using technologies such as mufflers and other types of noise dampers attached to equipment. Moreover, quiet pile installation technologies were investigated. These included the more common vibratory hammer and also a relatively new technology known as the “Silent-Piler” which uses the “press-in” method. It has proved to be very promising and may also be used.

Methods used to construct foundations, tunnels, depressed sections, and retaining walls would include the use of: sheet-piles, tie-back walls, soldier pile walls, cut-off walls (secant pile and diaphragm walls), cast-in-drilled-hole (CIDH) concrete piles, and the similar cast-in-steel-shell (CISS) concrete piles, which differ in that the steel shell that supports the hole would remain as part of the pile structure. Piling would be installed in rock and soil; some locations would require drilling, driving and a combination of the two.

General methods used to construct aerial structures would include the use of; cast-in-place post-tensioned (CIP/PS) concrete, structural steel erection, and pre-cast pre-stressed concrete (PC/PS) erection. Specialized overhead construction techniques and special falsework were considered to minimize ground disturbance.

CIDH and slurry walls would use bentonite slurry to maintain the shape of excavations. Bentonite processing plants are typically self contained units located at excavation sites which produce low risk clay slurry (bentonite).

Selection of methods would depend on the type of structure selected during final design and would take into account cost, feasibility of construction, the

construction marketplace, natural environment, and avoidance of cultural resources.

Aerial Superstructures and Substructures

There were several superstructure types considered for the aerial structures: the CIP/PS box girder, steel tubular deck truss, steel plate girder and CIP/PS composite box-girder with truss laterals.

The CIP/PS conventional box-girder design is standard in California and requires shorter spans and therefore more support columns. The other structure types allow for longer spans of up to 80 meters (262 feet).

The structure types considered at various locations along the facility were:

- *Park Presidio Interchange Area.* The structures in this area included a CIP/PS slab viaduct carrying Route 1 and a CIP concrete “U” section ramp that was a closed box passing under Doyle Drive.
- *High-Viaduct and Access Ramps.* The superstructure types being considered were: the CIP/PS box girder, steel tubular deck truss, steel plate girder and CIP/PS composite box-girder with truss laterals.
- *Eastern Bluff at the Battery.* Retaining wall and cut-and-cover CIP concrete tunnel.
- *Main Post.* Covered CIP concrete tunnel supported on piles.
- *Marina Viaduct.* Two types were considered: the CIP/PS conventional box girder and a modified CIP/PS box girder with overhangs supported on PC/PS brackets.
- *Tennessee Hollow and Girard Road Area.* The structures in this area included a CIP/PS slab “causeway”, CIP concrete “U” section supported on piles and installed using cut-off walls, retaining walls and a simple span CIP/PS bridge.

Aerial structure foundations would most likely be CIDH or CISS piles approximately 20 meters (65 feet) long and 0.9 to 1.2 meters (3 to 4 feet) in diameter. The installation of piles would require either drilling a hole to a pre-determined depth or driving a casing and removing the soil. A rebar support cage would then be lowered into the center of the hole or casing and concrete poured in, forming the pile. Depending on groundwater levels, full-length casings could be required but if not, the hole would be filled with bentonite slurry to stabilize the walls. This would require a bentonite processing plant on-site to process displaced bentonite as concrete is poured. The slurry would be displaced from the hole as the concrete is placed from a concrete pump truck using concrete delivered from mix trucks or from an on-site plant.

Tunnels

The tunnels would be constructed using the cut-and-cover method. The typical sequence for construction would include:

- excavation to the necessary length and depth;

- installation of required substructures and ground water conveyance systems, and if necessary, installation of waterproof membrane;
- pouring of concrete for the base slabs, walls, and the roof;
- covering the top and sides of the tunnel with a waterproofing membrane; and
- backfilling over the top of the tunnel to create the approved topography.

Because of potential hydrological and biological sensitivity at the eastern bluffs north of the San Francisco National Cemetery, between McDowell Avenue to the west and the eastern edge of the cemetery to the east, further hydrogeologic investigations would be conducted before final design to determine the hydrogeology and extent of groundwater flow. A water transfer concept has been developed that, if necessary, can transfer groundwater around the tunnel without allowing longitudinal flow along the exterior of the concrete walls to maintain wetland vegetation on the northern bluff face. The concept includes high-permeability strip drains to intercept groundwater on the upstream (south) side of the tunnel and transport it around the outside of the tunnel to locations on the downstream (north) side of the tunnel. As part of final design, careful evaluation of subsurface conditions would be undertaken for design and installation of a hydrologic conveyance system.

At the closest point at the National Cemetery, the limit of the tunnel structure would be one meter (three feet) north of the National Cemetery fence line. No tiebacks would be used in this area. However, if necessary a rigid shoring system would be incorporated into the final tunnel wall and designed to minimize any ground movement and avoid the cemetery.

Earthwork

It is anticipated that material excavated during construction of the tunnels would be suitable for reuse as fill in the project corridor. With Alternative 5, approximately 191,000 cubic meters (250,000 cubic yards) would be excavated and returned as fill. Excess material would require off-site disposal. Alternative 2, No-Detour Option would require 196,000 cubic meters (256,000 cubic yards) of excavation, of which 126,000 cubic meters (165,000 cubic yards) is not reusable. The With-Detour Option would require 156,000 cubic meters (204,000 cubic yards) of excavation, of which 85,000 cubic meters (111,000 cubic yards) is not reusable. Both options would require imported fill (see **Exhibit 2-37** provided earlier in this chapter). For reuse of excavated soils in the project corridor, the Trust's thresholds for soil contaminants would be followed.

Bridge Removal

The steel deck truss at the Presidio (High) Viaduct would be removed from the top down within its footprint. The reinforced concrete and steel stringer approaches would be removed similarly. The deck would be removed first, followed by removal of the steel pieces by flame cutting the steel into manageable pieces. Concrete substructures would be removed using breakers.

The cast-in-place Marina (Low) Viaduct would generally be removed using breakers. In the areas where vibrations must be controlled, sections can be saw-cut into manageable pieces and lifted onto trucks for breakup in another location. Debris would be sorted and piled and then removed. Dust would be controlled through appropriate dust control measures.

Detours

The Alternative 2, With Detour Option would require a 20.4-meter (67-foot) wide temporary elevated detour facility to be constructed to the north of existing Doyle Drive to maintain traffic through the construction period. Access to Marina Boulevard during construction would be maintained on an elevated temporary structure south of Mason Street. On- and off-ramps to the mainline detour facility would connect to the existing Marina Boulevard/Lyon Street intersection. The detour structure would require the temporary removal of four Mason Street warehouses (Buildings 1185, 1184, 1183, and 1182).

The detour structures would be removed following completion of the permanent structures, and the buildings would be returned to their original location.

Demolition of Detours and Existing Structures

Standard demolition equipment would be used to dismantle the existing structures and the temporary detour structures after completion of the replacement structures. Demolition would include cutting and pulverization of concrete into pieces on-site that could be used as back fill in the project corridor. Piles from the existing structure would be cut off to an elevation one meter (3.28 feet) below grade per Caltrans standard specifications. Curtains may be required during demolition of existing structure to contain release of airborne lead.

2.8.3 Construction Timing

The preliminary construction staging assumes that a typical construction schedule would be used for the Doyle Drive Project. This would include the scheduling of some activities during hours of low traffic volumes. Low traffic volumes would occur on Doyle Drive at night and on local roads during the middle of the day as well as at night. The purpose of scheduling activities during these hours is to ensure that roadways (in the construction area) are open during the peak traffic times to minimize traffic disruption. The types of construction activities which may occur in the hours during low traffic volumes are:

- erection/removal of falsework to permit construction overhead;
- erection/removal of temporary shielding to permit demolition overhead;
- demolition of structures over minor roads; and
- construction of the Main Post tunnel roof for Alternative 5.

2.8.4 Temporary Roadway Closures

To accommodate the construction staging for Alternatives 2 and 5 there will need to be planned, short duration closures of the mainline, ramps, and local roads. These closures would occur during low traffic volume hours (short-term closure) to minimize impacts to traffic.

Exhibit 2-42 depicts the anticipated short-term closures and associated construction activities based on the conceptual staging plans developed for the project. In addition, lane closures would be required to erect overhead signs needed for the project. Type and location of signs would be determined during the final design phase.

Exhibit 2-42
Short-Term Roadway Closures During Construction: Low Traffic Volume Hours

LOCATION OF CLOSURE	PURPOSE OF CLOSURE	ALTERNATIVE 2 NO-DETOUR	ALTERNATIVE 2 WITH DETOUR	ALTERNATIVE 5 PARK PRESIDIO
NB Doyle Drive	Main Post Tunnel Roof Construction			X
SB Doyle Drive	Main Post Tunnel Roof Construction			X
NB Doyle Drive to NB Veterans Blvd.	Bridge Removal/Falsework			X
NB Veterans Blvd. to NB Doyle Drive	Temporary Bridge Construction and Removal/Bridge Removal/Falsework	X	X	X
NB Doyle Drive to SB Veterans Blvd.	Bridge Removal/Falsework			X
Lincoln Blvd. at Park Presidio Interchange	Falsework	X	X	X
Crissy Field Avenue	Bridge Removal/Falsework	X	X	X
Mc Dowell Road	Falsework	X	X	X
Halleck Street	Bridge Removal/Falsework	X	X	
Girard Road	Bridge Removal			X
NB Richardson Ave at Doyle Drive	Bridge Removal/Falsework/Temporary Bridge Support			X
NB Richardson Ave to NB Doyle Drive	Temporary Bridge Support			X
Marshall Street	Bridge Removal/Falsework	X	X	X
Javowitz Street	Bridge Removal/Falsework	X	X	X
Crook Street	Bridge Removal/Falsework	X	X	
Richardson Slip Ramp	Bridge Removal			X

2.8.5 Long-Term Roadway Closures

The conceptual staging plans also identified the need for long-term closure (greater than one month) for ramps and local roads. **Exhibit 2-43** depicts the long-term closures and associated construction activities.

More information regarding anticipated roadway closures is provided in the *Draft Transportation Management Plan*, June 2007 (see **Appendix K**), developed for this project.

Exhibit 2-43
Potential Long-Term Roadway Closures

LOCATION OF CLOSURE	PURPOSE OF CLOSURE	ALTERNATIVE 2 NO-DETOUR	ALTERNATIVE 2 WITH DETOUR	ALTERNATIVE 5 PARK PRESIDIO
NB Doyle Drive to SB Veterans Blvd	Ramp Reconstruction	X	X	
NB Veterans Blvd to SB Doyle Drive	Ramp Reconstruction	X	X	
Lincoln Blvd	Mainline Doyle Drive Construction	X		X
Halleck Street	Mainline Doyle Drive Construction and Road Reconstruction			X

2.9 Construction Activities for the Preferred Alternative

As part of this environmental analysis, a preliminary construction plan was developed for the Preferred Alternative. The following section provides an overview of the possible construction scenario that may be used for the Preferred Alternative.

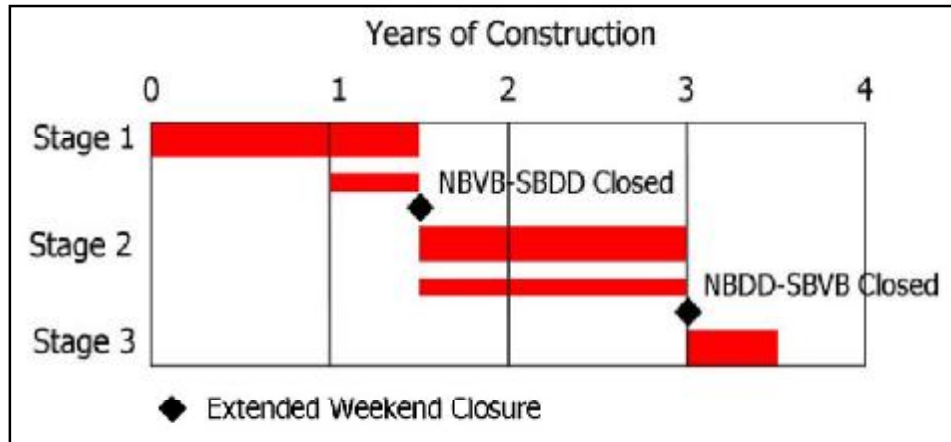
2.9.1 Construction Staging

The primary staging area for the Preferred Alternative will be the Post Exchange building site and parking lot. The secondary staging area will be located on the parking lot between Buildings 230 (Presidio Archeology Lab) and 1063 (Medical Supply warehouse) (see **Exhibit 2-44**). Access to the buildings adjacent to the staging areas and throughout the Presidio will be maintained throughout the construction period, which is estimated to last four years or less (see **Exhibit 2-45**).

Exhibit 2-44
Construction Staging Areas – Preferred Alternative



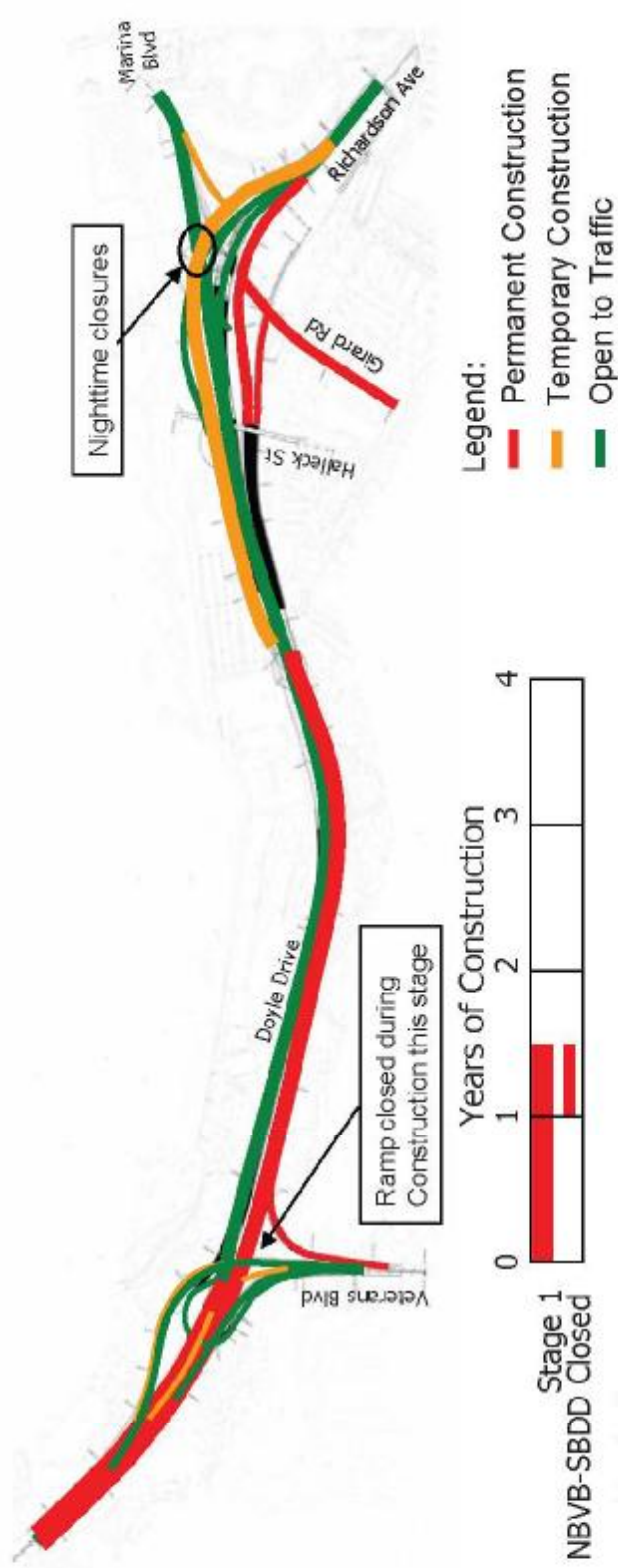
Exhibit 2-45
Construction Duration – Preferred Alternative



NBVD: Northbound Veterans Boulevard
 SBDD Southbound Doyle Drive
 NBDD: Northbound Doyle Drive
 SBVB: Southbound Veterans Boulevard

To minimize ground disturbance, storage of equipment and materials on-site will be limited to the staging and construction areas. The majority of equipment and materials will be transported to the site using designated haul roads during daytime hours to minimize disturbance to the surrounding residential neighborhoods and to conform to the city of San Francisco construction noise ordinance. Access for construction vehicles and equipment will be via Lombard Street and Richardson Avenue from the east; Veterans Boulevard from the south; and the Golden Gate Bridge from the north. Mason Street and Lincoln Boulevard have been identified as haul roads within the Presidio. Additional haul roads, including completed detour roads, will be identified prior to the start of construction. Following construction, all haul roads will be restored to existing conditions, or as defined by the land managing agency. **Exhibits 2-46 through 2-50** on the following pages present schematic staging plans for the Preferred Alternative.

**Exhibit 2-46
Preferred Alternative
Construction Staging – Stage One, Phase One and Two**

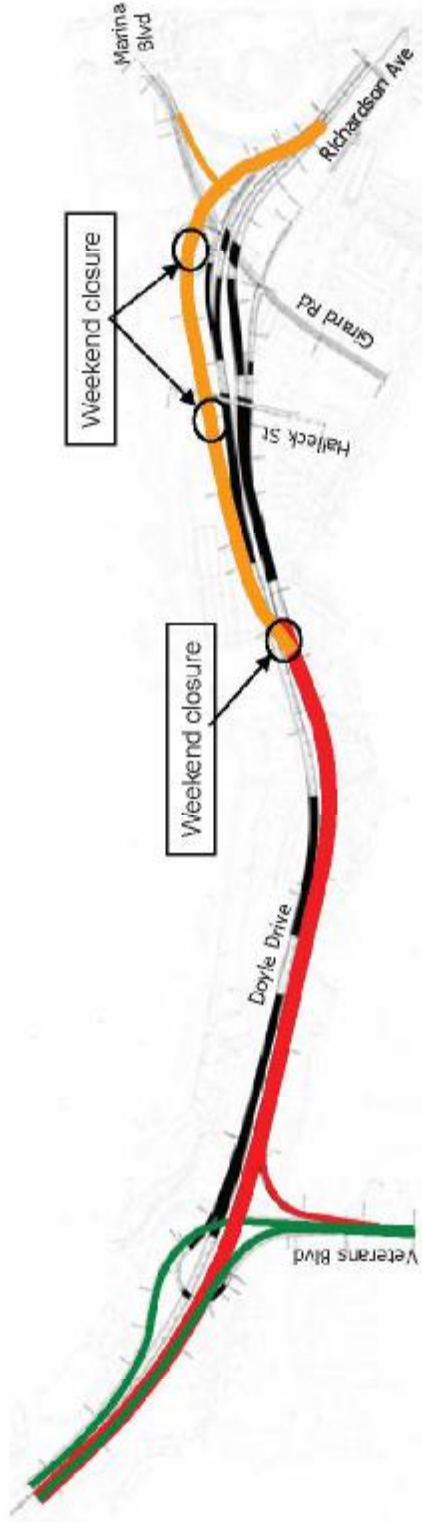


Permanent Construction:
Construct off-line portions of permanent Doyle Drive (DD) including southbound (SB) Battery tunnel portion of SB DD east of Halleck St and portion of the Girard Rd Interchange. Construct permanent Girard Rd alignment south of DD to Lincoln Blvd. Realign portion of Lincoln Blvd at the Park Presidio Interchange. Construct retaining wall and cantilever roadway section adjacent to Building 106. Remove Post Exchange (PX) Building and Buildings 230 and 231. Shift DD traffic onto temporary widening west of Park Presidio Interchange. Construct portion of SB DD. Construct Park Presidio Interchange ramps.

Temporary Construction:
Construct off-line portions of northbound (NB) and SB DD at-grade alignment. Widen NB and SB DD at the Park Presidio Interchange. Construct ramp from existing NB Veterans Blvd (VB) to future NB DD. Construct ramp from existing SB Doyle Drive to SB VB. Construct at-grade connection to Marina Blvd with traffic signal. Widen SB DD east of National Cemetery to accommodate detour traffic.

Detours:
Close Lincoln Blvd from the National Cemetery to building 106 and divert traffic via Washington Ave. Close NB VB to SB DD ramp for a 6 month duration and divert traffic via Geary Blvd and Van Ness Ave.

Exhibit 2-47
Preferred Alternative
Construction Staging – Stage One Transition, Full Weekend Closure



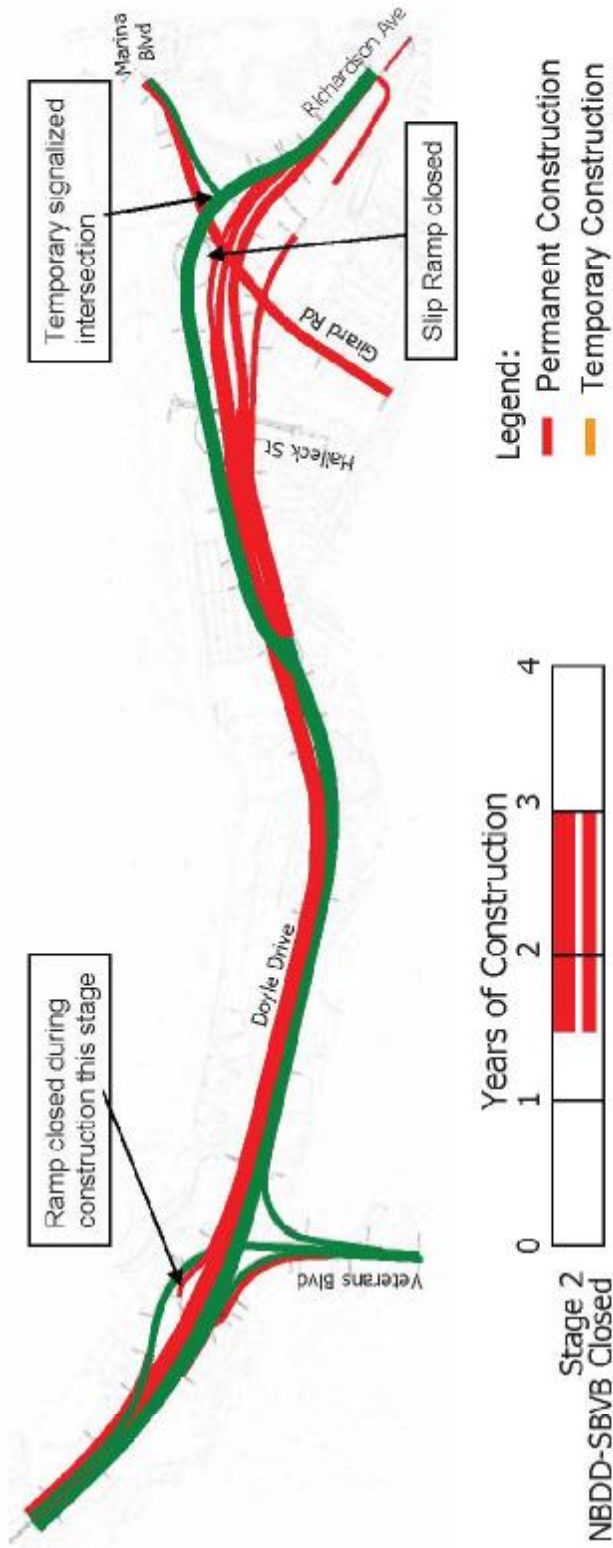
- Legend:**
- █ Permanent Construction
 - █ Temporary Construction
 - █ Open to Traffic

Permanent Construction:
 Remove portion of existing DD and Richardson Ramps conflicting with at-grade temporary roadway. Construct portion of SB DD.

Temporary Construction:
 Complete NB and SB DD at-grade temporary roadway and cross-over section.

Detours:
 Close DD east of Park Presidio Interchange and detour traffic via SB and NB VB, Geary Blvd and Van Ness Ave.

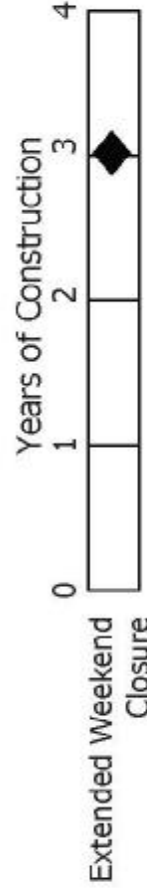
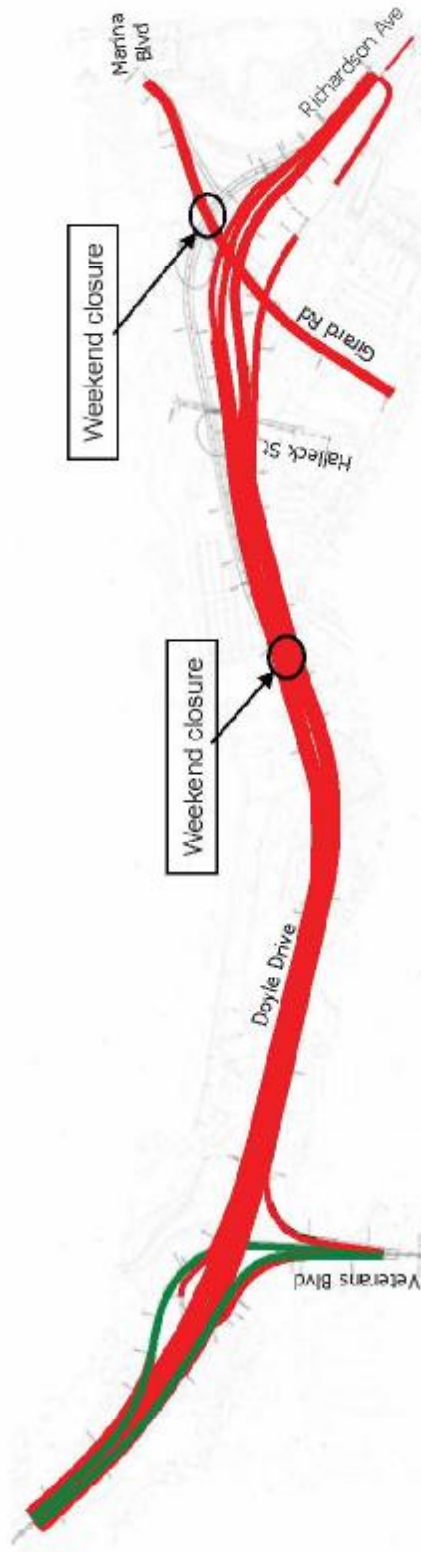
Exhibit 2-48
Preferred Alternative
Construction Staging – Stage Two



Permanent Construction:
 Remove remaining DD east of Park Presidio Interchange. Construct portion of NB DD west and east of the Park Presidio Interchange and NB Battery tunnel. Construct NB and SB DD Main Post Tunnels. Construct Girard Rd to Marina Blvd connection. Complete construction of Girard Rd interchange. Complete construction of the NB DD to SB VB ramp. Remove temporary SB DD ramp to SB VB. Remove temporary ramp from existing NB VB to future NB DD. Remove temporary widening on DD west of Park Presidio Interchange. Shift traffic to permanent ramp from NB VB to NB DD and to permanent ramp from SB DD to SB VB.

Detours:
 Divert NB and SB DD traffic onto permanent SB DD and temporary at-grade roadway. Divert NB and SB Marina traffic onto temporary Marina connection. Divert Halleck St traffic via Lincoln Blvd, McDowell Ave and Mason St. Close existing NB DD to SB VB and detour traffic via Van Ness Ave and Geary Blvd.

Exhibit 2-49
Preferred Alternative
Construction Staging – Stage Two Transition, Full Weekend Closure

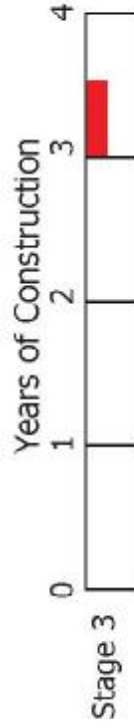
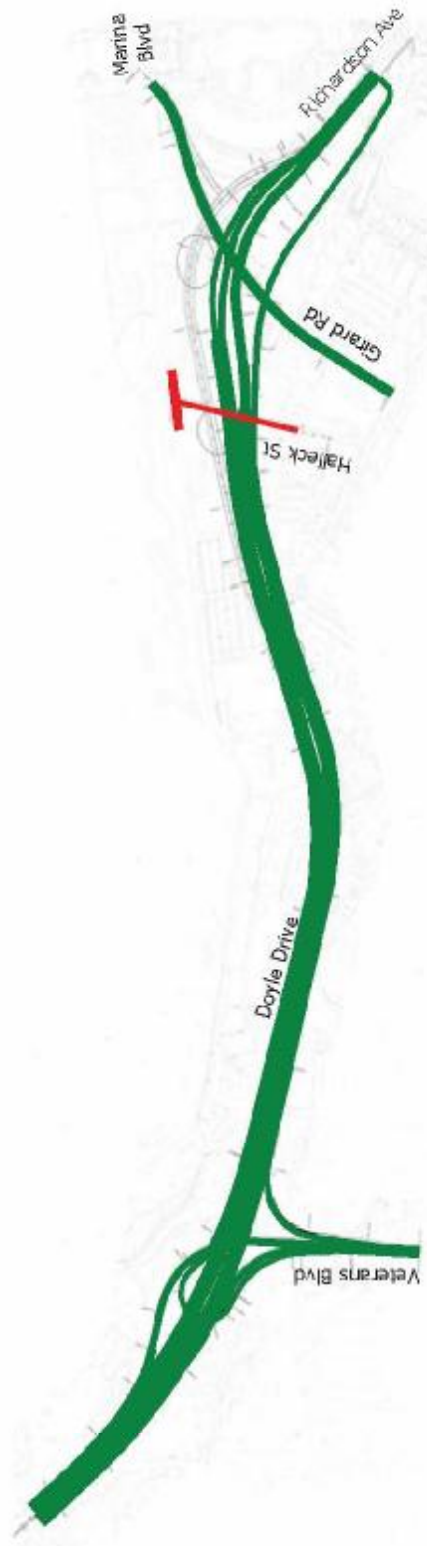


- Legend:**
- █ Permanent Construction
 - █ Temporary Construction
 - █ Open to Traffic

Permanent Construction:
 Complete construction of permanent DD and Girard Rd connection to Marina Blvd.

Detours:
 Close DD east of Park Presidio Interchange and detour traffic via SB and NB VB, Geary Blvd and Van Ness Ave.

**Exhibit 2-50
Preferred Alternative
Construction Staging – Stage Three**



Legend:

- █ Permanent Construction
- █ Temporary Construction
- █ Open to Traffic

Permanent Construction:

Remove SB DD temporary widening at Park Presidio Interchange and the temporary at-grade roadway. Remove temporary Marina connection. Construct Hallett St and complete grading over Main Post tunnels. Open permanent DD, NB DD to SB VB ramp and Grand Rd interchange to traffic. Construct parking area and access roads west of Palace of Fine Arts.

Detours:

Close Lincoln Blvd for bridge removal over roadway and detour traffic via McDowell to Crissy Field Ave to Lincoln and via Storey to Ruckman to Lincoln. Close NB Veterans Blvd for bridge removal over roadway and detour traffic via Geary Blvd to Van Ness Ave to Lombard St. to NB Doyle Drive.

|

2.9.2 Construction Methods

The Preferred Alternative will involve standard construction techniques and require large-scale construction equipment and labor-intensive activities. General activities will include:

- mobilization, clearing of vegetation and removal of existing facilities;
- excavation, grading, stockpiling of rock and soil;
- installation of temporary works such as excavation shoring, temporary supports, falsework and formwork; and
- foundation installation, roadway construction, placement of reinforced concrete, erection of structural steel and precast concrete, fill placement and compaction, landscaping, and demobilization.

Equipment will include concrete saws, concrete breakers and impact hammers, pile drilling and driving rigs, pile hammers, vibratory hammers, bentonite mixing and processing equipment, earth moving equipment, cranes, hydraulic jacks, on-site concrete batching plant, concrete trucks, well-point pumps, and material delivery trucks. Driven piles will only be used in locations where there will be no potential damage to historic structures. Field vibration testing will be conducted during final design to determine the allowable proximity of pile driving to sensitive structures. Quieter operations are achievable by using technologies such as mufflers and other types of noise dampers attached to equipment. Moreover, quiet pile installation technologies were investigated, including the more common vibratory hammer and also a relatively new technology known as the “Silent-Piler”. The Silent-Piler uses the “press-in” method which proved to be very promising and may also be considered for use on the project.

Methods used to construct foundations, tunnels, depressed sections, and retaining walls will include the use of: sheet-piles, tie-back walls, soldier pile walls, cut-off walls (secant pile and diaphragm walls), cast-in-drilled-hole (CIDH) concrete piles, and the similar cast-in-steel-shell (CISS) concrete piles, which differ in that the steel shell that supports the hole will remain as part of the pile structure. Piling will be installed in rock and soil; some locations would require drilling, driving and a combination of the two.

General methods used to construct aerial structures will include the use of; cast-in-place post-tensioned (CIP/PS) concrete, structural steel erection, pre-cast pre-stressed concrete (PC/PS) erection. Specialized overhead construction techniques and special falsework were considered to minimize ground disturbance.

CIDH and slurry walls will use bentonite slurry to maintain the shape of excavations. Bentonite processing plants are typically self contained units located at excavation sites which produce low risk clay slurry (bentonite).

Selection of methods will depend on the type of structure selected during final design and will take into account cost, feasibility of construction, the

construction marketplace, natural environment, and avoidance of cultural resources.

Aerial Superstructures and Substructures

There are several superstructure types under consideration for the aerial structures: the CIP/PS box girder, steel tubular deck truss, steel bolted deck truss steel plate girder and CIP/PS composite box-girder with truss laterals.

The CIP/PS conventional box-girder design is standard in California and requires shorter spans and therefore more support columns. The other structure types allow for longer spans of up to 80 meters (262 feet)

The structure types being considered at various locations along the facility are:

- *Park Presidio Interchange Area.* The structures in this area include a CIP/PS slab viaduct carrying Route 1 and a CIP concrete “U” section ramp that is a closed box passing under Doyle Drive.
- *Highb-Viaduct and Access Ramps.* The superstructure types being considered are: the CIP/PS box girder, steel tubular deck truss, steel bolted deck truss, steel plate girder and CIP/PS composite box-girder with truss laterals.
- *Eastern Bluff at the Battery.* Cut-and-cover CIP concrete tunnel.
- *Main Post Area.* Retaining wall and covered CIP concrete tunnel supported on piles.
- *Tennessee Hollow and Girard Road Area.* The structures in this area include a CIP/PS slab “causeway”, CIP concrete “U” section supported on piles and installed using cut-off walls, retaining walls and a simple span CIP/PS bridge.

Aerial structure foundations will most likely be CIDH or CISS piles approximately 20 meters (65 feet) long and 0.9 to 1.2 meters (3 to 4 feet) in diameter. The installation of piles will require either drilling a hole to a pre-determined depth or driving a casing and removing the soil. A rebar support cage will then be lowered into the center of the hole or casing and concrete poured in, forming the pile. Depending on groundwater levels, full-length casings may be required but if not, the hole will be filled with bentonite slurry to stabilize the walls. This will require a bentonite processing plant on-site to process displaced bentonite as concrete is poured. The slurry will be displaced from the hole as the concrete is placed from a concrete pump truck using concrete delivered from mix trucks or from an on-site plant.

Tunnels

The tunnels will be constructed using the cut-and-cover method. The typical sequence for construction will include:

- excavation to the necessary length and depth;
- installation of required substructures and ground water conveyance systems, and if necessary, installation of waterproof membrane;
- pouring of concrete for the base slabs, walls, and the roof;

- covering the top and sides of the tunnel with a waterproofing membrane; and
- backfilling over the top of the tunnel to create the approved topography.

Because of potential hydrological and biological sensitivity at the eastern bluffs north of the San Francisco National Cemetery, between McDowell Avenue to the west and the eastern edge of the cemetery to the east, further hydrogeologic investigations will be conducted before final design to determine the hydrogeology and extent of groundwater flow. A water transfer concept has been developed that, if necessary, can transfer groundwater around the tunnel without allowing longitudinal flow along the exterior of the concrete walls to maintain wetland vegetation on the northern bluff face. The concept includes high-permeability strip drains to intercept groundwater on the upstream (south) side of the tunnel and transport it around the outside of the tunnel to locations on the downstream (north) side of the tunnel. As part of final design, careful evaluation of subsurface conditions will be undertaken for design and installation of a hydrologic conveyance system.

At the closest point at the National Cemetery, the limit of the tunnel structure will be one meter (three feet) north of the National Cemetery fence line. No tiebacks will be used in this area. However, if necessary a rigid shoring system will be incorporated into the final tunnel wall and designed to minimize any ground movement and avoid the cemetery.

Earthwork

It is anticipated that material excavated during construction of the tunnels will be suitable for reuse as fill in the project corridor. Under the Preferred Alternative, approximately 211,000 cubic meters (276,000 cubic yards) will be excavated and returned as fill. It is estimated that there will be an excess of approximately 207,000 cubic meters (271,00 cubic yards) of material for off-site disposal (see **Exhibit 2-37** presented earlier in this chapter). For reuse of excavated soils in the project corridor, the Trust's thresholds for soil contaminants will be followed.

Bridge Removal

The steel deck truss at the Presidio (High) Viaduct will be removed from the top down within its footprint. The reinforced concrete and steel stringer approaches will be removed similarly. The deck will be removed first, followed by removal of the steel pieces by flame cutting the steel into manageable pieces. Concrete substructures will be removed using breakers. Debris will be sorted and piled and then removed. Dust will be controlled using appropriate dust control measures.

The cast-in-place Marina (Low) Viaduct will generally be removed using breakers. In the areas where vibrations must be controlled, sections will be saw-cut into manageable pieces and lifted onto trucks for breakup in another location. The construction staging requires two extended weekend closures

which will accelerate removal activities in three locations and will require a greater number of equipment pieces and personnel to be employed. The spoils of this activity will be located adjacent to the detour route where final break-up and debris sorting and removal would take place.

Detours

The Preferred Alternative will divert Doyle Drive traffic in the vicinity of the low-viaduct to the north of the existing facility by using an at-grade roadway. A crossover will be built in the vicinity of the Sports Basement (Building 610) and will connect the detour to the partially completed southbound Doyle Drive alignment. The new construction sequence will require two complete weekend shut downs of Doyle Drive. The connections between the Golden Gate Bridge and Veterans Boulevard will remain open during these weekends and additional bus and ferry service would be provided. The first closure will be required to build the crossover. The second closure will be required to demolish the crossover and switch the traffic onto the new Doyle Drive alignment. Prior to the weekend closure, extensive public outreach will be implemented to inform the public of the closure activities. During detailed design the *Transportation Management Plan* (TMP) will be developed in more detail and focus on:

- Disseminating project information to the public through press releases, telephone hotlines, and websites.
- Coordinating with transit agencies to increase service connecting Marin County with the Presidio and Marina District.
- Developing a contingency plan to address specific actions that will be taken to restore or minimize effects on traffic when congestion or delay exceeds original demand estimates due to unforeseen events.

There are typically six components of a TMP: Public Information, Motorist Information, Incident Management, Construction Strategies, Demand Management Strategies, and Alternate Route Strategies. The development of a detailed TMP for the Doyle Drive Project will investigate and consider all of these components. Doyle Drive is a major commuter route and also a popular scenic route. It is therefore critical to implement a TMP that minimizes disruption to commuter traffic, as well as to users of the Park and the Presidio. See **Appendix K** for the Draft TMP.

The proposed temporary roadway will accommodate a total of five lanes of traffic with a moveable barrier separating northbound and southbound Doyle Drive to accommodate peak direction traffic in the morning and in the afternoon. The new detour scheme will allow the entire Main Post tunnel to be constructed off-line and thereby maximize construction efficiency and minimize disruption to the traveling public.

2.9.3 Construction Timing

The preliminary construction staging assumes that a typical construction schedule will be used for the Doyle Drive Project. This will include the scheduling of some activities during hours of low traffic volumes. Low traffic volumes occur on Doyle Drive at night, and on local roads during the middle of the day as well as at night. The purpose of scheduling activities during these hours is to ensure that roadways (in the construction area) are open during the peak traffic times to minimize traffic disruption. The types of construction activities that will likely occur in the hours of low traffic volumes are:

- erection/removal of falsework to permit construction overhead;
- erection/removal of temporary shielding to permit demolition overhead; and
- demolition of structures over minor roads.

Construction activities will consider and mitigate impacts to wildlife within the corridor. Discussion of temporary impacts to wildlife is described in Section 3.4.4.

2.9.4 Temporary Roadway Closures

To accommodate the construction staging for the Preferred Alternative there will need to be planned, short duration closures of the mainline, ramps and local roads. These closures will occur during low traffic volume hours (short-term closure) to minimize impacts to traffic.

Short-term Full Roadway Closure - Doyle Drive

The construction of the Preferred Alternative requires the construction of a temporary at-grade roadway. To transfer traffic on to the at-grade roadway, a crossover would be built in the vicinity of the Sports Basement retail location (Building 610) and would connect the detour to the partially completed southbound Doyle Drive alignment. The construction sequence would require two complete weekend closures of Doyle Drive. The first closure, marking the end of Stage One of construction, would be required to build the crossover to maintain traffic in Stage Two. The second closure, occurring at the end of the second stage of construction, would be required to remove the crossover and switch traffic onto the new Doyle Drive alignment. The proposed temporary roadway would accommodate a total of five lanes of traffic, with a moveable barrier separating northbound and southbound traffic to accommodate peak direction southbound traffic in the morning and northbound in the afternoon. The planned detours would allow the entire Main Post tunnel and Girard Road Interchange to be constructed in one stage, thereby maximizing construction efficiency and minimizing disruption to the traveling public. During Stage Two of the construction of the Preferred Alternative, the Marina Boulevard access would be maintained by a temporary signalized intersection. This would allow southbound Doyle Drive traffic to cross the northbound Richardson Avenue roadway at an at-grade signalized intersection and connect to Marina Boulevard.

Southbound Doyle Drive traffic to Richardson Avenue and westbound Marina Boulevard traffic would be uninterrupted by the signal.

Exhibit 2-51 depicts the anticipated short-term closures and associated construction activities based on the conceptual staging plans developed for this project. In addition, lane closures will be required to erect overhead signs needed for the project. The type and location of signs will be determined during the final design phase.

2.9.5 Long-Term Roadway Closures

The conceptual staging plans also identified the need for long-term closure (greater than one month) for some ramps and local roads. Early in the project, one traffic detour will involve the rerouting of internal Presidio traffic. During the initial stages of construction, Lincoln Boulevard near the National Cemetery is proposed for closure for a three month period. During this time, local traffic will be diverted to Halleck, Mason and McDowell Streets. Another traffic detour will be required when Halleck Street is closed for about a two year period. Halleck Street attracts less than 100 vehicles in each direction at peak hour, so congestion impacts are not anticipated. Impacts to bicyclists and pedestrians will be mitigated by a replacement path connecting Lincoln Boulevard and Mason Street. There will also be two ramps proposed for closure. These are the ramps that connect Veterans Boulevard northbound to Doyle Drive southbound, and Doyle Drive northbound to Veterans Boulevard southbound. It is anticipated that the closure of Veterans Boulevard northbound to Doyle Drive southbound will last between 6 and 12 months and Doyle Drive northbound to Veterans Boulevard southbound ramp will likely be closed for up to 18 months. Some drivers will make their trips on other local streets through the Richmond District, Laurel Heights area, Presidio Heights area, Cow Hollow District, and Marina District. Other drivers will travel up Veterans Boulevard and cut through the Golden Gate Bridge Toll Plaza Visitors' area to continue their trip. Traffic operations for the Toll Plaza area and other local streets will be monitored and maintained as described in the Draft TMP.

Exhibit 2-52 on the following page depicts the long-term closures and associated construction activities. Long-term closures will be phased to maintain major regional movements at all times.

More information regarding anticipated roadway closures is provided in the Draft TMP developed for this Doyle Drive Project (see **Appendix K**).

Exhibit 2-51
Short-Term Roadway Closures During Construction:
Low Traffic Volume Hours

LOCATION OF CLOSURE	PURPOSE OF CLOSURE
Full Weekend Closure Doyle Drive	Construct Temporary Cross-over
Full Weekend Closure Doyle Drive	Remove Temporary Cross-over
Northbound Veterans Boulevard to Northbound Doyle Drive	Temporary Bridge Construction and Removal/Bridge Removal/Falsework
Northbound Doyle Drive to Southbound Veterans Boulevard	Bridge Removal/Falsework
Lincoln Boulevard. at Park Presidio Interchange	Falsework
Crissy Field Avenue	Bridge Removal/Falsework
McDowell Road	Falsework

Exhibit 2-52
Long-Term Roadway Closures

LOCATION OF CLOSURE	PURPOSE OF CLOSURE	DURATION OF CLOSURE
Northbound Doyle Drive to Southbound Veterans Boulevard	Ramp Reconstruction	18 months
Northbound Veterans Boulevard to Southbound Doyle Drive	Ramp Reconstruction	6 – 12 months
Lincoln Boulevard	Mainline Doyle Drive Construction	6 months
Halleck Street	Mainline Doyle Drive Construction and Road Reconstruction	24 months
Javowitz Street	Located Within Detour Alignment	24 months

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CHAPTER THREE

AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND AVOIDANCE, MINIMIZATION AND MITIGATION MEASURES

The purpose of this chapter is to provide a discussion of the environmental and community features within the Doyle Drive Project study area. Potential impacts and proposed mitigation measures, by alternative, are also summarized. Data sources and methodology used for this analysis are briefly discussed with each resource.

Information contained in this *Final Environmental Impact Statement/Report* (FEIS/R) was extracted from environmental technical reports that were prepared specifically for this project.

A detailed listing of sources can be found in Chapter 9, References, while the respective technical reports are available from the San Francisco County Transportation Authority, Caltrans, and the Doyle Drive website (www.doyledrive.org).

3.1 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 conducted by experts using generally available information about the project and its environmental setting. The initial screenings assessed the likelihood that adverse impacts could occur in any of the resource areas identified in the *California Environmental Quality Act* (CEQA), environmental checklist, or Federal Highway Administration (FHWA) *Technical Advisory 6640.8A*, which provides guidance for preparing federal environmental documents.

This chapter covers resource areas where the initial screening identified a possibility for adverse impact or where there was considered to be a high degree of public sensitivity. They are listed in **Exhibit 3-1** on the following page.

Resource areas determined to have no possibility for an adverse impact based on the initial screening are not discussed.

3.2 Human Environment

This Human Environment section examines our communities, our cultural past, and our use of land. The resources reviewed as part of the human environment analysis include: land use; parks and recreation; community impacts; cultural (historic and archeological) resources; traffic and transportation (including

pedestrian and bicycle facilities); relocation; environmental justice; and visual quality. Detailed information about these resources can be found in their corresponding technical reports which were prepared for this project.

3.2.1 Land Use and Planning

The land use resource area discussion consists of an overview of existing land uses and development within the project study area as well as a summary of relevant plans and policies.

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 in order to promote efforts that would prevent or reduce damage to the environment. The President’s Council on Environmental Quality was established to oversee NEPA for all Federal agencies. Following the guidelines of NEPA, this analysis has been prepared in order 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 in order to document the potential impacts of the project on the environment.

Exhibit 3-1 Environmental and Community Resources

<i>HUMAN ENVIRONMENT</i>
<ul style="list-style-type: none"> -- Land Use -- Parks and Recreation -- Growth -- Community Impacts -- Relocation -- Parking -- Environmental Justice -- Traffic, Transportation, and Transit -- Visual and Aesthetics -- Cultural Resources
<i>PHYSICAL ENVIRONMENT</i>
<ul style="list-style-type: none"> -- Hydrology, Water Quality, and Stormwater -- Geology/Soils/Seismic/Topography -- Hazardous Waste/Materials -- Air Quality -- Noise and Vibration -- Energy
<i>BIOLOGICAL ENVIRONMENT</i>
<ul style="list-style-type: none"> -- Natural Communities -- Wetlands and other Waters of the United States -- Plant Species -- Animal Species -- Invasive Species

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 in the Presidio and portions of adjacent neighborhoods.

The project study area consists of the Presidio and a number of adjacent San Francisco neighborhoods. These include the Marina district (west of Broderick Street), which includes the Palace of Fine Arts/Exploratorium area; the Lombard Street corridor (between Chestnut and Greenwich Streets), and Cow Hollow (north of Greenwich Street and west of Broderick Street). The Marina Green, Saint Francis Yacht Club and promenade along Marina Boulevard are important recreational uses in the area adjacent to the project study area. Adjacent to the Presidio, ground floor commercial uses are located along Lombard Street and Lyon Street (between Lombard Street and Greenwich Street). The remaining adjoining land uses are primarily residential.

The inventory of existing land uses was based primarily on information provided in the *Presidio Trust Management Plan* (PTMP). The analysis of land use impact primarily focused on the effects to buildings and parking within the Presidio and the potential effects to the existing and future land use patterns of the designated planning areas.

Presidio Planning Areas and Land Use

The Presidio, under the direction of the National Park Service (NPS) (Area A - coastal) and the Presidio Trust (Area B – interior), has been converted from an active U.S. Army military post to a national park. The buildings within the Presidio, which are part of a National Historic Landmark District (NHL), reveal a number of architectural styles, ranging from brick Colonial Revival to stucco Mission Revival to wood-frame temporary barracks. Throughout the years, many of the buildings have supported different types of uses as the needs of the Army changed. Now that the Presidio is a national park, many buildings are being rehabilitated to support civilian uses, thus changing the land uses.

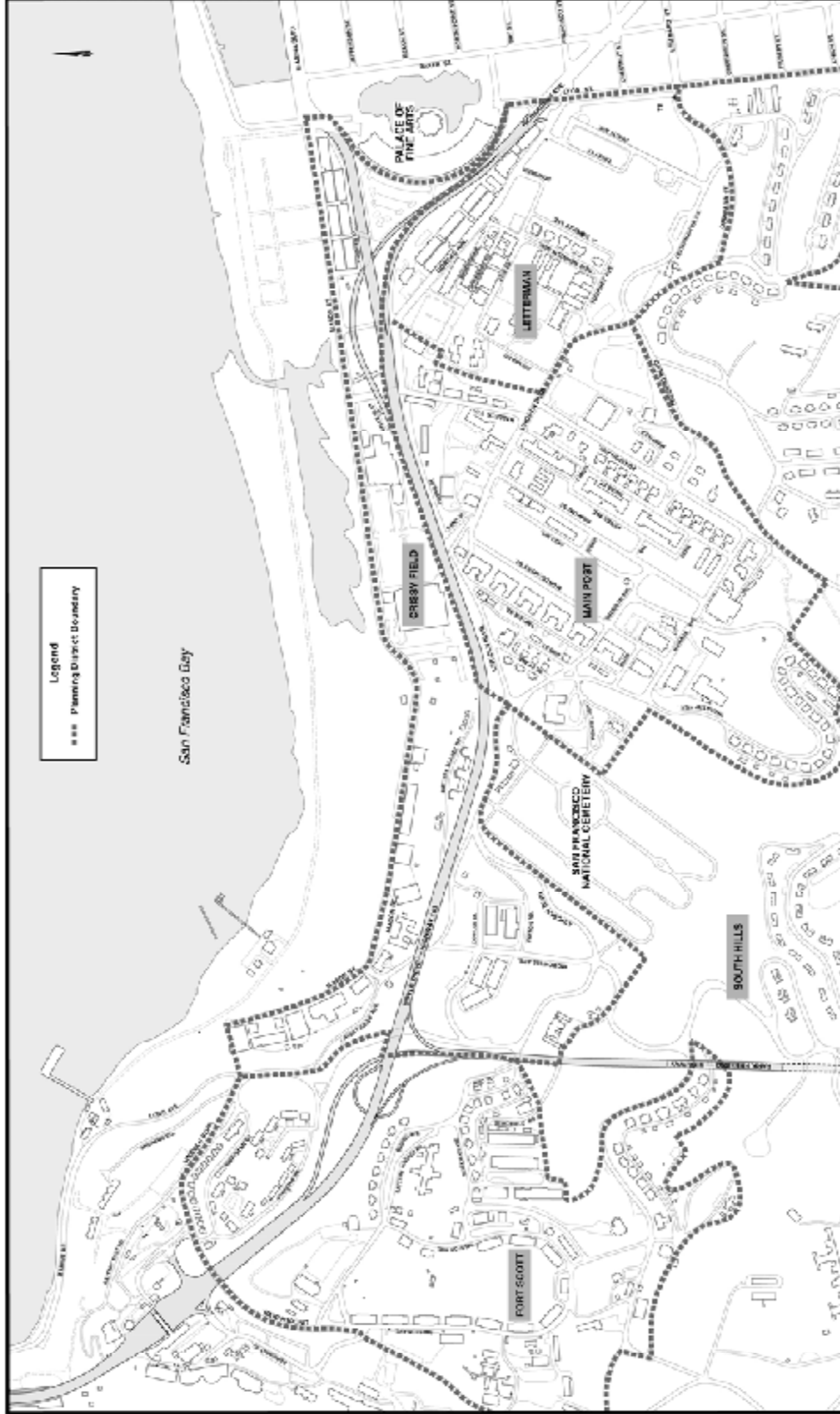
The Presidio is comprised of approximately 603 hectares (1,490 acres) with 473 hectares (1,168 acres) in Area B, and 131 hectares (323 acres) in Area A. Land use within Area B is predominately open space (281 hectares [695 acres]), which includes forest, landscaped areas, wetlands, trails, and the Presidio Golf Course. Approximately 191 hectares (473 acres) of Area B are developed land.

The area defined by the temporary construction limits includes four of the seven planning areas outlined in the PTMP: Crissy Field (Area B); Letterman; Main Post; and Fort Scott (see **Exhibit 3-2** on the following page). See **Exhibit 1-2** in Chapter 1 for specific building locations and identification numbers.

The aforementioned areas contain the following land use categories described in the PTMP (see **Exhibit 3-3** on the following pages):

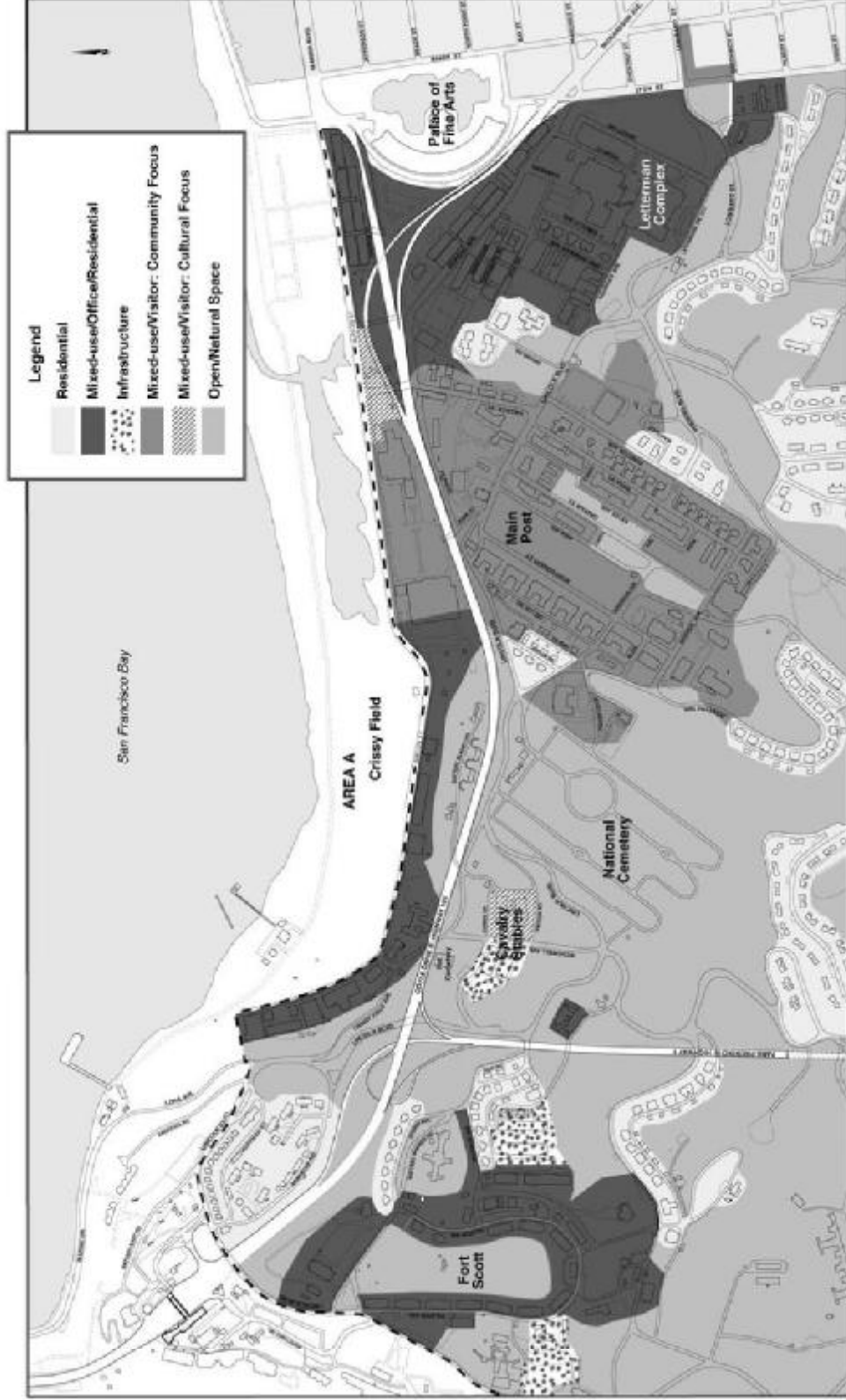
- Mixed-Use/Visitor (Community Focus) – includes a mix of uses devoted to public uses such as museums, small-scale lodging and visitor amenities;

**Exhibit 3-2
Presidio Planning Areas**



Source: Presidio Trust Management Plan, 2002.

Exhibit 3-3 Existing Land Use



Source: Presidio Trust Management Plan, 2002.

South Access to the Golden Gate Bridge - Doyle Drive FEIS/R
Chapter Three: Affected Environment, Environmental Consequences, and Avoidance.
Minimization and Mitigation Measures

- Mixed-Use/Office/Residential – includes a mix of office, warehouse and storage facilities in addition to residences;
- Mixed-Use/Visitor (Cultural (Art) Focus) – includes uses such as educational centers, performing arts facilities, training facilities, and interpretation sites;
- Residential – includes buildings used for housing including, single-family houses, duplexes, apartment complexes, and dormitories;
- Infrastructure – includes utilities and facilities necessary for operation of the Presidio; and
- Open Space/Natural Areas – includes native plant communities, forest, landscape vegetation and disturbed areas.

Four of the main PTMP planning areas and Area A in the Presidio, include the above listed land uses.

Crissy Field

The Crissy Field planning area encompasses approximately 41 hectares (102 acres) and includes the area between Mason Street, Doyle Drive and Lincoln Boulevard. The diverse natural habitats of Crissy Field include bluffs, dunes, grassy areas, and marsh. The area includes dense forest and native plant communities such as bluff scrub, coastal scrub, live oak woodland and serpentine scrub. There are approximately 40 buildings located in the area that is designated as a recreation, educational destination in the PTMP.

Letterman

The approximately 24 hectares (60 acres) Letterman planning area is located just west of the historic Lombard Gate entrance to the Presidio. It is designated as a mixed-use residential and working campus. In early 2002, the Letterman Army Medical Center and Letterman Army Institute of Research buildings were demolished for the construction of the Letterman Digital Arts Center, home of Lucasfilm's subsidiary companies.

The Letterman Digital Arts Center is an office campus consisting of new buildings comprising approximately 78,968 square meters (850,000 square feet) of space in the eastern portion of the planning area. The Digital Arts Center is engaged in research, development and production of digital arts and technologies for use in entertainment, education, communications, and other industries. Also included on the site is an underground garage for approximately 1,500 vehicles, as well as landscaped open space/public garden available for use by park visitors, employees of the Digital Arts Center, other Presidio tenants, and area residents. The area to the west of the Digital Arts Center includes historic buildings and cultural landscape features. It also includes office, residential and some supporting non-residential uses. The Tennessee Hollow forms the western edge of the area.

Main Post

The Main Post planning area encompasses approximately 49 hectares (120 acres) and is located west of the Letterman planning area. Doyle Drive is its northern boundary. The area was historically the center of activity in the Presidio. Many of its 138 buildings are historic. The Main Post is the center of visitor activities, and the NPS Visitor Center and the Trust offices are located in this area. The PTMP designated the Main Post to continue in its role as both a visitor and community center for the Presidio. Preferred land uses in the planning area include office, educational, residential and lodging, service retail, and recreation.

One of the Presidio's primary watersheds is Tennessee Hollow. It runs through the Main Post planning area and feeds the restored Crissy Marsh. The *General Management Plan Amendment* (GMPA) and PTMP recommend that surface drainage and native riparian habitat be re-established within this watershed.

Fort Scott

The Fort Scott planning area is located west of the Park Presidio Interchange and extends west to Lincoln Boulevard along the border with Area A. The planning area is approximately 53 hectares (132 acres) and contains 157 buildings, most of which are historic. The mature canopy forest along the perimeter of the area provides habitat for raptors, migratory songbirds and other bird species. Dragonfly Creek is the only major remnant natural system in the Fort Scott area. In addition, the area contains a variety of historic landscape features such as formal gardens, walkways, vistas, retaining walls, and horticulture plantings. Based on the peaceful setting of Fort Scott, the PTMP has designated the area as ideal for education, conferences, and research with supporting lodging, housing and offices.

Area A

The coastal region of the Presidio is designated as Area A and is under the management of the NPS. Several distinctive features are located within the 131 hectares (323 acres) that comprise Area A, including Crissy Field, Crissy Marsh, Fort Point, and historic batteries.

Development Trends

The Presidio became part of the Golden Gate National Recreation Area (GGNRA) in 1994 when the U.S. Army transferred jurisdiction of the park to the NPS. Since 1998, the park has been managed by both the NPS, which oversees Area A (coastal), and the Trust, which manages Area B (interior). While the two agencies have jurisdiction over separate areas of the Presidio, they engage in many cooperative programs. Under the GMPA, wetlands and natural riparian corridors have been restored including Crissy Marsh. Under guidance of the PTMP many historic buildings have been rehabilitated and adapted for civilian uses. Visitor and public safety services have been established throughout the park. In addition, numerous preservation and rehabilitation efforts for native plant communities, historic forest zones and landscaped vegetation areas have taken place under the guidance of the PTMP. In addition to the recent

completion of the Letterman Digital Arts Center on the site of the former Letterman Hospital, current development activities include: construction of the Richardson Avenue slip ramp, which provides access into the Presidio at Gorgas Avenue from northbound Richardson Avenue; construction of a transit center along Lincoln Boulevard adjacent to the Post Office (Building 210); on-going building rehabilitation; and initial studies for the restoration of the Tennessee Hollow riparian corridor and possible expansion of Crissy Marsh. Riparian corridor restoration is proceeding in an area located between Doyle Drive and Lincoln Boulevard and Halleck Street and Girard Road, the site of a former Army era landfill (Fill Site 6A), which was placed over the historic alignment of the Tennessee Hollow watershed which flowed in a culvert under the landfill. Following the removal of the landfill, the culvert in this area has been removed and the creek was daylighted to return to its natural setting with a mix of native riparian and upland habitat. Ongoing planting efforts are continuing in this newly restored riparian corridor. This site is part of the Tennessee Hollow watershed and ultimately drains to Crissy Marsh.

Under the PTMP, the Presidio would remain primarily open space with its natural, historic, scenic, and recreational resources preserved for public use and enjoyment. Open space would be increased by approximately 40.5 hectares (100 acres) and building space would be decreased over time, primarily by removing non-historic housing in the southern portion of the park. The natural environment would be enhanced, remnant systems preserved and expanded, native plant and wildlife species protected, the historic forest preserved and rehabilitated, and streambed corridors enhanced or restored. Recreational resources and visitor experience opportunities would be enhanced. The total building area in the park would be reduced by approximately 33,445 square meters (360,000 square feet) or more, from the 553,702 square meters (5.96 million square feet) that currently exist to 520,257 square meters (5.6 million square feet) or less.

Nearly one-third of the building space would be set aside for public uses such as visitor centers, lodging, and educational uses. The integrity and historic character of the NHLD would be protected, though over time limited changes in keeping with the park's character would occur. Historic buildings and landscapes that distinguish the NHLD would be rehabilitated and adaptively used. Some new construction would occur, limited to developed areas and compatible with existing structures, to facilitate the rehabilitation and reuse of historic buildings, and to meet other park objectives, including replacement of housing removed to expand open space. Housing demand would be monitored and the supply of housing would not exceed the current count of about 1,650 units. An improved mix of housing types would be achieved through subdivision and conversion of existing buildings, and potential new construction.

Plans and Policies

This section describes the existing plans and policies that pertain to the Doyle Drive Project study area.

Final General Management Plan Amendment (GMPA) and Environmental Impact Statement (1994)

The NPS developed the GMPA for the Golden Gate National Recreation Area in the late 1970s to guide overall management of the park in keeping with its legislative purpose, and the legal and administrative mandates of the NPS. The Final GMPA was approved in 1994 and provides guidelines for management, use, and development of Area A of the Presidio. While the Doyle Drive project lies entirely within Area B managed by the Trust under the *Presidio Trust Management Plan* (see below), the GMPA, when adopted in 1994 as the NPS plan for the entire Presidio (Areas A and B), considered a future Doyle Drive project. The GMPA laid out several objectives specifically related to a future Doyle Drive, including:

- Redesign the Doyle Drive corridor as a parkway rather than a freeway;
- Respect the Presidio's status as a national historic landmark district in redesign options;
- Minimize the effects of noise and other pollution from the parkway on natural areas and recreational qualities at Crissy Field and other areas adjacent to the highway;
- Improve the Presidio entrance and circulation features as part of the Doyle Drive redesign; and
- Maintain the functions that the Doyle Drive corridor serves as part of the regional and city transportation network.

Presidio Trust Management Plan (PTMP): Land Use Policies for Area B of the Presidio of San Francisco (2002)

The PTMP succeeds the GMPA as it applies to Area B, the jurisdiction under the Presidio Trust. The PTMP provides an updated policy framework that balances and conforms to the concepts and principles of the GMPA with the superseding statutory requirements and mandates of the *Presidio Trust Act* (16 U.S.C. § 460bb). The PTMP sets forth land use preferences and development guidelines for seven planning districts. Building on the elements of the GMPA, the PTMP is concerned with improving open space, maintaining compact development patterns, reuse of historic buildings, increasing the diversity of the housing supply, allocating building space for educational activities, and supporting sustainable transportation and infrastructure systems in Area B of the Presidio.

The PTMP provides a set of objectives that would be used to evaluate potential conflicts with the Doyle Drive design alternatives including:

- Minimize short-term and long-term impacts on park resources;
- Provide direct access to the Presidio and ensure an appropriate transition between the Doyle Drive roadway west of the Gorgas Avenue warehouses and city streets, using a minimum amount of park land;

- Maintain Halleck Street as a pedestrian and bicycle route with limited vehicular use;
- Enhance visual and pedestrian connections from the Main Post to Crissy Field; and
- Ensure a viable connection for the Tennessee Hollow drainage to Crissy Marsh.

In addition, each of the planning districts outlined in the PTMP include specific guidelines for incorporation with a reconstruction of Doyle Drive.

- The Letterman District guidelines propose that a new entrance from Doyle Drive into the park should be created. The compatibly designed new entrance from Doyle Drive should serve as the main vehicular entry for tenants and visitors to the Letterman complex. In addition, Gorgas Avenue should serve as a link to Crissy Field and as access for the Letterman complex.
- The guidelines for the Main Post include a call for incorporating an open space connection between the Main Post and Crissy Field as part of the planning for reconstruction of Doyle Drive, improved pedestrian and visual connections between the two areas, and reinforcing the historic connection along Halleck Street.
- The guidelines for the Crissy Field district also include creation of safe and inviting open space connections between the Main Post and Crissy Field as part of a Doyle Drive reconstruction. The guidelines suggest that Doyle Drive should be reconstructed to preserve views to and from the bluffs and Main Post, and maximize views along Halleck Street, Tennessee Hollow, and from the Cavalry Stables. In addition, the guidelines propose reuse of the Commissary (Building 610) as museum space while protecting and restoring the ecological communities on the western bluffs.

Doyle Drive Task Force Report (1993)

The Report of the Doyle Drive Task Force to the San Francisco Board of Supervisors: A Scenic Parkway for the Park identified a concept for a scenic parkway through the Presidio. The parkway concept envisioned three travel lanes in each direction with an additional southbound auxiliary lane between the San Francisco exit of Veterans Boulevard and a new direct access point to the Presidio. The major elements discussed include: improved views within the Presidio, improved access to the Presidio, and improved safety and amenities. The report presented over 30 recommendations for Doyle Drive including:

- 3.6-meter (12-foot) wide traffic lanes, with 2.4-meter (8-foot) wide shoulders on the right side in each direction;
- provide three continuous lanes in each direction between Highway 1 and the split to Richardson Avenue;
- include a fixed center barrier;
- provide direct access between the Presidio and Doyle Drive;

- encourage the use of tunnels and cut-and-cover to mitigate adverse impacts; and
- design to maximize views for motorists, park users, and from nearby neighborhoods.

Presidio Trails and Bikeways Master Plan/Environmental Assessment (2003)

The *Presidio Trails and Bikeways Plan & Environmental Assessment* is the guide for directing the establishment of a network of trails and bikeways which would enhance the public's exploration and experience of the Presidio while also protecting its natural and cultural resources. The plan identifies three basic trail classifications: pedestrian trails, multi-use trails and on-street bikeways. The five principal goals of the plan include:

- enhance public use, access and experience;
- support resource preservation;
- contribute to a comprehensive transportation strategy;
- provide for sustainable design and construction; and
- promote ongoing public involvement through volunteer stewardship.

Proposed trail and bikeway connections that may be affected by the Doyle Drive Project include the Presidio Promenade, the Park Boulevard Trail and the Tennessee Hollow Corridor.

Presidio of San Francisco Vegetation Management Plan (VMP) and Environmental Assessment (1999)

The *Presidio of San Francisco Vegetation Management Plan and Environmental Assessment* (VMP) was prepared in July 1999 to serve as a guide for all the organizations operating within the Presidio and their management of vegetation resources. It is designed to protect and enhance the natural and historical significance of vegetation resources of three broadly defined categories: native plant communities, historic forest and landscape vegetation. The VMP includes four Presidio-wide objectives:

- Increase open space to enhance park values and improve the Presidio's natural and recreational qualities.
- Identify and protect sensitive wildlife species, and restore and maintain their habitats.
- Manage onsite water resources to protect groundwater and surface water resources and natural wetland and riparian values and to efficiently supply water to the Presidio community.
- Protect and enhance existing native plant communities and their remaining habitat by removing threats to native species, repairing damage to habitat and increasing reproductive success.

In addition to the Presidio-wide objectives, specific objectives are provided for the management of each of the vegetation categories. Some of these objectives include:

- Protect and enhance wildlife habitat by expanding habitat for native plants, increase native species and habitat diversity, avoid invasive plant removal in areas of high wildlife value, and avoid disturbance to wildlife habitat during critical times of the year;
- Maintain the forest within the historic forest management zone as a significant historic landscape feature;
- Manage the forest to maintain important visual connections; and
- Retain existing historic landscapes and historic plants whenever feasible.

San Francisco Bay Plan (2003)

The San Francisco Bay Conservation and Development Commission (BCDC) is a state agency with the authority to issue or deny permit applications for placing fill, extracting materials, or changing the use of any land, water, or structure within the San Francisco Bay. The *San Francisco Bay Plan*, adopted in 1968 by BCDC and last amended in 2003, includes the policies to guide future uses of the Bay and shoreline and includes a set of maps which show where the policies should apply to the present Bay and shoreline. *Bay Policy 5c* highlights the policies for Bayfront military installations designated as waterfront parks which includes the Presidio. The policy states that these installations should be developed and managed for recreation uses to the maximum practicable extent consistent with the *Bay Plan Map Policies*.

The Presidio is designated a waterfront park, beach priority use area in the *San Francisco Bay Plan Map 4, Central Bay North*. Included with *Plan Map 4* are two policies specifically directed at the Presidio. *Policy 27* states that the area of the Presidio within the jurisdiction of the NPS should be developed and managed for open space and water-oriented recreational use. The policy also states that Crissy Field marsh should be protected in addition to evaluating the possible need for expansion and improvement to the marsh while preserving cultural resources and recreation use. *Policy 28* states that development within the Presidio Area B should be consistent with *Recreation Policy 5-c* as called for in the PTMP. The policy specifically states that “alterations to Doyle Drive should preserve recreation opportunities within the waterfront park priority use area and preserve existing natural and cultural values or their restoration potential” (BCDC, 2003).

San Francisco General Plan (1996)

The *San Francisco General Plan* establishes general land use goals and objectives for development in the City, but excludes the Presidio, and prescribes policies as steps for achieving the objectives. Although the Presidio is under exclusive Federal jurisdiction and not under jurisdiction of the City, the NPS and Trust seek to minimize possible conflicts between Federal activities and City policies,

and consult with the City to achieve consistency wherever possible. While lacking jurisdiction, the City Planning Commission may review proposals and advise the Presidio on matters of mutual interest.

Building Restoration Phase IIB and III, Palace of Fine Arts (2003)

The Phase IIB and III plan is a full architectural survey and structural analysis of the existing conditions of the Rotunda and Colonnade of the Palace of Fine Arts. In addition, the plan provided preliminary plans for landscape improvements for the Palace grounds. Part of these improvements included new entry dropoff/turnarounds at both the north and south ends of Palace Drive.

Temporary Impacts

Temporary impacts are a result of short term construction activities within the project study area. Temporary impacts to land use are presented on the following pages. There are no temporary impacts on plans and policies. Please refer to the Relocation and Parking sections for further discussion of impacts related to those areas.

Alternative 1: No-Build

Under the No-Build Alternative, no temporary impacts would result.

Alternative 2: Replace and Widen

Within the Crissy Field planning area, construction staging would require the use of the parking lot of the Post Exchange and Commissary for the Replace and Widen Alternative – No-Detour, while the With Detour Option would also require the removal of both the Post Exchange (Buildings 605 and 606) and Commissary (Buildings 610 and 653). Additionally, the With Detour Option would require the temporary removal of four Mason Street warehouses (Buildings 1182, 1183, 1184, and 1185). The removal of these buildings and parking areas would temporarily reduce the available parking and reduce the facilities available for providing uses compatible with the recreational goals in the Crissy Field planning area resulting in a temporary impact to the land use of this area.

Construction staging would also be required with the limits of the Letterman planning area. Staging would require the temporary use of the parking lot between Buildings 230 and 1063. Access to adjacent buildings would be maintained throughout the construction period. This temporary use of the parking area would not impact the overall land use or development pattern of the Letterman planning area.

Alternative 5: Presidio Parkway

Similar to the Replace and Widen Alternative, the Presidio Parkway Alternative would require construction staging sites in both the Crissy Field and Letterman planning areas. Within the Crissy Field planning area, the parking area and Post Exchange buildings would be removed. The removal of these buildings and

parking area would temporarily reduce the available parking and reduce the facilities available for providing uses compatible with the recreational goals of the Crissy Field planning area resulting in a temporary impact to the land use of this area.

Within the Letterman planning area, staging would require the temporary use of the parking lot between Buildings 230 and 1063. Access to adjacent buildings would be maintained throughout the construction period. This temporary use of the parking area would not impact the overall land use or development pattern of the Letterman planning area.

In addition, construction of the Presidio Parkway Alternative would require that Building 106 (Band Barracks) be temporarily vacated during the construction period. The temporary closure of this building would not impact the overall land use or development pattern of the Main Post planning area.

Preferred Alternative: Refined Presidio Parkway

Impacts resulting from the Preferred Alternative would be the same as with the Presidio Parkway Alternative described above.

Permanent Impacts

The analysis of potential land use and planning impacts associated with each alternative has been categorized by geographic area. These geographic areas generally correspond to the planning areas defined in the PTMP and include: Crissy Field, Letterman, Main Post, Fort Scott, and South Hills. In addition, Area A of the Presidio and surrounding San Francisco neighborhoods are examined. This section also describes the analysis of consistency of the proposed project alternatives with plans and policies that govern the study area and specifically highlights the inconsistencies of each alternative with the various plans.

Alternative 1: No-Build

The following permanent impacts have been identified for Alternative 1.

Land Use

No change to the existing or future land uses within the Presidio planning areas would occur under this alternative.

Plans and Policies

This discussion identifies the relationship between the No-Build Alternative and relevant plans and policies.

2002 Presidio Trust Management Plan. The PTMP identifies planning concepts and guidelines for distinct planning areas within the Presidio. The No-Build Alternative would generally be consistent with objectives of the PTMP such as minimizing impacts on park resources, providing direct access to the park (although only in the northbound direction) and maintaining Halleck Street as a

pedestrian and bicycle route. In addition, the alternative would provide enough space to accommodate a viable connection for the Tennessee Hollow drainage to Crissy Marsh although there may be some limits to the functionality of the area as a wildlife corridor due to the width of the structures. The No-Build Alternative would be inconsistent with many of the PTMP guidelines. For example:

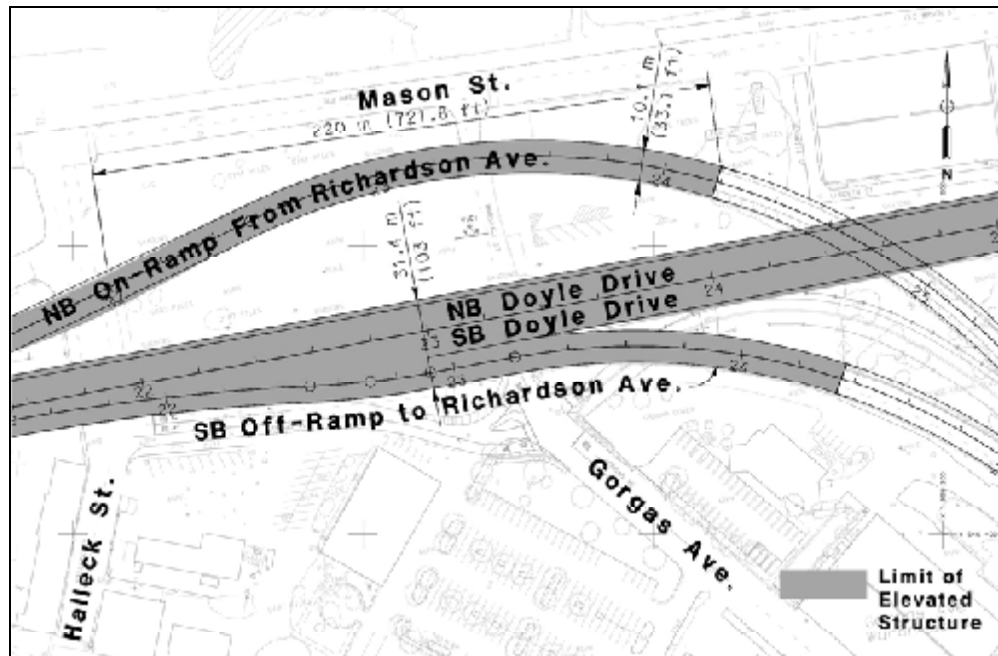
- By maintaining Doyle Drive entirely above grade, opportunities to increase open space and enhance scenic views and vistas would be substantially reduced.
- Although maintaining Doyle Drive above grade would not improve open space connections between Crissy Field (Area B) and other parts of the park (i.e., Main Post, Letterman Center, and Fort Scott), the alternative would maintain the existing access.
- Although the No-Build Alternative would accommodate a viable connection for the Tennessee Hollow drainage to Crissy Marsh there may be some limits to the functionality of the area as a wildlife corridor. Under the No-Build Alternative, the existing low-viaduct mainline structure is between 22.3 meters (73.2 feet) and 31.4 meters (103 feet) wide in the area between Halleck Street and where the southbound Richardson Avenue ramp diverges from the mainline. The length of structure between Halleck Street and the end of the bridge is approximately 240 meters (787 feet) with an elevation varying from 10.2 meters (33.5 feet) to five meters (16.4 feet) to the bottom of the structure. The northbound on-ramp from Richardson Avenue has a width of approximately 10.1 meters (33.1 feet) and an elevation of 10.2 meters (33.5 feet) near Halleck Street which tapers down to an elevation of five meters (16.4 feet) near the west end of the Mason Street Warehouses. The shaded area on **Exhibit 3-4** shows the area available for marsh expansion under the No-Build Alternative.

The dimensions of the existing structures would provide adequate width and height to accommodate a 61 meter (200 foot) riparian corridor and allow for human passage under the structures should a pedestrian trail be part of the restoration plans. The No-Build Alternative would not increase the existing percentage of shade found under the high-viaduct structure but would still have an adverse effect on restoration that attempts to restore shade-intolerant plants. In addition, the wide area beneath the structure would potentially comprise an impediment to wildlife using the restored Tennessee Hollow/Crissy Marsh possible expansion area for movement to and from the existing Crissy Marsh. However, assuming the corridor under the viaduct is designed with natural features such as logs and rocks, the No-Build Alternative would not constrain the use of Tennessee Hollow area as a wildlife corridor for terrestrial wildlife, although some birds would be unlikely to pass through.

1994 General Management Plan Amendment Environmental Impact Statement. The No-Build Alternative would be consistent with two GMPA objectives for Doyle Drive, respect the Presidio's status as a national historic landmark and maintain the function of Doyle Drive as part of the regional and city transportation system and the GMPA Planning Area Concepts for Area A. Inconsistencies with the GMPA are:

- The No-Build Alternative would not redesign Doyle Drive as a parkway.
- The No-Build Alternative would not minimize the effects of noise and other pollutants on the park.
- There would be no improvement to the Presidio entrance and circulation features of Doyle Drive.

Exhibit 3-4
No-Build Alternative
Area Available for Marsh Restoration



Doyle Drive Task Force Report. The No-Build Alternative would be inconsistent with the report recommendations since there would be no improvements or changes to the existing Doyle Drive.

Presidio Trails and Bikeways Master Plan & Environmental Assessment. The No-Build Alternative is consistent with the overall goals of these documents. The alternative would not have an effect on existing or proposed trails and bikeways in the Presidio and would accommodate the goals and objectives of the plan.

Presidio of San Francisco Vegetation Management Plan (VMP) and Environmental Assessment. The No-Build Alternative would be inconsistent with the following two objectives in the VMP:

- The Alternative would not increase open space to enhance park values and improve the Presidio's natural and recreational qualities, although it does not preclude the expansion of open space within the park.
- The Alternative would not create opportunities for restoration of wildlife habitats, although it does not preclude the potential restoration of wildlife habitat.

San Francisco General Plan. The No-Build Alternative would be inconsistent with the Environmental Protection Element and Recreation and Open Space Element of the *San Francisco General Plan*. While the alternative would not substantially change existing conditions within the Presidio, it is inconsistent with *General Plan* policies because the alternative:

- Does not implement changes that would promote the preservation of additional open space or the natural character of the Presidio.
- Would not improve existing conditions for development of mass transit, slow traffic or reduce transportation noise.
- Would be inconsistent with the Transportation Element because it does not meet the *General Plan* design guidelines for Doyle Drive which calls for the road to be improved for greater safety and minimal conflict with the recreational and scenic values of the Presidio, although it would maintain the six lane design capacity.

San Francisco Bay Plan. The No-Build Alternative would be consistent with the *San Francisco Bay Plan*. It would not affect the shoreline or undeveloped areas of the Presidio nor would it discourage use of the shoreline recreation areas. The No-Build Alternative would accommodate an expansion of Crissy Marsh as in *Bay Plan* Map 4 Policy 27.

Building Restoration Phase IIB and III, Palace of Fine Arts. The No-Build Alternative would be consistent with the restoration plans for the Palace of Fine Arts.

Alternative 2: Replace and Widen

The following permanent impacts have been identified for Alternative 2. The Replace and Widen Alternative involves replacing an existing roadway along the same corridor without expanding capacity and does not include the introduction of any new land uses to the Presidio. Implementation of the Replace and Widen Alternative would require the conversion of an additional 0.9 hectares (2.2 acres) of land along the Doyle Drive corridor for the No-Detour Option and 0.6 hectares (1.5 acres) of land for the With Detour Option for permanent to additional right of way for the facility. This minor reduction in overall land area to replace an existing roadway would not impact the larger Presidio-wide land use and development goals outlined in the PTMP.

Land Use

Crissy Field. Construction of the Replace and Widen Alternative – With Detour Option would require the permanent removal of four buildings: Buildings 605 and 606 (Post Exchange), and 610 and 653 (Commissary). The removal of these buildings would result in the loss of approximately 13,200 square meters (142,000 square feet) of building space in the Crissy Field planning area and would be in conflict with the development goals of the Crissy Field planning area which call for an increase of 2,787 square meters (30,000 square feet) of building space. The removal of these non-historic buildings would result in an adverse effect on the land use and development of the Crissy Field planning area due to the permanent loss of space available for providing uses compatible with the recreational goals in the area. This is particularly evident with the removal of Building 610 (Commissary), which is designated in the PTMP for reuse as a museum (although other potential sites for museum facilities are identified in the PTMP including the former aircraft hangers along the western portion of Crissy Field).

The Replace and Widen Alternative would not constrain the study area for possible future expansion of Crissy Marsh. The Replace and Widen Alternative would fail to provide a safe and inviting connection between Crissy Field and the Main Post area as called for in the PTMP. Nor would it improve the views to and from Crissy Field.

Letterman. Under the Replace and Widen Alternative - No-Detour Option, Building 1158 (Mercantile Specialty Store) would be permanently removed. The removal of 387 square meters (4,166 square feet) of building space would be in conflict with the PTMP which calls for an increase of 12,077 square meters (130,000 square feet) in building space. Currently, Building 1158 houses the Presidio Dance Theatre. The removal of this non-historic building would not severely impact overall land use of the Letterman planning area as the area would still function as a compact mixed-use office and residential area.

Implementation of the Replace and Widen Alternative would result in a change in access to the Letterman area. Direct access from northbound Doyle Drive to the Letterman area would no longer be available. Northbound vehicles would have to access the Presidio from Doyle Drive via the off-ramps to Merchant Road at the Golden Gate Bridge Toll Plaza and use Lincoln Boulevard to access the Letterman area. Pedestrian and vehicular circulation patterns within the planning area would remain as they currently are.

Main Post. The Main Post planning area would continue to serve as a focal point and visitor/community center for the Presidio. The Replace and Widen Alternative would accommodate the proposed rehabilitation of Tennessee Hollow. As previously stated, the alternative would fail to provide an open space connection between the Main Post and Crissy Field as called for in the PTMP.

Fort Scott. Under the Replace and Widen Alternative, no land use impact would occur to the Fort Scott area.

Area A. Under the Replace and Widen Alternative, no land use impact would occur in Area A of the Presidio.

San Francisco Neighborhoods. Under the Replace and Widen Alternative, no land use impact would occur to the neighborhoods adjacent to the Presidio.

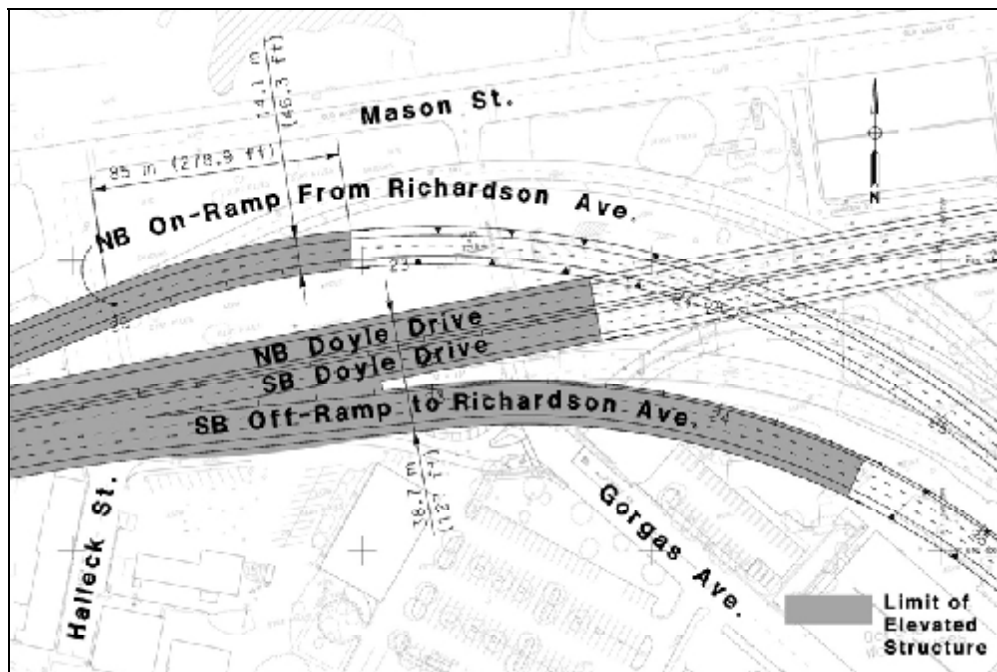
Plans and Policies

2002 Presidio Trust Management Plan. The PTMP identifies planning concepts and guidelines for distinct planning areas within the Presidio. The Replace and Widen Alternative would generally be consistent with the PTMP objective of maintaining Halleck Street as a pedestrian and bicycle route. In addition, the alternative would provide enough space to accommodate a viable connection for the Tennessee Hollow drainage to Crissy Marsh although there may be some limits to the functionality of the area as a wildlife corridor due to the width of the structures. The Replace and Widen Alternative would be inconsistent with several of the PTMP guidelines including:

- Implementation of the Replace and Widen Alternative would result in short-term and long-term impacts on park resources.
- The Replace and Widen Alternative would not provide direct access to the Presidio.
- By maintaining Doyle Drive entirely above grade, opportunities to increase open space and enhance scenic views and vistas would be substantially reduced.
- Although maintaining Doyle Drive above grade would not improve open space connections between Crissy Field (Area B) and other parts of the park (i.e., Main Post, Letterman Complex, and Fort Scott), the alternative would maintain the existing access.
- Although the Replace and Widen Alternative – No-Detour Option would not require removal of the Commissary (Buildings 610 and 653), the Replace and Widen Alternative – With Detour Option would require the removal of the Commissary in order to accommodate the temporary detour structure. This would conflict with the PTMP desire to use the Commissary as a museum.
- Although the Replace and Widen Alternative would accommodate a viable connection for the Tennessee Hollow drainage to Crissy Marsh there may be some limits to the functionality of the area as a wildlife corridor. Under the Replace and Widen Alternative – No-Detour Option (this option provides the worst case scenario of the two options), the low-viaduct mainline structure is between 25 meters (82 feet) and 38.7 meters (127 feet) wide in the area between Halleck Street and where the mainline crosses over the northbound Richardson Avenue on-ramp. The length of structure between these two points is approximately 160 meters (525 feet) with an elevation of approximately 11 meters (36.1 feet) to the bottom of the structure. The southbound off-ramp to Richardson Avenue is 15.9 meters (52.2 feet) wide with an elevation of 11.4 meters (37.4 feet) just past Halleck Street to 6.5

meters (21.3 feet) at the abutment near the Gorgas Warehouses. The length of structure between these two points is 240 meters (787.4 feet). The northbound on-ramp from Richardson Avenue has a width of approximately 14.1 meters (46.3 feet) and an elevation of ten meters (32.8 feet) just east of Halleck Street which tapers down to an elevation of 6.3 meters (20.7 feet) at the end of the bridge. The shaded area on **Exhibit 3-5** shows the area available for marsh expansion under the Replace and Widen Alternative.

Exhibit 3-5
Replace and Widen Alternative – No-Detour Option
Area Available for Marsh Restoration



The dimensions of the Replace and Widen Alternative structures would provide adequate width and height to accommodate a 61 meter (200 foot) riparian corridor and allow for human passage under the structures should a pedestrian trail be part of the restoration plans. However, the increased width of the structures associated with the Replace and Widen Alternative would cast approximately 22 percent and 18 percent (for the No-Detour and With Detour Options, respectively) more full shade on a future marsh expansion area than the No-Build Alternative. This increase in shade would have an adverse effect on restoration that attempts to restore shade-intolerant plants. The new viaducts would potentially comprise an impediment to wildlife using the restored Tennessee Hollow/Crissy Marsh possible expansion area for movement to and

from the existing Crissy Marsh. However, assuming that the corridor under the new viaducts is designed with natural features such as logs and rocks, it is concluded that the Replace and Widen Alternative would not constrain the use of the Tennessee Hollow area as a wildlife corridor for terrestrial wildlife, although some birds would be unlikely to pass through. A more detailed discussion of the shade analysis can be found in Appendix B of the *Final Community Impact Assessment* (August 2005).

1994 General Management Plan Amendment Environmental Impact Statement. The Replace and Widen Alternative would be consistent with two GMPA objectives for Doyle Drive: respect the Presidio's status as a national historic landmark; and maintain the function of Doyle Drive as part of the regional and city transportation system and the GMPA Planning Area Concepts for Area A. Inconsistencies between the Replace and Widen Alternative and GMPA include:

- The alternative would not redesign Doyle Drive as a parkway.
- It would not minimize the effects of noise and other pollutants on the park.
- It would not provide a new Presidio entrance.

Doyle Drive Task Force Report. Although the Replace and Widen Alternative would be consistent with some engineering recommendations in the *Doyle Drive Task Force Report*, such as three continuous 3.6-meter (12-foot) lanes in each direction, it would be inconsistent with the overall design recommendations for a parkway, including:

- This alternative would not use tunnels and cut-and-cover to mitigate adverse impacts.
- It would not maximize views for park users or from nearby neighborhoods.
- This alternative would not minimize the height of the Doyle Drive vertical structures.
- It would not provide an interchange so that Doyle Drive traffic can enter the Presidio directly, instead of traveling through surrounding neighborhoods.

Presidio Trails and Bikeways Master Plan & Environmental Assessment. The Replace and Widen Alternative is consistent with this plan. This alternative would also accommodate the goals and objectives of the plan by allowing implementation of any alternative. The Replace and Widen Alternative would maintain access by allowing pedestrians and bicyclists to cross over or under the Doyle Drive facility at numerous locations. The completed Replace and Widen Alternative would accommodate those trail corridors (Tennessee Hollow Trail, Park Boulevard Trail, and Presidio Promenade Trail) which cross under the Doyle Drive structure.

Presidio of San Francisco Vegetation Management Plan (VMP) and Environmental Assessment. The Replace and Widen Alternative would be inconsistent with several key objectives in the VMP:

- The Alternative would not increase open space to enhance park values and improve the Presidio's natural and recreational qualities, although it does not preclude the expansion of open space within the park.
- The Alternative would not restore and maintain wildlife habitats, although it does not preclude the potential restoration of wildlife habitat.
- Implementation of the alternative would not maintain the forest within the historic management zone and retain existing historic landscapes and plants, since it would require removal of approximately three hectares (7.4 acres) of tree cover, primarily near the Park Presidio Interchange.

San Francisco General Plan. The Replace and Widen Alternative would be inconsistent with the Environmental Protection Element and Recreation and Open Space Element of the *San Francisco General Plan*. While the alternative would not substantially change existing conditions within the Presidio, it is inconsistent with several plan policies:

- The alternative does not implement changes that would promote the preservation of additional open space or the natural character of the Presidio.
- The alternative does not eliminate non-recreational uses or improve existing conditions for development of mass transit, slow traffic or reduced transportation noise.
- The Replace and Widen Alternative would be partially inconsistent with the Transportation Element because while it does improve the safety of Doyle Drive, it does not minimize conflicts with the scenic values of the Presidio.
- The alternative would require an additional auxiliary lane to meet the safety goals which would make it inconsistent with the design guideline calling for a maximum of six lanes.

San Francisco Bay Plan. The Replace and Widen Alternative would not affect the shoreline or undeveloped areas of the Presidio nor would it discourage use of the shoreline recreation areas. This alternative would improve open space connections between the north and south sides of Doyle Drive. The Replace and Widen Alternative would maintain the existing access to the shoreline from within the Presidio and improve safety of the roadway. The alternative would also accommodate a possible expansion of Crissy Marsh as called for in *Bay Plan Map 4 Policy 27*.

Building Restoration Phase IIB and III, Palace of Fine Arts. The Replace and Widen Alternative would be consistent with the restoration plans for the Palace of Fine Arts.

Alternative 5: Presidio Parkway

The Presidio Parkway Alternative involves replacing an existing roadway along the same corridor without expanding capacity and does not include the introduction of any new land uses to the Presidio. Implementation of the Presidio Parkway Alternative would require the conversion of additional

parkland along the Doyle Drive corridor to additional right of way for the facility. The amount of land required would vary depending on the various design options. The Diamond Option with the Loop Ramp would require 4.6 hectares (11.4 acres), while the Hook Ramp would require 4.1 hectares (10.1 acres). The Circle Drive Option with the Loop Ramp would require 4.5 hectares (11.1 acres), while the Hook Ramp would require 3.9 hectares (9.6 acres). Should the Merchant Ramp option be selected, it would require an additional 0.5 hectares (1.2 acres) of land. The majority of land to be converted to a transportation use is in areas currently designated as open space/natural. Other areas designated as mixed-use/visitor focus/office would also be converted. This reduction in overall land area to replace an existing roadway would not impact the larger Presidio-wide land use and development goals outlined in the PTMP but as discussed below the removal of various buildings would be in conflict the development plans of several PTMP defined planning areas and there would be limitations to the space available for the marsh restoration efforts.

Land Use

The following discussion focuses on land use and buildings within the Presidio. **Exhibit 1-2** and the figures in **Appendix B** illustrate the location of buildings in the Presidio including the buildings discussed in this section.

Crissy Field. The Presidio Parkway Alternative would require the permanent removal of 4,711 square meters (50,704 square feet) of building space in the Crissy Field planning area. The removal of this building space would be in conflict with the development goals of the Crissy Field planning area which call for an increase of 2,787 square meters (30,000 square feet) of building space. Buildings removed include Buildings 605 and 606 (Post Exchange) and 670 (Cable House). Proposed development plans identified in the PTMP, including re-use of Building 610 (Commissary) as a museum, rehabilitation of Building 650 (Stilwell Hall), implementation of educational uses at the Cavalry Stables, and possible expansion of Crissy Marsh, would not be precluded by the Presidio Parkway Alternative. The area over the two tunnels would provide a new visual and open space connection between Crissy Field and the Main Post area as called for in the PTMP.

The Presidio Parkway Alternative reduces the area into which Crissy Marsh could expand to the east of the Commissary. This area is shown for proposed marsh expansion in the GMPA, the original Crissy Marsh study, and it is identified in the current *Crissy Marsh Expansion Study* as part of the historic marsh footprint and as part of area that is under consideration for future marsh expansion.

Letterman. Under the Presidio Parkway Alternative, Building 1158 (Mercantile Specialty Store) would be permanently removed. The removal of 387 square meters (4,164 square feet) of building space would be in conflict with the PTMP which calls for an increase of 12,077 square meters (130,000 square feet) in building space. Currently, Building 1158 houses the Presidio Dance Theatre.

The removal of this non-historic building would not severely impact the overall land use of the Letterman planning area as the area would still function in its role as a compact mixed-use office and residential area.

The Circle Drive Option would also require the permanent removal of the YMCA swimming pool (Building 1151) and would result in the loss of an additional 1,190 square meters (12,809 square feet) of building space. The removal of this building would result in the loss of a recreational feature within the Letterman planning area but would not limit the overall land use and development of the area.

There would be modifications to the circulation patterns of the area as Girard Road would be extended to form a new interchange with the Doyle Drive off-ramp and Gorgas Road. In addition, Palace Drive would be reconfigured to a one-way street with direct access from Richardson Avenue. The reconfigured roadways would result in the removal of several surface parking lots which would be replaced by an underground parking facility located between the Mason Street warehouses and Gorgas Street warehouses. The changes in circulation would improve access to the Letterman area and improve pedestrian and vehicular access between the Presidio and Palace of Fine Arts. The new entrance to the park would be in compliance with the PTMP guidelines for the Letterman planning area.

Main Post. Under the Presidio Parkway Alternative approximately 3,500 square meters (37,625 square feet) of building space would be permanently removed, which would be in conflict with the PTMP which calls for an increase of 8,361 square meters (90,000 square feet) of building space in the Main Post planning area. The five buildings removed include, Buildings 201 (Exchange Store), 204 (Exchange Store), 205 (Sewage Pump House), 230 (NPS/Trust Archaeology Lab), and 231 (Exchange Gas Service Station). The removal of Building 201 would impact the historic connection along Halleck Street although the street would still remain as a vital connection between the Main Post and Crissy Field. Although Buildings 204, 230, and 231 are not specifically designated for reuse as a key land use (cultural, educational, office, or residential) in the PTMP, their removal along with Building 201 and 205 would result in an impact to the overall land use of the Main Post planning area. The Presidio Parkway Alternative would accommodate the proposed rehabilitation of Tennessee Hollow through the Main Post.

Fort Scott. Under the Presidio Parkway Alternative there is the potential for permanent removal of four buildings in the Fort Scott planning area. These buildings would only be removed should the Merchant Road Slip Ramp Option be used. The four residential buildings (Buildings 1253, 1254, 1255 and 1256) are located along Armistead Road. The removal of these buildings would remove 805 square meters (8,664 square feet) of building space in the Fort Scott planning area. The loss of building square footage would be an impact of the proposed development plans outlined in the PTMP for the Fort Scott planning area which calls for an increase of 9,290 square meters (100,000 square feet) in

building space. Numerous housing units are available in the immediate surrounding area of this northern part of Fort Scott planning area and additional housing is also available in the southern portion of the planning area along Storey Avenue, Ruckman Road and Kobbe Avenue. The implementation of the Merchant Road Slip Ramp would provide direct access to the Golden Gate Bridge Visitor's Center and direct access between Doyle Drive and the Fort Scott area of the Presidio without entering the Toll Plaza area.

Area A. There would be no impact to the land uses of Area A associated with the implementation of the Presidio Parkway Alternative although the Merchant Road Slip Ramp Option would be partially located in Area A. The Slip Ramp Option would provide a connection from northbound Doyle Drive to Merchant Road which is located in Area A. Existing uses would be maintained and planned development would not be hindered, including the expansion of Crissy Marsh, although the area into which the marsh could expand to the east of the Commissary would be reduced.

San Francisco Neighborhoods. There would be no impact to the land uses of the surrounding San Francisco neighborhoods associated with the implementation of the Presidio Parkway Alternative.

Plans and Policies

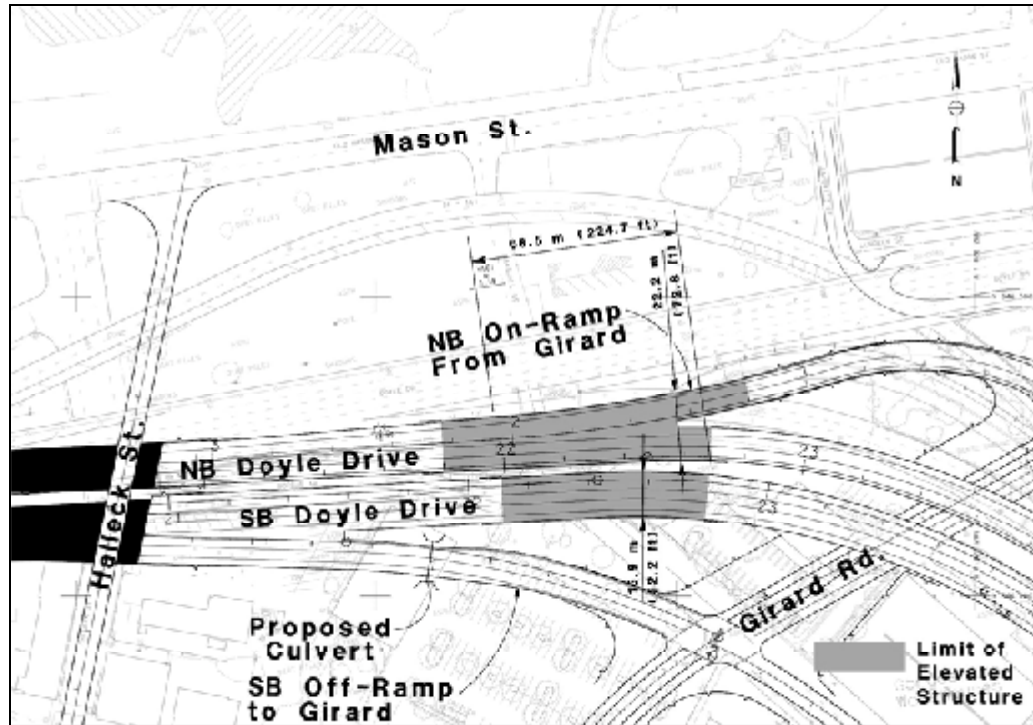
2002 Presidio Trust Management Plan. The Presidio Parkway Alternative would generally be consistent with objectives of the PTMP such as providing direct access to the Presidio, maintaining Halleck Street as a pedestrian and bicycle route, and enhancing the visual and pedestrian connections from the Main Post to Crissy Field. Although the Presidio Parkway Alternative would accommodate a connection for the Tennessee Hollow drainage to Crissy Marsh, the lack of open area under the southbound Girard Road off-ramp would require Tennessee Hollow to pass through a culvert at this location. It would not allow for an open, fully functioning riparian and wildlife corridor. The Presidio Parkway Alternative would be inconsistent with the following PTMP land use and planning policies:

- Implementation of the Presidio Parkway Alternative would result in short-term and long-term impacts on park resources.
- Balanced Use of Building Space – The Presidio Parkway Alternative would not be consistent with this policy since it would require the permanent removal of Buildings 605 and 606 in the Post Exchange/Commissary area, Building 1158 in the Gorgas warehouses area, Buildings 201, 204, 205, 230 and 231 in the Main Post – North Halleck area, and Building 670 in the Cavalry Stables area. If the Circle Drive Option is implemented, Building 1151 in the Gorgas warehouses area would also be permanently removed. The Merchant Road Slip Ramp Option would require the removal of four residential buildings (Buildings 1253 – 1256) along Armistead Road.
- The Presidio Parkway Alternative would not be consistent with the PTMP objective to preserve and enhance the historical resources of the Presidio.

- The Presidio Parkway Alternative would not be consistent with the PTMP objective to ensure a viable connection for the Tennessee Hollow drainage to Crissy Marsh. Under the Presidio Parkway Alternative with the Diamond Interchange Option, the width of the combined southbound Doyle Drive/southbound Girard road off-ramp structure varies between 24.8 meters (81.4 feet) at a point just east the Main Post Tunnel portal to 28 meters (91.9 feet) at the point where the ramp and mainline diverge. Past the diverge, the southbound Girard Road off-ramp width varies from nine meters (29.5 feet) to 11.4 meters (37.4 feet). The width of the mainline east of the diverge is 15.9 meters (52.2 feet). The minimum elevation of the structures (as discussed in Chapter 2) is based on 100-year tsunami elevation design criteria which require a minimum 3.4 meters (11.2 feet) elevation to the bottom of the structure. This minimum elevation is achieved at a location approximately 54 meters (177.2 feet) east of the diverge. The maximum elevation of the bottom of the mainline structure (5 meters, or 16.4 feet) occurs at the east end of the structure. The length of southbound mainline structure between these two points is 68.5 meters (224.7 feet). Because the entire profile of the southbound off-ramp to Girard Road is completely below the 3.4 meter (11.2 feet) tsunami elevation no opening would be possible underneath this structure. The width of the combined northbound Doyle Drive/northbound Girard Road on-ramp structure varies from 15.3 meters (50.2 feet) at a point just east the Main Post Tunnel portal to a width of approximately 22.2 meters (72.8 feet) at the point where the ramp and mainline diverge. Past the diverge the northbound Girard Road on-ramp is nine meters (29.5 feet) wide and the mainline is 10.6 meters (34.8 feet) wide. This minimum tsunami criteria elevation occurs at a point approximately 80 meters (262.5 feet) east of the beginning of the bridge. The maximum elevation of the bottom of the structure is 5.4 meters (17.7 feet) along the mainline at a point just past the diverge with the northbound ramp. The length of structure between these two points is 81 meters (265.7 feet). The shaded area on **Exhibit 3-6** shows the area available for marsh expansion under the Presidio Parkway Alternative.

As stated above, due to the 100-year tsunami design criteria, the Presidio Parkway Alternative would be unable to accommodate a complete open riparian corridor connection between Tennessee Hollow and Crissy Marsh. Due to the lack of necessary elevation at the southbound Gorgas Road off-ramp, Tennessee Hollow would have to be placed in a culvert to convey any flow under the ramp and connect with the expanded marsh on the north side of the ramp. Therefore, a fully functioning riparian and wildlife corridor with a 61 meter (200 feet) minimum width would not be viable in this area. In addition, the limited elevation of the southbound off-ramp would preclude the placement of a pedestrian trail in that area. The area north of the southbound Girard Road off-ramp, including the southbound mainline and northbound Doyle Drive/northbound Girard Road on-ramp would have the necessary dimensions to accommodate the marsh expansion.

Exhibit 3-6
Presidio Parkway Alternative
Area Available for Marsh Restoration



1994 Presidio General Management Plan Amendment. The Presidio Parkway would be consistent with the Doyle Drive specific policies set forth in the GMPA and the GMPA Planning Area Concepts for Area A.

Doyle Drive Task Force Report. The Presidio Parkway Alternative would be consistent with the report recommendations since it would improve the existing Doyle Drive with many features included in the proposed parkway concept.

Presidio Trails and Bikeways Master Plan & Environmental Assessment. The Presidio Parkway Alternative is consistent with this plan by improving public access to the Presidio, improving traffic safety for motorists, bicyclists and pedestrians, and supporting resource preservation by providing additional open space and enhanced scenic views. The Presidio Parkway Alternative would accommodate the goals and objectives of the plan. The Presidio Parkway Alternative would not permanently affect those trail corridors located in the vicinity of Doyle Drive including the Tennessee Hollow Trail, Park Boulevard Trail, or Presidio Promenade Trail. There would be improved views along portions of the

Tennessee Hollow and Presidio Parkway Trails as sections of Doyle Drive would be placed in tunnels.

The Presidio Parkway Alternative would maintain access by allowing pedestrians and bicyclists to cross over or under the Doyle Drive facility at numerous locations. It would also include new pedestrian crossings on Girard Road between the Palace of Fine Arts and Girard Road, as well as a crossing at the Richardson Avenue/Gorgas Avenue intersection (DKS Associates, 2004).

Presidio of San Francisco Vegetation Management Plan (VMP) and Environmental Assessment. While the Presidio Parkway Alternative would increase open space and provide an opportunity for habitat restoration on the areas located above the tunnels, it would be inconsistent with several objectives in the VMP including:

- Implementation of the alternative would not maintain the forest within the historic management zone and retain existing historic landscapes and plants, since it would require removal of approximately 5.6 hectares (13.7 acres) of tree cover, primarily near the Park Presidio Interchange for the Presidio Parkway Alternative with Diamond Interchange and Loop Ramp Option. The Hook Ramp Option would remove approximately 5.5 hectares (13.5 acres) of tree cover. Should the Circle Drive Option be used the totals would increase an additional 0.1 hectares (0.2 acres). Additionally the Merchant Road Slip Ramp Option would require an additional 0.5 hectares (1.1 acres) be removed.
- The Presidio Parkway Alternative would also be inconsistent with the VMP because of potential disturbance to groundwater at the Battery tunnels.

San Francisco General Plan. The Presidio Parkway Alternative would be partially consistent with the design guidelines presented in the Transportation Element. The alternative would improve safety of the roadway and also improve the scenic values of the Presidio by placing portions of the roadway in tunnels and lowering the height of the low-viaduct structure. The Presidio Parkway Alternative would not be consistent with a few *San Francisco General Plan* policies including:

- The additional southbound auxiliary lane, between the Park Presidio Interchange and the new Presidio access at Girard Road would create a seventh lane and be inconsistent with the guideline of a six lane design capacity.
- The Presidio Parkway Alternative would not be consistent with the *San Francisco General Plan's* policy to preserve landmarks and historic buildings. The Presidio Parkway Alternative would require the removal of the following historic buildings: Buildings 670, 201, 204 and 230. In addition, Building 1151 would be removed under the Circle Drive Option. Removal of historic buildings is inconsistent with the policy to preserve landmarks and historic buildings.

San Francisco Bay Plan. The Presidio Parkway Alternative would not affect the shoreline or undeveloped areas of the Presidio. According to the *Bay Plan*, these

areas are to be retained for park uses and therefore, this alternative would not be in conflict with this policy. The alternative would also accommodate a possible expansion of Crissy Marsh as called for in *Bay Plan* Map 4 Policy 27. The Presidio Parkway Alternative would improve access to the Presidio and indirectly improve access to those recreational opportunities available along the Bay.

Building Restoration Phase IIB and III, Palace of Fine Arts. The Presidio Parkway Alternative would be inconsistent with the proposed entry dropoff/turnarounds at the north and south ends of Palace Drive.

Both the Diamond and Circle Drive Options would reconfigure Palace Drive so that it directly intersects with Richardson Avenue and operates as a one-way street in the northbound direction. Palace Drive would no longer connect to Lyon Street; rather, Lyon Street would become one-way from Richardson Avenue and connect to Bay Street. The project sponsors would coordinate with the city and county of San Francisco Recreation and Park Department on the proposed design options for Palace Drive.

Preferred Alternative: Refined Presidio Parkway

The following permanent impacts associated with the Preferred Alternative are very similar to those of the Presidio Parkway Alternative with Diamond Interchange and Hook Ramp Options. The amount of land required would be approximately 2.6 hectares (6.4 acres). The majority of land to be converted to a transportation use is in areas currently designated as open space/natural. Other areas designated as mixed-use/visitor focus/office would also be converted. This reduction in overall land area to replace an existing roadway would not impact the larger Presidio-wide land use and development goals outlined in the PTMP but as discussed below, the removal of various buildings would be in conflict with the development plans of several PTMP defined planning areas and there may be limitations to the space available for the marsh restoration efforts.

Land Use

The following discussion focuses on land use and buildings within the Presidio and only those impacts of the Preferred Alternative that are different than the impacts of the Presidio Parkway Alternative previously discussed. **Exhibit 1-2** and the figures in **Appendix B** illustrate the location of buildings in the Presidio including the buildings discussed in this section.

Crissy Field. The Preferred Alternative will have the same impacts as the Presidio Parkway Alternative in the Crissy Field planning area.

Letterman. Under the Preferred Alternative, only Building 1158 (Mercantile Specialty Store) will be permanently removed from the Letterman planning area. The removal of 387 square meters (4,166 square feet) of building space will be in conflict with the PTMP which calls for an increase of 12,077 square meters (130,000 square feet) in building space. Currently, Building 1158 houses the Presidio Dance Theatre. The removal of this non-historic building will not

severely impact the overall land use of the Letterman planning area as the area will still function in its role as a compact mixed-use office and residential area.

There will be modifications to the circulation patterns of the area as Girard Road will be extended to form a new interchange with the Doyle Drive off-ramp and Gorgas Avenue. The intersection of the off-ramp to Girard Road was moved 20 meters (66 feet) to the south thereby moving the connection along Gorgas Avenue away from the warehouses and preserving the streetscape in front of the buildings. In addition, the intersection for the northbound on-ramp was moved 20 meters (66 feet) south along with reducing the northbound off-ramp from two lanes to one lane. These adjustments preserved much of the landscaping in the area west of the Palace of Fine Arts. The Preferred Alternative will maintain Palace Drive as a two-way road, and incorporate the modifications proposed by the San Francisco Department of Recreation and Parks at both the north and south ends where Palace Drive connects to Lyon Street. The alternative will also maintain Lyon Street as a two-way street with connection to Bay Street. Pedestrian access will be provided under Doyle Drive from the Gorgas warehouses to the Palace of Fine Arts and under Girard Road from the Palace of Fine Arts to the Mason Street warehouses.

The Preferred Alternative eliminates the previously proposed underground parking associated with the Presidio Parkway Alternative and redesigns the parking west of Palace Drive and south of Mason Street warehouses as surface parking instead. Surface parking will be provided behind the Gorgas warehouses, on-street parking will be provided along Gorgas Avenue and perpendicular parking will be provided along both sides of a two-way Palace Drive.

Main Post. Under the Preferred Alternative approximately 3,500 square meters (37,625 square feet) of building space will be permanently removed. The top portion of Building 201 will be returned to the site of the original building following completion of the roadway construction activities. This will return approximately 532 square meters (5,727 square feet) to the Main Post planning area. In addition, the profile of Halleck Street will have to be raised by an additional 0.8 meters (2.6 feet) at the north face of Building 228, with the crest of Halleck Street at an elevation of ten meters (32.8 feet).

Fort Scott. There will be no impacts to the Fort Scott planning area associated with the Preferred Alternative.

Area A. There will be no impact to the land uses of Area A associated with the implementation of the Preferred Alternative.

San Francisco Neighborhoods. There will be no impact to the land uses of the surrounding San Francisco neighborhoods associated with the implementation of the Preferred Alternative.

Plans and Policies

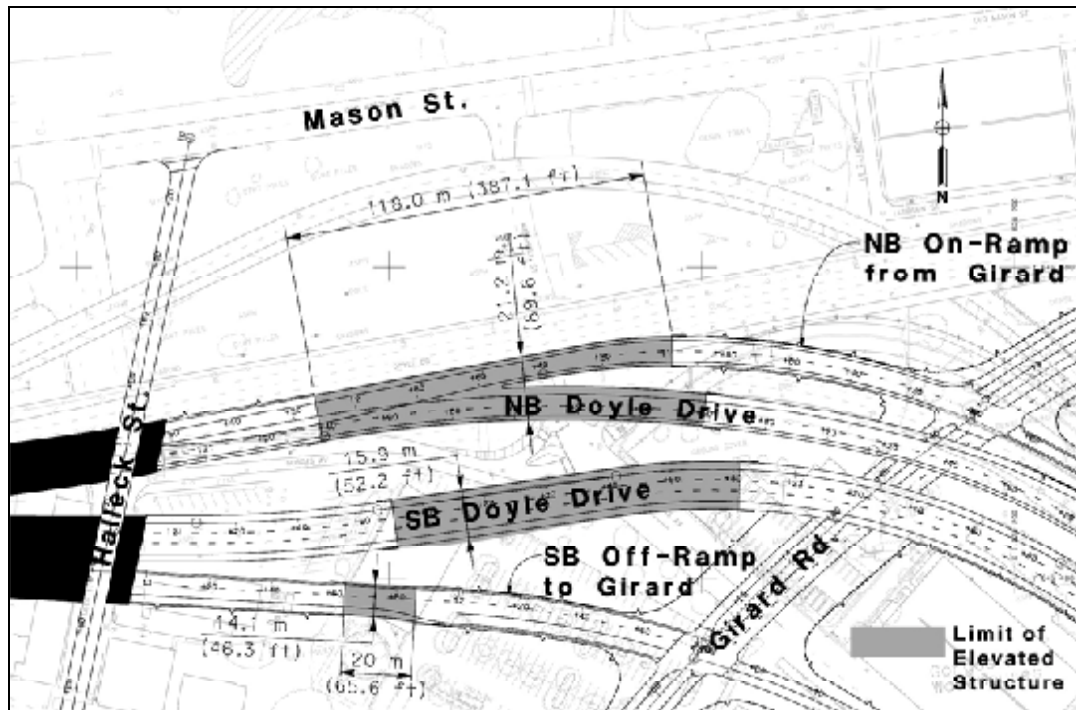
2002 Presidio Trust Management Plan. The Preferred Alternative will generally be consistent with objectives of the PTMP although it will be inconsistent with the following PTMP land use and planning policies:

- Implementation of the Preferred Alternative will result in short-term and long-term impacts on park resources.
- Balanced Use of Building Space – The Preferred Alternative will not be consistent with this policy since it will require the permanent removal of Buildings 605 and 606 in the Post Exchange/Commissary area, Building 1158 in the Gorgas warehouses area, Buildings 201 (lower portion only), 204, 205, 230, and 231 in the Main Post – North Halleck area, and Building 670 in the Cavalry Stables area.
- The Preferred Alternative will not be consistent with the PTMP objective to preserve and enhance the historical resources of the Presidio.
- The Preferred Alternative will provide enough space to accommodate a connection for the Tennessee Hollow drainage to Crissy Marsh although there may be some limits to the functionality of the area as a riparian and wildlife corridor due to the width of the structures and limited length and height of the southbound off-ramp. Under the Preferred Alternative, the width of the southbound Girard Road off-ramp structure is 10.8 meters (35.4 feet) with an elevation of 3.4 meters (11.2 feet) to meet the 100-year tsunami design criteria. The length of this off-ramp structure is 20 meters (65.6 feet). The width of the southbound Doyle Drive mainline structure as it crosses over the Tennessee Hollow area is 15.9 meters (52.2 feet) with a length of 120 meters (393.7 feet). The maximum elevation of the bottom of structure is 5.6 meters (18.4 feet) at the east end of structure. The width of the combined northbound Doyle Drive/northbound Girard Road on-ramp structure varies between 15.8 meters (51.8 feet) at the east end of structure to a width of approximately 21.2 meters (69.6 feet) where the ramp and mainline diverge. Past the diverge the northbound Girard Road on-ramp is 9.9 meters (32.5 feet) wide and the mainline is 11.4 meters (37.4 feet) wide. Based on the 100-year tsunami elevation, the minimum elevation of the bottom of the mainline structure (3.4 meters (11.2 feet)) occurs at the beginning of the elevated structure just east of the tunnel portal. The maximum elevation along the mainline is 5.5 meters (18 feet), which is found at the east end of structure. The length of structure between these two points is 120 meters (393.7 feet). The minimum height of the bottom of structure on the northbound on-ramp is 3.4 meters (11.2 feet) at a point approximately 60 meters (196.8 feet) east of the diverge point. The shaded area on **Exhibit 3-7** shows the area available for marsh expansion under the Presidio Parkway Alternative.

As described above, the dimensions of the Preferred Alternative will allow for a riparian corridor connection between Tennessee Hollow and Crissy Marsh although the limited length of space (20 meters (65.6 feet)) under the

southbound Girard Road off-ramp does not meet the desired 61 meter (200 foot) width for a riparian corridor, nor will it likely be able to accommodate a pedestrian trail adjacent to the corridor under the structure. The Preferred Alternative will result in an increased separation between the causeway and the off-ramp to Girard Avenue. This may allow more light to reach vegetation in the restored wetland being planned in this area. The new structures will potentially comprise an impediment to wildlife using the restored Tennessee Hollow/Crissy Marsh area for movement to and from the existing Crissy Marsh. However, assuming that the corridor under the viaducts is designed with natural features such as logs and rocks, it is concluded that the Preferred Alternative will not constrain the use of the Tennessee Hollow area as a wildlife corridor for terrestrial wildlife, although some birds may not be able to pass through.

Exhibit 3-7
Preferred Alternative
Area Available for Marsh Restoration



1994 Presidio General Management Plan Amendment. The Preferred Alternative will be consistent with the Doyle Drive specific policies set forth in the GMPA and the GMPA Planning Area Concepts for Area A.

Doyle Drive Task Force Report. The Preferred Alternative will be consistent with the report recommendations since it will improve the existing Doyle Drive with many features included in the proposed parkway concept.

Presidio Trails and Bikeways Master Plan & Environmental Assessment. The Preferred Alternative is consistent with this plan.

Presidio of San Francisco Vegetation Management Plan (VMP) and Environmental Assessment. The Preferred Alternative will increase open space and provide an opportunity for habitat restoration on the areas located above the tunnels. It will be inconsistent with several objectives in the VMP including:

- Implementation of the alternative will not maintain the forest within the historic management zone and retain existing historic landscapes and plants, since it will require removal of approximately 4.4 hectares (10.9 acres) of tree cover, primarily near the Park Presidio Interchange.
- The Preferred Alternative will also be inconsistent with the VMP because of potential disturbance to groundwater at the Battery tunnels.

San Francisco General Plan. The Preferred Alternative will be partially consistent with the design guidelines presented in the Transportation Element. The alternative will improve safety of the roadway and also improve the scenic values of the Presidio by placing portions of the roadway in tunnels and lowering the height of the low-viaduct structure. The alternative will not be consistent with the following *San Francisco General Plan* policies:

- The additional southbound auxiliary lane, between the Park Presidio Interchange and the new Presidio access at Girard Road will create a seventh lane and be inconsistent with the guideline of a six lane design capacity.
- The Preferred Alternative will not be consistent with the *San Francisco General Plan's* policy to preserve landmarks and historic buildings. The Preferred Alternative will require the removal of the following historic buildings: Buildings 670, 230, 204, and 201 (upper portion of the building would be returned). Removal of historic buildings is inconsistent with the policy to preserve landmarks and historic buildings.

San Francisco Bay Plan. The Preferred Alternative will be consistent with the policies of the *Bay Plan*.

Building Restoration Phase IIB and III, Palace of Fine Arts. The Preferred Alternative will be consistent with the proposed entry drop off/turnarounds at the north and south ends of Palace Drive. Palace Drive will remain as a two-way road while Lyon Street will also stay a two-way street with a connection to Bay Street.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. The project team will continue to work with the Trust and NPS during final design of this project in order to find the most feasible solution to accommodate the proposed marsh expansion efforts. See **Appendix K** for a summary of the proposed actions to be undertaken for developing a functioning wildlife corridor through the Tennessee Hollow area. Coordination with the Trust regarding location and duration of work in the Presidio will be carried out whenever feasible. Building removal associated with the Preferred Alternative which is in addition to the guidelines established for future demolition in the PTMP, will constitute an amendment to the PTMP. The PTMP will be adjusted accordingly upon implementation of the alternative. See the discussion under Relocation (Section 3.2.6) for more information regarding building removal.

3.2.2 Parks and Recreation

This section summarizes the type and location of park and recreational facilities within the study area. In addition, potential impacts and mitigation are presented.

Regulatory Setting

The *National Environmental Policy Act* (NEPA) and the *California Environmental Quality Act* (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 users' enjoyment of the facility (increased noise, decreased safety, etc.). In addition to these analyses, the Federal Highway Administration (FHWA) also requires a separate impacts analysis of parks and recreational facilities if certain conditions are met.

Specifically, *Section 4(f)* of the *United States Department of Transportation (USDOT) Act of 1966* provides protection to certain publicly used lands and historic sites. Under *Section 4(f)*, FHWA shall not approve any program or project which requires the use of any publicly owned public park, recreation area, or wildlife or waterfowl refuge, or a site of any land from an historic site 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 which was purchased with Land and Water Conservation Funds be replaced in-kind. There are no *Section 6(f)* lands in the Doyle Drive study area. Chapter 7 presents a *Section 4(f)* analysis as it relates to some of these facilities.

Affected Environment

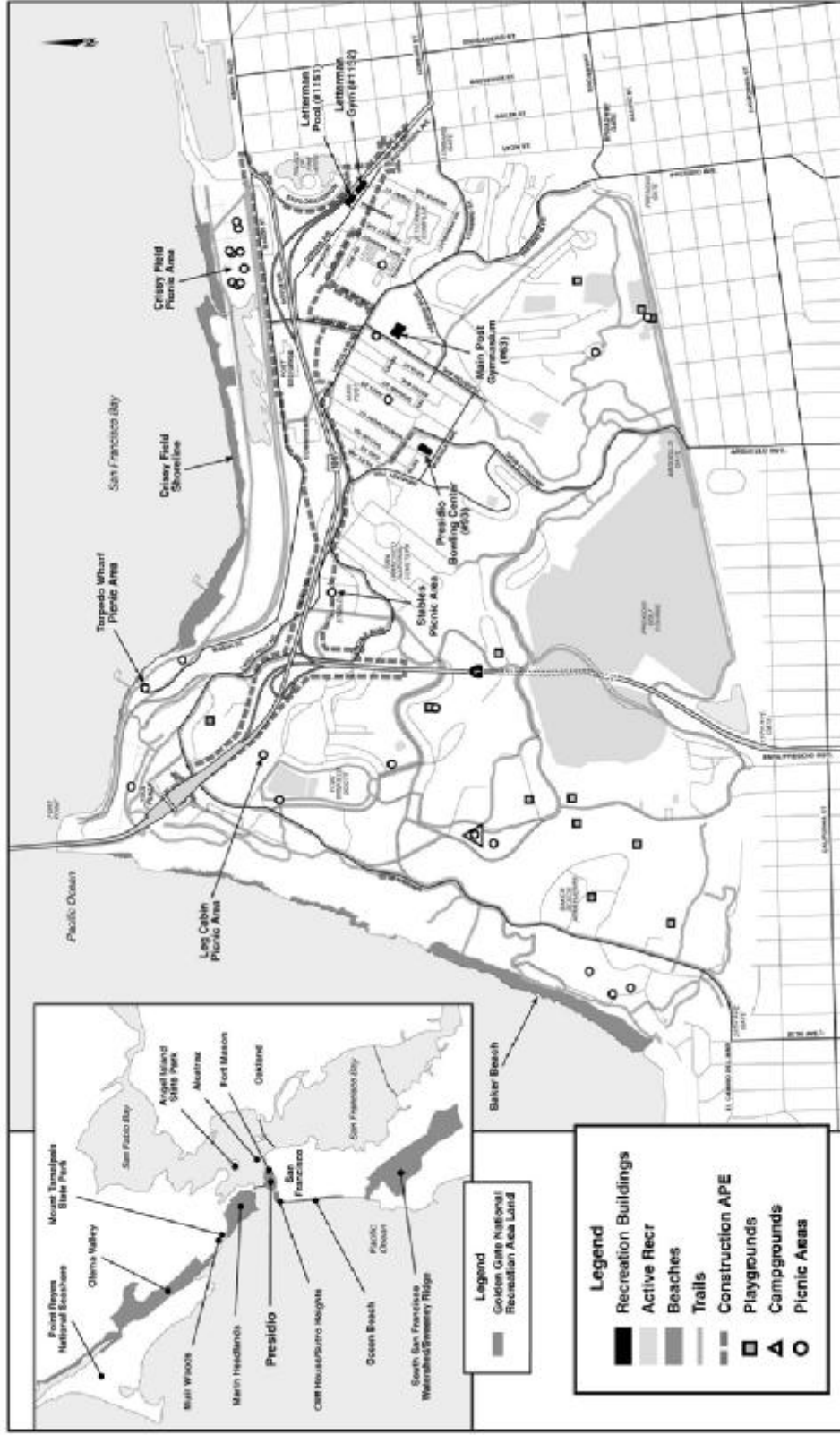
Within and adjacent to the Presidio, recreational areas are managed by different agencies. The National Park Service (NPS) manages Area A of the Presidio (the beaches on the coast and bay), in addition to other surrounding open space areas. The city and county of San Francisco manage Julius Kahn playground, which is located within the Presidio boundaries. The city and county also manage a portion of Mountain Lake Park, the Marina Green and Palace of Fine Arts, all of which are located outside of the Presidio boundaries. The Presidio Trust (Trust) manages all other recreational facilities within the Presidio.

A wide range of outdoor recreation facilities are currently provided in the Presidio, including court and field sport facilities (such as tennis courts), a golf course, playgrounds, picnic areas, trails, a group campground, and beaches. In addition, there are various sport complexes ranging from baseball fields, basketball courts, volleyball courts, and multi-use fields spread throughout the Presidio (see **Exhibit 3-8** on the following page).

Specific park and recreational facilities which may be located within the general construction area of the Doyle Drive Project include:

- **Letterman Pool** (Building 1151) - Built in 1945 (World War II Period), this one-story structure houses an indoor pool. It is currently administered by the YMCA and it is available to the general membership of the YMCA.
- **Letterman Gym** (Building 1152) - This building continues to be used as a gymnasium administered by the YMCA. The gym is reserved for group activities (e.g., basketball and other group sports) by the YMCA, but it is not open to individual YMCA members or members of the public.
- **Bicycle and Pedestrian Facilities** - Currently there are nearly 60 kilometers (37 miles) of trails available for recreational use within the Presidio, including 17.7 kilometers (11 miles) of bicycle trails, 9.6 kilometers (six miles) of multi-use trails, and 32 kilometers (20 miles) of walking/hiking trails (Trust, 2002). In addition, there are approximately 16 kilometers (ten miles) of unofficial social trails created by park users. Bicyclists are permitted on designated multi-use trails and paved roads. Several routes of the San Francisco Bike Route System traverse the Presidio; these include routes 2, 4, 55, 61, 65, and 95. Two of the most heavily used trails are the Crissy Field Promenade, which follows the alignment of the San Francisco Bay Trail along Crissy Field to Fort Point, and the California Coastal Trail, which links the Presidio with the California coastline (Trust, 2002). Other designated trail corridors which cross the Doyle Drive corridor include the Presidio Promenade, Park Boulevard Trail and the Tennessee Hollow Trail. In addition, several roads with bicycle and pedestrian paths are located in the general project study area, including Lincoln Boulevard, McDowell Avenue/Crissy Field Avenue, Bank Street and Halleck Street.

**Exhibit 3-8
Recreational Features in the Presidio**



- **The Palace of Fine Arts and Exploritorium** - The Palace of Fine Arts is a reconstruction of an exhibit space and outdoor recreation area that was built from 1914 to 1915 as part of the Panama-Pacific International Exhibition and today includes a rotunda, colonnades and lagoon. The Exploritorium, a museum specializing in science, art and human perception is located in the large exhibit hall that curves along the backside of the rotunda and colonnades. These unique features are not located within the boundaries of the Presidio but just to the east of the Park. The Palace of Fine Arts is surrounded on the north, west and southwest by Doyle Drive (the approaches to the Golden Gate Bridge): one from Marina Boulevard and one carrying US 101 from Richardson Avenue. The Palace of Fine Arts and Exploritorium are regional and tourist destinations.
- **East Parking Lot and Gift Shop** – The east parking lot is a key support component for the recreational activities associated with the Golden Gate Bridge. This metered parking area, located immediately east of the Golden Gate Bridge Toll Plaza, provides parking and access to a range of recreational and visitor services, including a café, gift center, gardens, and an array of scenic vistas. The parking area includes 81 metered spaces, three of which are designated for visitors with disabilities that have disabled placards. There are five spaces for tour buses. On weekends and holidays only, additional parking is available in a nearby satellite lot on the southwest side of the Toll Plaza.

Temporary Impacts

Temporary impacts to park and recreational resources and their users are primarily the result of short-term road closures and intermittent increases in noise levels due to construction activities associated with the build alternatives. Although there would be an increase in noise levels at Crissy Field and along the bicycle and pedestrian paths adjacent to the construction corridor, the use of these areas will not be impaired (see Section 3.3.5, Noise and Vibration, later in this chapter).

The following identifies specific temporary impacts by alternative:

Alternative 1: No-Build

The No-Build Alternative would not temporarily affect any recreational facilities within the Presidio.

Alternative 2: Replace and Widen

Temporary impacts resulting from Alternative 2 are generally the same for all build alternatives (see below) with the exception of noise impacts at the Crissy Field Center.

With the possible exception of pile driving construction, noise levels would be in the range of 85 to 90 dBA within 15 meters (50 feet) of the corridor. The Replace and Widen, With Detour Option would likely have the greatest

construction noise impacts on the Crissy Field Center due to the actual construction of the detour, which would be placed in close proximity to the Center. To minimize construction noise impacts during the construction phases of this project, management of the Crissy Field Center and the construction contractor can aid in reducing or eliminating potential noise impacts by careful coordination between noisy construction activities and noise sensitive Center activities. See the Noise and Vibration section for more detail of noise impacts.

Alternative 5: Presidio Parkway

Temporary impacts resulting from Alternative 5 are the same for all build alternatives. Impacts are discussed below.

Preferred Alternative: Refined Presidio Parkway

Temporary impacts resulting from the Preferred Alternative are the same for all build alternatives. Impacts are discussed below.

Alternative 2: Replace and Widen, Alternative 5: Presidio Parkway, and Preferred Alternative

With the exception noted above, temporary impacts for all build alternatives would be similar. Construction activities will require the periodic closure of various roadways including portions of McDowell Avenue, Crissy Field Avenue, Lincoln Boulevard, Halleck Street, and Marshall Street. In addition, for the Presidio Parkway and Preferred Alternatives, Halleck Street would be closed for most of the construction period. Detours will be available and signage will be provided to direct bicyclists and pedestrians to the alternate routes. Bicycle and pedestrian access across the Doyle Drive corridor will be maintained throughout the construction period via Marshall Street, Crook Street, McDowell Avenue/Crissy Field Avenue, at the Lincoln Boulevard/Veterans Boulevard Interchange, and at the Lincoln Boulevard/Golden Gate Bridge Toll Plaza. Bicycle and pedestrian access to the Palace of Fine Arts from Palace Drive will be unavailable during the construction of either the Diamond or Circle Drive Options both of which require the reconfiguration of the street. However, bicycle and pedestrian access from Palace Drive will be maintained with the Preferred Alternative. In addition, with the Preferred Alternative, Palace Drive will remain a two-way road and incorporate the modifications proposed by the San Francisco Department of Recreation and Parks at both the north and south ends where Palace Drive connects to Lyon Street. Access to the Palace of Fine Arts will still be available under all the build alternatives from Bay and Baker Streets.

Permanent Impacts

Permanent impacts resulting from the implementation of the proposed project are summarized below. The permanent impacted parkland acreage presented below is based on the increase in the footprint of the new facility compared to that of the existing facility footprint.

Alternative 1: No-Build

The No-Build Alternative would not have any affect on recreational facilities within the Presidio.

Alternative 2: Replace and Widen

The Replace and Widen Alternative - No-Detour Option would require an additional 0.9 hectares (2.2 acres) of parkland while the Detour Option would require an additional 0.6 hectares (1.5 acres) of parkland.

Alternative 5: Presidio Parkway

The Presidio Parkway Alternative – Diamond Option with Loop Ramp would require an additional 4.6 hectares (11.4 acres) of parkland, while the Circle Drive Option with Loop Ramp would require 4.5 hectares (11.1 acres). The Presidio Parkway Alternative – Diamond Option with Hook Ramp would require an additional 4.1 hectares (10.1 acres) of parkland, while the Circle Drive Option with Hook Ramp would require 3.9 hectares (9.6 acres). The implementation of the Merchant Road Slip Ramp would require 0.5 hectares (1.2 acres) in addition to the area required for either option. The Circle Drive Option would also require the removal of the YMCA swimming pool (Building 1151). A total of 2.4 hectares (5.9 acres) of land area located over the tunnel segments would be made available as parkland.

The reconfiguration of Palace Drive associated with either the Diamond or Circle Drive Options would alter the access to Palace Drive which would connect directly with Richardson Avenue and operate as a one-way northbound street. It would no longer connect with Lyon Street on the southern end. Bicycle and pedestrian access would not be limited along the reconfigured Palace Drive.

Preferred Alternative: Refined Presidio Parkway

Permanent impacts associated with the Preferred Alternative will be the removal of 2.6 hectares (6.4 acres) of parkland although a total of 2.4 hectares (5.9 acres) of land area located over the tunnel segments will be made available as parkland.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. Coordination with the Trust and the NPS regarding location and duration of construction activities in affected park and recreation facilities will be carried out whenever feasible. Temporary pedestrian and bicycle access will be provided on already designated bicycle/pedestrian paths and routes on either side of the project area. Access across the Doyle Drive corridor during construction would be maintained at various locations including Lincoln Boulevard, McDowell Avenue, and Lyon Street. The project proponent is committed to providing temporary access across the roadway whenever possible.

Upon project completion, pedestrian and/or bicycle access across Doyle Drive will be provided at numerous locations in accordance with the *Presidio Trails and Bikeways Master Plan* including: Lincoln Boulevard, McDowell Avenue, adjacent Tennessee Hollow, Halleck Street, Girard Road, and Richardson Avenue. In addition, enhanced opportunities for crossing Doyle Drive will be provided in the areas over both the tunnels.

The project proponent will keep the public informed of recreation impacts during the construction process. Specific mitigation measures to minimize possible construction noise related impacts are outlined later in this chapter as part of the Noise and Vibration discussion (Section 3.3.5).

3.2.3 Growth

This growth analysis examines the relationship between the Doyle Drive Project and growth within the project study area. The initial growth analysis presented in the DEIS/R was prepared under the agreed upon guidance in 2004. Based on a review of the guidance available in 2007 when this FEIS/R was prepared, the project has determined that the need for indirect growth induced impact analysis would have been screened out early in the project development process since the nature of the project and its location within the Presidio have led to the determination that the project would not result in any direct or indirect growth related impacts. The proposed project would not add capacity to Doyle Drive and the proposed access points are consistent with the PTMP. Therefore, the build alternatives are not likely to affect the location of development in the Doyle Drive Project area. Timing of growth could be influenced by the construction schedule, but still falls within the PTMP planning horizon.

Regulatory Setting

The *California Environmental Quality Act* (CEQA) requires that the potential growth resulting from a new project be identified and analyzed within the context of the community.

Affected Environment

The Land Use and Community Impacts sections present summaries of the general social, economic, and land use conditions within the project study area.

The discussion of growth inducement for each alternative is aimed at addressing the following questions:

- 1) What is the reasonably foreseeable growth and land use change with and without the project?
- 2) To what extent will the project influence the overall amount, type, location, or timing of that growth?
- 3) Will project-related growth put pressure on or cause impacts to environmental resources of concern?

Temporary Impacts

There will be no temporary growth inducement related to the construction of any of the proposed alternatives.

Permanent Impacts

Implementation of any of the alternatives (and their options) will not result in the inducement of direct or indirect unplanned growth in the study area. The project will not be placing a new facility in an undeveloped area nor will expand or increase the capacity of the roadway. The replacement of Doyle Drive and providing direct access to the park is part of the future development plans of the Presidio. In addition, all future growth, both residential and commercial, within the Presidio is guided by the *Presidio Trust Management Plan (PTMP)*. The Presidio Trust is currently moving forward with implementing various rehabilitation, restoration and removal efforts within the Park in an effort to meet their development goals. The desired outcome is to have new construction of replacement housing to achieve their planning goals completed by 2013.

In general, future growth is expected throughout the region, particularly within the Presidio, where the population is expected to increase by approximately 52 percent by the year 2030 based on the Association of Bay Area Governments' *Projections 2003: Forecasts for the San Francisco Bay Area to the Year 2030* (June 2003). This would be an increase of 3,400 persons. As stated above, all the future commercial and residential growth in the Presidio is strictly managed by the guidelines set forth in the PTMP.

Alternative 1: No-Build Alternative

Growth within the Presidio is governed by the Presidio Trust and guidelines of the PTMP although implementation of the No-Build Alternative would potentially affect or hinder the future development efforts. Due to further deterioration of the high-viaduct and need for vehicle weight limits, the potential traffic restrictions on Doyle Drive would limit access to the area and the Presidio. Should the traffic restrictions severely limit vehicular access through the area the desirability of commercial and residential locations in the Presidio may be negatively impacted and result in lower numbers of commercial and/or residential tenants. The potential for reduced growth associated with the No-Build Alternative would not put pressure or cause impacts to any environmental resources of concern.

Alternative 2: Replace and Widen

The new structure under the Replace and Widen Alternative would maintain existing access to the Presidio and it would not increase traffic capacity although there is the potential that this alternative may limit planned growth. The PTMP assumes that the Doyle Drive replacement would provide direct access to the Presidio and the Replace and Widen Alternative does not provide this. The limited access may negatively impact the desirability of commercial and residential locations in the Presidio and result in lower numbers of commercial

and/or residential tenants. This alternative would not result in unchecked growth, directly or indirectly, within the Presidio or surrounding areas. The potential for reduced growth associated with the Replace and Widen Alternative would not put pressure or cause impacts to any environmental resources of concern.

Alternative 5: Presidio Parkway

Implementation of the Presidio Parkway Alternative would be in accordance with the PTMP and would provide improved access to the Presidio which would facilitate the development plans of the Presidio Trust. There is the potential that construction activities associated with Doyle Drive would interfere with the timing of some of the commercial development plans for facilities in the immediate vicinity of the roadway should those activities occur during the same time frame. No residential development plans would be affected by the construction activities. This alternative would not result in unchecked growth, directly or indirectly, within the Presidio or surrounding areas. Additionally, because growth would be managed by the Presidio Trust and the PTMP, the Presidio Parkway Alternative would not put pressure or cause impacts to any environmental resources of concern.

Preferred Alternative: Refined Presidio Parkway

Implementation of the Preferred Alternative will have similar results as those stated for the Presidio Parkway Alternative. This alternative will not result in unchecked growth, directly or indirectly, within the Presidio or surrounding areas nor will it put pressure on or cause impacts to any environmental resources of concern.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. Avoidance, minimization and/or mitigation measures will not be required.

3.2.4 Community Impacts

A *Community Impact Assessment* (CIA) was performed for this project. A CIA reviews various characteristics and resources as they relate to a community, such as population growth, safety, emergency vehicle access, and access to community facilities. This section summarizes the results of this analysis.

Regulatory Setting

Federal and state laws relevant to this analysis are: the *National Environmental Policy Act* (NEPA), the *California Environmental Quality Act* (CEQA), the *Architectural Barriers Act* of 1968 (ABA), and the *Americans with Disabilities Act* of 1990 (ADA). The ABA requires access to facilities designed, built, altered, or leased with Federal funds. It marks one of the first efforts to ensure access to the built environment. The Access Board develops and maintains accessibility

guidelines under the ABA. These guidelines serve as the basis for the standards used to enforce the law, the *Uniform Federal Accessibility Standards* (UFAS). The ADA outlines the Federal guidelines and accessibility requirements for disabled access to parking facilities, pathways and buildings. All new facilities associated with the Doyle Drive Project will be in full compliance with the ADA.

Affected Environment

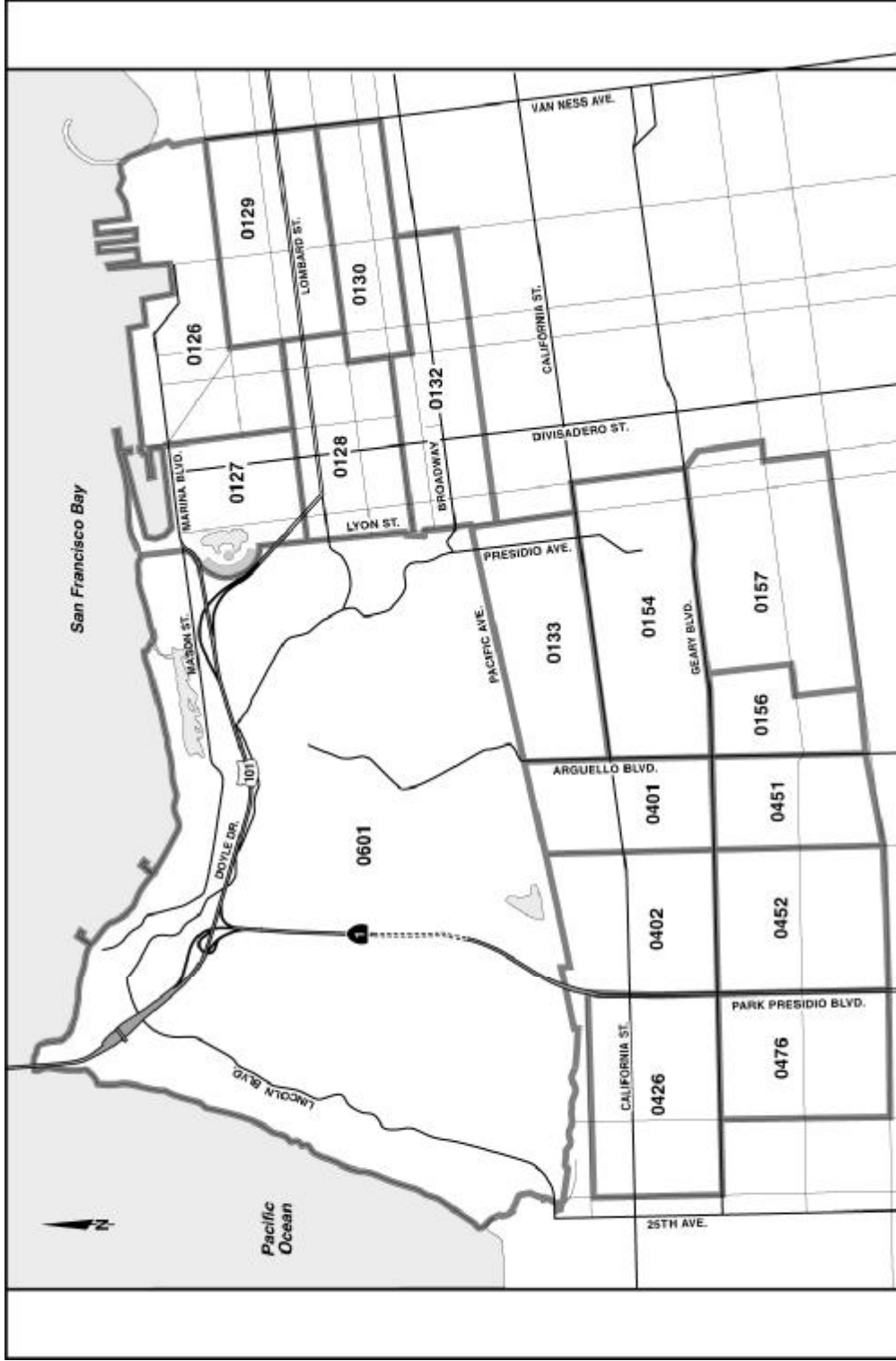
The following is a summary of community resources, including: community character/cohesion, community facilities, utilities, and emergency services.

Community Character/Cohesion

The project study area for the analysis of community resources is comprised of the Presidio (census tract 0601) and 16 surrounding tracts where project-related effects might occur (see **Exhibit 3-9**). Based on year 2000 U.S. Census data, the total population for the census tract study area was 82,870, which was 11 percent of the total population of the city and county of San Francisco. Doyle Drive traverses the northern portion of tract 0601, which is the largest of the 17 tracts with a land area of 603 hectares (1,490 acres).

According to data provided by the Presidio Trust, as of November 2007, there were a total of 1,100 apartments and single-family homes in the Presidio plus 109 dorms or former bachelor officers' quarters. Approximately 1,050 of the single-family homes and apartments managed by the Trust are currently occupied, while the other units are either vacant or not available for rent because they are under or are waiting for rehabilitation. As of November 2007, approximately 2,600 people lived in the 1,050 units, an average of approximately 2.45 persons per household. Additionally, approximately 70 people lived in group quarters in the 54 units at Building 1028 (former nurses' dorms) that are managed by the Trust. The November 2007 vacancy rate for available housing, calculated using the number of units that are available for lease, is approximately three percent.

**Exhibit 3-9
Census Tract Study Area**



In 2000, the total number of employed residents for all tracts within the study area was 54,538 (ABAG, June 2003). By 2030, the number of employed residents is projected to increase by approximately 14 percent to 62,122. In 2000, the total number of jobs within the census tract study area was approximately 35,870 (ABAG, June 2003). The largest percentage of jobs, approximately 46 percent, was in the service sector. Retail trade comprised 24 percent of the jobs, wholesale just over two percent, and manufacturing and agriculture each only accounted for less than one percent of total jobs within the census tract study area. According to 2030 projections, the total number of jobs within the census tract study area is projected to increase by approximately 30 percent to 46,635 jobs by the year 2030. Currently, there are an estimated 2,020 employees in the Presidio, with the majority of jobs in governmental and non-profit sectors. According to the PTMP, the projected employment in the Presidio is expected to be 6,890 by 2020.

In 2000, the total number of employed residents in the Bay Area was about 3,605,675, and total employed residents in San Francisco were 444,851 (ABAG, June 2003). In May 2004, the average civilian unemployment rate for the Bay Area was 4.7 percent, lower than the 6.2 percent level statewide average (Bureau of Labor Statistics, www.bls.gov).

Community Facilities

There are a number of schools located within the Presidio. There are three preschools: the Serra Preschool, the Lone Mountain Children's Center, and Presidio Child Development Center (preschool affiliated with the San Francisco Unified School District), according to correspondence with John Pelka, The Presidio Trust, dated August 30, 2004. The Bay School of San Francisco (approximately 100 high school students in 2004 to 2005, and estimated to increase to 375 to 395 students) is located in Building 35.

There are approximately 20 organizations that offer educational programs at the Presidio. Most are located near the Letterman Complex and the Main Post area. In particular, there are three organizations that are located in the vicinity of the proposed alternatives for Doyle Drive. They are:

- Crissy Field Center, 603 Mason Street – A program of the NPS and the Golden Gate National Park Conservancy, this community environmental center conducts educational workshops and other programs for the public, including outreach to low-income and minority groups. The Center also provides a small café and book store, to supplement and facilitate educational activities;
- Archaeology Lab, 230 Gorgas Avenue – The Archaeology Lab provides programs in partnership with the Crissy Field Center and targets many of the same groups; and
- Swords to Plowshares Veteran's Academy, 1029 and 1030 Girard Road – This non-profit organization aids Bay Area veterans in the rehabilitation and

restructuring of their lives, and offers training in areas such as computer use and cooking.

Two churches are located in the Presidio. The non-denominational Chapel of Our Lady is located in the Main Post near the Officers' Club. It is used for weddings, memorial services, religious services and small speaking engagements or performances. The Main Post Chapel (Presidio Interfaith Chapel) is located on Fisher Loop just east of the San Francisco National Cemetery. The chapel is primarily used for wedding ceremonies. Another prominent community facility within the study area is the Presidio Pet Cemetery. Located at the corner of McDowell Avenue and Cowles Avenue, this cemetery provides memorial for military pets. The oldest markets in the cemetery date to the early 1950s. The cemetery is currently maintained by Swords to Plowshares.

Utilities

The utility system is comprised of the water, sewer, stormwater, power, natural gas, and telecommunications systems. This section describes these facilities within the project area.

Water System

Lobos Creek is the primary source for drinking water in the Presidio. The water is treated at the Presidio Water Treatment Plant. The water distribution system also supplies irrigation systems, internal building sprinkler systems, and fire hydrants. Near the project site, water pipes run parallel to and across Doyle Drive. In cases when the water supply from Lobos Creek is not adequate, water may also be obtained from the San Francisco Public Utilities Commission water system, which connects to the Presidio's water system.

Construction of a recycled water treatment system in Building 1063 is planned for 2008 or later. The system would convert wastewater originating from the Presidio into high-quality recycled water suitable for landscape irrigation and other non-potable uses. The system would both reduce the potable water demand, and reduce the amount of sanitary sewer flows to the city and county of San Francisco's combined sewer system. Phase I of the system would produce 200,000 gallons per day of recycled water that would be used for irrigation at the Letterman Digital Arts Center and Crissy Field. Phase II would expand capacity to a maximum of 500,000 gallons per day, making recycled water available to other areas of the Presidio including the Main Post, National Cemetery, and Fort Scott. Building 1063, the former Medical Supply warehouse, is the designated site for the treatment plant (*Presidio Trust Recycling Project Environmental Assessment*, March 2002).

Sewer System

All wastewater generated in the Presidio is discharged to the city of San Francisco sewer system. Wastewater from the east side of the Presidio is transported to the Southeast Water Pollution Control Plant and wastewater from the west side is transported to the Oceanside Water Pollution Control Plant.

Two wastewater pump stations are located in the construction corridor of the Presidio. The larger wastewater pump station, which includes two 150-millimeter (six-inch) pumps, is located near Building 211 and takes wastewater from the Crissy Field area. The smaller wastewater pump station is located between Buildings 1160 and 1152 and takes wastewater from along Richardson Avenue. The sanitary sewer system consists of 203-, 254-, 305-, 406- (8-, 10-, 12-16-inch), and 457-millimeter (18-inch) diameter pipes that run parallel to and across Doyle Drive.

Stormwater System

The stormwater system, which is separate from the sanitary sewer system, collects surface runoff and discharges water directly into San Francisco Bay or the Pacific Ocean. The east side of the Presidio also discharges stormwater into the Crissy Field wetland. The stormwater system consists of various sized pipes, ranging from 203-millimeter (eight-inches) to 1,219-millimeter (48-inches) in diameter. All pipelines in the Doyle Drive corridor flow by gravity to the north and cross the roadway.

Power System

Electric power is supplied by Pacific Gas and Electric Company (PG&E), through its Greenwich and Main Post substations. Within the Presidio, distribution is accomplished by the Trust's high voltage department. The electric distribution system consists of the two major substations, twelve emergency back-up generators, and approximately 68 kilometers (42 miles) of above and below ground electrical lines. The power lines vary in voltage up to 12,000 volts. Many are located parallel to and across Doyle Drive. PG&E operates a 12,000-volt line that runs along Doyle Drive and provides power to the Golden Gate Bridge, Highway and Transportation District (GGBHTD).

Natural Gas System

Natural gas is provided to the Presidio by PG&E via a system of 102-millimeter (four-inch) and 152-millimeter (six-inch) diameter pipes located parallel to and across Doyle Drive. In July 2002, the National Park Service transferred ownership to the Trust of a vehicle fueling station that provides compressed natural gas. The vehicle fueling station is located at the west end of Building 204.

Telecommunications System

All telecommunications lines (including both copper and fiber) in the proposed footprints for the Doyle Drive Project are located entirely underground and cross Doyle Drive in 14 locations. The number of cable ducts at each location varies from 2 to 9, each generally 102 millimeters (four inches) in diameter.

Emergency Services

The project study area is served by police, fire and emergency providers. The following is a summary of these services.

Police

Law enforcement services in Area B of the Presidio are provided by the U.S. Park Police (USPP). Services in Area A are provided by both the USPP and NPS law enforcement rangers. The USPP also has a mutual aid agreement with the San Francisco Police Department (SFPD) whereby the SFPD would provide assistance on request. In the remainder of the GGNRA, law enforcement services are provided by NPS rangers or other local law enforcement agencies, depending on the jurisdiction. The California Highway Patrol (CHP) has jurisdiction over Doyle Drive and Veterans Boulevard. The USPP services include vehicle, motorcycle, horse-mounted, bicycle and foot patrols. The USPP has a police station located in Building 1217 on Ralston Road in the Fort Scott area near the Golden Gate Bridge, as well as a horse stable located at Building 661. The USPP also have a Communications Center located in part of Building 35, which is also relevant to their response capability.

Other law enforcement services in the Presidio are provided by the SFPD, which serves the parking lot/overlook on the south side of the Golden Gate Bridge Toll Plaza, and the Marina and Cow Hollow neighborhoods. There are two SFPD District Stations within the study area, District Stations E and G. District Station E covers the Marina district, Lombard Street corridor and Cow Hollow neighborhood. It is called the Northern Police Station and is located at 1125 Fillmore Street. District Station G covers the Presidio, Presidio Heights, Richmond, Inner Richmond, and part of Western Addition. It is called Richmond Police Station and is located at 461 6th Avenue.

Fire and Emergency Services

The Presidio Fire Department provides fire and emergency services within the Presidio, and is the first responding unit on the Golden Gate Bridge, Doyle Drive, and Veterans Boulevard north of the MacArthur Tunnel. The Presidio Fire Department would also respond to accidents on Veterans Boulevard south of the MacArthur Tunnel if requested by the San Francisco Fire Department as part of a mutual aid agreement. Two fire stations are located near the project site. One station is located in the Presidio in Building 218 on Lincoln Boulevard in the Main Post. This station provides both fire and ambulance service. The other station is located in the Marin Headlands at Fort Cronkhite, in Building 1045 on Rodeo Beach. This station primarily serves Fort Cronkhite, Fort Barry, and Fort Baker and provides secondary response to the Presidio. The average response time for fire and emergency medical calls in the Presidio is less than three minutes (Trust, 2002).

The GGBHTD also provides fire and emergency tow truck service that respond to and clear accidents on Doyle Drive, Veterans Boulevard, and the Golden Gate Bridge. Its service area limits are U.S. 101 at Spencer Avenue to the north, Doyle Drive at Marina Boulevard and Richardson Avenue at Lyon Street to the east, and Veterans Boulevard at Lake Street to the south. GGBHTD has a maintenance facility at the Golden Gate Bridge Toll Plaza, with one fire truck, four tow trucks, and two pick-up trucks. This station is typically staffed with a

minimum of three public officers during most of the day, and at least two officers between 10:00 PM and 6:00 AM. GGBHTD also has a mutual aid agreement with the Presidio Fire Department and San Francisco Fire Department.

Outside the Presidio and within the project study area, fire protection and emergency medical services (paramedics) are served by the San Francisco Fire Department. There is a mutual aid agreement between the San Francisco and Presidio fire departments where it would allow either department to request assistance from the other in time of special need. There are five fire stations which serve the study area.

Temporary Impacts

Temporary impacts are the result of construction activities. The following is a description of the general construction activities in order to provide an overview of activities and material which will be involved in the construction of a new Doyle Drive.

The estimated construction period is between three and four years for all build alternatives. During the construction period there will be a disruption of normal activities within the Presidio resulting from the introduction of construction noise, a change in the visual setting, and movement of equipment and materials. Depending on what visitor activities are being pursued and what construction activities are being performed, the visitor experience to the Presidio may be degraded during the construction period as the normal scenic and tranquil setting in many areas may be disrupted by the sights and sounds of construction. Visitors to and those working in the Presidio, however, will still have full access and use of the facilities at the park.

Construction staging areas will vary by alternative. The Replace and Widen Alternative – No-Detour Option would only use the parking lot between the Post Exchange and Commissary as the primary staging area. For the Replace and Widen Alternative – With Detour Option the primary construction staging would include the parking lot and the footprint of both the Post Exchange (Buildings 605 and 606) and Commissary (Buildings 610 and 653). Both the Post Exchange and Commissary would be removed to accommodate the staging area under the Detour Option. The primary staging area for the Presidio Parkway Alternative and the Preferred Alternative will be the Post Exchange building footprint and parking lot. Each build alternative will use a secondary staging area on the parking lot between Buildings 230 (warehouse) and 1063 (Medical Supply warehouse). Access to the buildings adjacent to the staging areas and throughout the Presidio will be maintained throughout the construction period, although how people access buildings and where they will park may change when the construction details are finalized. Access to the Crissy Field Center will be maintained during construction along Mason Street under the Presidio Parkway or Preferred Alternatives.

All build alternatives will involve standard construction techniques and require large-scale construction equipment and labor-intensive activities.

The designated haul routes within the Presidio during the construction period are Mason Street, McDowell Avenue and Lincoln Boulevard. Traffic impacts are discussed later in this document.

Potential short-term impacts resulting from construction of the proposed project alternatives are discussed below. The discussion is presented by alternative and resource. If a resource is not discussed, then no temporary impacts are expected.

Alternative 1: No-Build

The No-Build Alternative would not result in any temporary community impacts.

Alternative 2: Replace and Widen

All build alternatives are anticipated to have similar temporary impacts on employment, utilities, and emergency services and therefore they are discussed together below.

Alternative 5: Presidio Parkway

All build alternatives are anticipated to have similar temporary impacts on employment, utilities, and emergency services and therefore they are discussed together below.

Preferred Alternative: Refined Presidio Parkway

The location of the temporary construction detour associated with the Preferred Alternative may result in a disruptive environment to the educational programs conducted at the Crissy Field Center. In addition, the Preferred Alternative will have similar temporary impacts on employment, utilities, and emergency services as all other build alternatives. These are discussed together below.

Alternatives 2: Replace and Widen, Alternative 5: Presidio Parkway, and Preferred Alternative

The following is a discussion of the temporary impacts on employment, utilities, and emergency services of all build alternatives.

Employment

Construction of any of the build alternatives will require a fairly large workforce. **Exhibit 3-10** shows the person-years of labor calculated for each alternative. It is anticipated that local employment will be created due to construction of the project and most of labor force will consist of workers already residing in the Bay Area. However, the need for special skilled labor or a shortage in the labor force may require workers to be obtained from elsewhere. The Bay Area has over one million rental units (U.S. Census 2000), which should adequately cover the temporary housing demand.

Exhibit 3-10
Potential Project Construction Employment

ALTERNATIVE	CONSTRUCTION ¹ (PERSON YEARS)	AVERAGE NUMBER OF WORKERS PER YEAR ²
No-Build	N/A	NA
Replace and Widen – No-Detour Option	772	154
Replace and Widen – Detour Option	864	173
Presidio Parkway Alternative	982	196
Preferred Alternative	982	246

Source: Parsons Brinckerhoff, May 2004. Bureau of Labor Statistics, available at:
<http://www.stats.bls.gov/blswage.htm>.

Notes:

¹Construction (person years) = Labor costs (\$) / Average annual wage for highway and street construction (\$).

Assumptions: Labor costs = 19% of construction costs. Average annual wage for highway and street construction = \$73,625 (Bureau of Labor Statistics)

²Average number of workers per year equal to construction person years divided by the total number of construction years (five years for Replace and Widen and Presidio Parkway Alternatives and four years for the Preferred Alternative).

Utilities

It is anticipated that certain components of the utility system in the Presidio will need to be temporarily relocated as part of the Doyle Drive Project. In those instances, temporary facilities will be provided during construction to maintain continuous utility operations.

There will 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.

Emergency Services

During the construction period, temporary road detours will be required to route traffic around construction areas. All detours will be designed to ensure emergency vehicle access. In general, vehicle travel through construction areas will be delayed due to unfamiliarity with detour routes and motorists slowing to view construction activities. Based on construction period traffic data (DKS 2004), emergency response times could increase by approximately three minutes. However, the response times will be improved by close coordination with the emergency services and familiarity with any detours.

Short-term closures will be required for various cross streets below Doyle Drive, which may affect emergency access routes. Closures will take place in off-peak hours, generally at night. The With Detour Option would likely have the greatest construction noise impacts on the Crissy Field Center due to the actual

construction of the detour, which would be placed in close proximity to the Center. If a special nighttime activity was planned at the Crissy Field Center, noisy construction operations in the vicinity could be suspended or rescheduled to reduce or eliminate the potential noise impacts. See Section 3.3.5 – Noise and Vibration for a more detailed discussion of the impacts of night-time construction activities. In addition, various ramps to Doyle Drive will experience temporary closures, which could affect emergency access and response. Coordination of the closures with appropriate emergency services will be addressed in the *Final Transportation Management Plan* prepared as part of this project (see **Appendix K** for the *Draft Transportation Management Plan*).

Permanent Impacts

Potential permanent impacts resulting from the proposed project alternatives are discussed below. The discussion is presented by alternative and resource. If a resource is not discussed, then no permanent impacts are expected.

Alternative 1: No-Build

The No-Build Alternative would not result in any permanent community impacts.

Alternative 2: Replace and Widen

Utilities and emergency services of the community impacts resource area may be affected by this alternative.

Utilities

The *South Access to the Golden Gate Bridge: Doyle Drive Project Utility Relocation Plan* assumes that all utilities affected by the proposed Doyle Drive Project alternatives would be relocated to provide the same level of service as the existing systems.

The water supply pump stations or reservoirs in the Presidio would not be affected. However, because pipelines of up to 250 millimeters (ten inches) in diameter would need to be relocated, two water mains would be relocated.

This Alternative would require the construction of a 610-millimeter (24-inch) stormwater interceptor to replace an existing ditch system on the north side of Doyle Drive in the vicinity of the Commissary. Placement of the storm lines would take place during the summer when stormwater flow rates are minimal as opposed to the critical winter months.

The relocation of high voltage power lines to underground conduits would occur before construction. The location is the north side of Doyle Drive at its east end. The 12 kV transmission line serving the Golden Gate Bridge would be relocated prior to removal of the existing facility. Underground transmission lines located along Crissy Field Avenue would also require relocation.

In addition, two 102-millimeter (four-inch) diameter gas lines located near the east end of the low-viaduct would require relocation.

Several communication ducts and associated cables would need to be relocated. The current system is entirely underground and, therefore, the form of relocation for these telecommunication lines would be temporary poles at an at-grade level. The underground communication lines (copper and fiber optic cables) located on the north side of Doyle Drive at its east end would be relocated before construction began.

In addition to the utilities described above, other elements which are not listed may also be relocated.

Emergency Services

Roadway improvements associated with this Alternative would provide some limited improvement in emergency access. New roadway and intersection configurations would have beneficial changes to existing emergency service routes and response times.

Alternative 5: Presidio Parkway

As with Alternative 2, utilities and emergency services would be affected by this alternative.

Utilities

The *South Access to the Golden Gate Bridge: Doyle Drive Project Utility Relocation Plan* assumes that all utilities affected by the proposed Doyle Drive Project alternatives would be relocated to provide the same level of service as the existing systems. For the Presidio Parkway Alternative, there would be changes to the stormwater system associated with the Tennessee Hollow drainage corridor. The plan to restore the Tennessee Hollow drainage corridor provides an opportunity to reroute some affected parts of the stormwater system to a discharge point in the proposed Tennessee Hollow corridor. This arrangement would simplify the stormwater system and minimize relocation costs.

The water supply pump stations or reservoirs in the Presidio would not be affected by this alternative. However, because pipelines of up to 250 millimeters (ten inches) in diameter would need to be relocated, three water mains would also need to be relocated.

This Alternative would require the relocation of the pump station in the vicinity of the Post Exchange and associated lines to maintain maintenance access and the relocation of the sewer main from the pump station behind Building 644 on Mason Street. Several gravity sewer and mains of up to 460 millimeters (18 inches) in diameter would also require relocation.

This Alternative would require the construction of two new stormwater interceptors, one along Lincoln Boulevard and the other to divert flow to the restored Tennessee Hollow drainage. A new outlet to the restored Tennessee

Hollow drainage would also be constructed. Placement of the storm lines would take place during the summer when the stormwater flow rates are minimal as opposed to the critical winter months.

Temporary high voltage distribution service installed at the beginning of the project would be moved underground after tunnel completion. Some high voltage power lines would be relocated in particular the 12 kV transmission line serving the Golden Gate Bridge would be relocated prior to removal of the existing facility.

Under this Alternative, the compressed natural gas vehicle fueling station operated by the Trust would need to be physically transferred from its original location to a location selected by the Trust. Existing pipelines of up to 150 millimeters (six inches) in diameter that are part of the distribution system would also need to be relocated.

Several communication ducts and associated cables would need to be relocated. The current system is entirely underground and, therefore, the form of relocation for these telecommunication lines would be temporary poles at an at-grade level.

The existing underground communication lines located under Lincoln Boulevard on the south side of Doyle Drive near the National Cemetery and the communication lines along Halleck Street would also be relocated as part of the reconstruction of these roadways.

In addition to the utilities described above, other elements which are not listed may also be relocated.

Emergency Services

The roadway configuration and improvements associated with the Presidio Parkway Alternative would provide improved access for emergency vehicles to and from the Presidio and surrounding areas.

To deal with emergencies in the tunnels of the Presidio Parkway Alternative, an emergency response plan would be developed and coordinated with various agencies including Caltrans, the California Highway Patrol, GGBHTD, the Trust and the San Francisco Fire Department.

Preferred Alternative: Refined Presidio Parkway

Impacts to utilities and emergency services under the Preferred Alternative will be the same as those described above for Alternative 5.

Alternative 2: Replace and Widen, Alternative 5: Presidio Parkway, and Preferred Alternative

All build alternatives are anticipated to have similar permanent impacts on employment and therefore they are discussed together in the employment related text that follows.

Employment

In addition to the temporary removal of buildings, each build alternative will require the permanent removal of buildings which in turn will affect the employees working in the building. **Exhibit 3-11** lists the buildings to be removed, the number of employees to be displaced and the alternative for which the removal is required. **Exhibit 3-12** provides a summary of employees displaced by alternative.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. Given the important and sensitive nature of the educational programs conducted at the Crissy Field Center and the possible affect on these programs due to the close proximity of the temporary construction detour, the Crissy Field Center operations will be temporarily relocated within the Presidio during the construction period. In addition, The Trust will have review and approval authority over all Trust owned utility relocations. No additional mitigation measures have been identified beyond those discussed which have been incorporated into the project design or the construction plan.

**Exhibit 3-11
Employees Permanently Displaced**

BUILDING	ORGANIZATION AFFECTED	EMPLOYEES	ALTERNATIVES FOR WHICH BUILDING WOULD BE REMOVED
201 ¹	Trust	10	Presidio Parkway – Circle Drive and Diamond Options, Preferred Alternative
204	Trust and NPS	0	Presidio Parkway – Circle Drive and Diamond Options, Preferred Alternative
205	Trust	0	Presidio Parkway – Circle Drive and Diamond Options, Preferred Alternative
230	Trust and NPS	10	Presidio Parkway – Circle Drive and Diamond Options, Preferred Alternative
231	Trust	8	Presidio Parkway – Circle Drive and Diamond Options, Preferred Alternative
605	Public Storage	1	Replace and Widen – With Detour Option; Presidio Parkway – Circle Drive and Diamond Options, Preferred Alternative
606	Public Storage	1	Replace and Widen – With Detour Option; Presidio Parkway – Circle Drive and Diamond Options, Preferred Alternative
610	Sports Basement	26	Replace and Widen – With Detour Option
1151	Presidio Community YMCA (pool)	20	Presidio Parkway – Circle Drive Option
1158	Presidio Dance Theatre	5	Replace and Widen – No-Detour Option; Presidio Parkway – Circle Drive and Diamond Options, Preferred Alternative
1182	Office for San Francisco Exploratorium	5	Replace and Widen – With Detour Option
1185	Office for San Francisco Maritime National Historic Park	5	Replace and Widen – With Detour Option

Source: The Presidio Trust, 2006; Judy Bretschneider, Presidio Dance Theatre, 2004. Data provided by Corey Olender, Woodmont Real Estate Services, 2004.

Note: ¹ Building 201 will be completely removed during construction of the Preferred Alternative but following construction, the top portion of the building will be returned to the site of the original building and be available for occupancy at a reduced number.

Exhibit 3-12
Employees Permanently Displaced by Alternative

ALTERNATIVE	EMPLOYEES
No-Build	0
Replace and Widen – No-Detour Option	5
Replace and Widen – With Detour Option	38
Presidio Parkway – Diamond Option	35
Presidio Parkway – Circle Drive Option	55
Preferred Alternative	35

3.2.5 Parking

As recommended in the DEIS/R (December 2005), the parking assessment should be updated periodically due to the dynamic nature of the Presidio building use. The following section presents results of a parking evaluation update prepared in November 2006, replacing the initial DEIS/R (December 2005) parking discussion.

The *Presidio Trust Management Plan* (PTMP) provides a vision for future development within the Presidio. Most of the redevelopment within the Presidio is targeted for the area surrounding the Doyle Drive corridor. The purpose of this section is to identify potential parking impacts as a result of the proposed project. A detailed description of the methodology and the results of an initial parking assessment can be found in the *Final Parking Impact Analysis*, September 2004. Subsequent to receiving comments from the public and the reviewing agencies, design modifications were made to Alternative 5 forming the Refined Presidio Parkway Alternative (Modified Hook Ramp and Diamond Options). At the same time, due to the dynamic nature of the Presidio building use, the Presidio Trust's building use assumptions changed which altered parking conditions. Therefore, subsequent to the identification of the Refined Presidio Parkway Alternative as the Preferred Alternative, an *Addendum*¹ updating the parking assessment was prepared in November 2006. The results documented herein correspond to the latest evaluation.

Regulatory Setting

Both the *National Environmental Policy Act* (NEPA) and the *California Environmental Quality Act* (CEQA) require the review of potential effects of a proposed project on the surrounding community, including potential parking impacts.

¹ The *Addendum to the Final Parking Impact Analysis* (November 2006) presents the updated assessment of the No-Build and the Preferred Alternatives in 2010 and 2030 in detail. The FEIS/R documents the summarized results of all alternatives for all scenarios considered.

In addition, the goals of the PTMP are also used as guidance for this parking analysis.

Methodology

The parking supply and demand for the No-Build Alternative were determined in order to establish a baseline scenario for those areas where parking spaces could be lost due to construction and operation of the Doyle Drive Project. Similarly, the supply and demand for each of the project alternatives were estimated for the construction period (temporary impacts), as well as the future operating period (permanent impacts). Potential parking impacts of each of the alternatives are identified based on the baseline parking surplus or deficiency of the No-Build Alternative.

The existing conditions scenario analyzes existing average weekday parking demand and compares it to the parking supply that is currently available to the general public. The construction period is assumed to take place in year 2010 when construction activities for the Doyle Drive Project would have the greatest effect on parking supply. The operating period for the proposed Doyle Drive Project is assumed to occur in year 2030.

A rate of 32.5 square meters (350 square feet) per space of unmarked pavement area, consistent with industry standards, is used to estimate parking supply for areas that would be relocated or modified by the project. Due to fluctuations in land use and parking area conditions, existing parking demand is calculated using building use assumptions provided by the Presidio Trust.

The study area for the parking analysis is determined based on the location of parking areas that could be affected due to construction activities or the actual Doyle Drive Project. Potential project-related impacts could be due to the construction of new facilities such as the detour facilities or space needed for construction staging. The construction period would be no more than five years with many activities in localized areas taking, on average, two years to complete. Most of the study area is concentrated on either side of Doyle Drive at the east end of the Presidio. An additional area on Rod Road in the Fort Scott area near the Park Presidio Interchange was also evaluated.

The analysis identifies potential alternative parking facilities to reduce the impact of the parking spaces eliminated by the Doyle Drive Project. The parking areas recommended for impact reduction are within walking distance, 400 meters (about one-quarter of a mile) or less, of the buildings affected by the loss of parking. Additional parking for some uses, including retail, medical and the Swords to Plowshares buildings (Buildings 1029 and 1030) were evaluated within a smaller area (200 meters, about one-eighth of a mile).

Due to the dynamic nature of Presidio building uses, quantifying the available parking supply and expected parking demand is a speculative exercise. Changes and variations to current land uses may occur that could have noticeable impacts on this parking assessment. Therefore, the *Parking Impact Analysis* should be

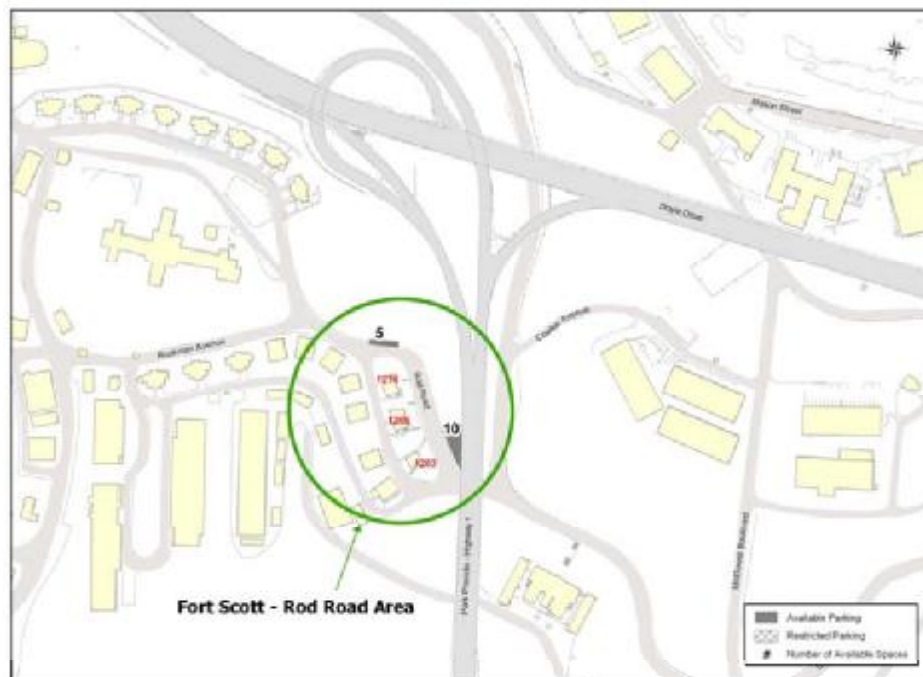
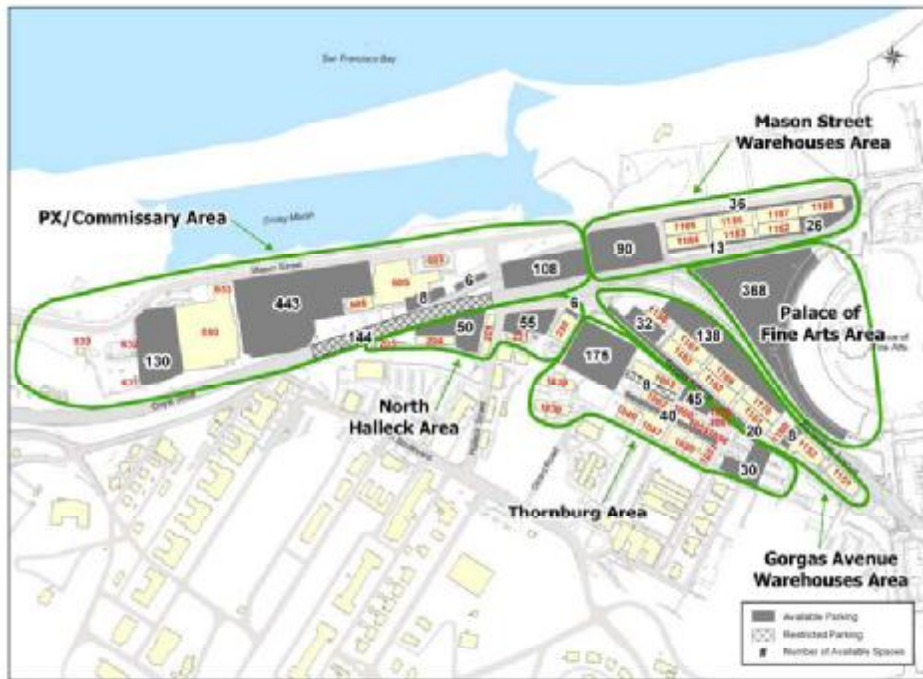
updated on a regular basis to reflect actual development within the Presidio for better assessment and more effective use of the parking facilities. For instance, the Presidio Trust intends to restore the Tennessee Hollow corridor, which will affect parking supply of the No-Build as well as the build alternatives. As the restoration project progresses and as further details concerning parking changes become available, future updates of the *Parking Impact Analysis* will reflect the modified parking supply.

Affected Environment

The boundaries for the parking areas that were used in this analysis are shown in **Exhibit 3-13** (on the following page).

As some parking areas within the Presidio are in a transitional state (that is, they are currently being used for activities related to ongoing projects or are closed due to security concerns), the *Parking Impact Analysis* and the *Addendum* evaluated only parking areas that are currently available to the general public.

Exhibit 3-13
 Parking Study Areas



**Exhibit 3-14
Existing Parking Conditions (Year 2006)**

AREA	SUPPLY	DEMAND	SURPLUS / DEFICIENCY	ADJUSTED SURPLUS / DEFICIENCY
	NUMBER OF SPACES			
Mason Street Warehouses	165	100	65	65
PX/Commissary	695	202	493	493
Gorgas Avenue Warehouses	198	265	-67	0
Thornburg Area	290	158	132	65
North Halleck Area	111	67	44	44
Fort Scott – Rod Road	15	15	0	0
Palace of Fine Arts	368	368	0	0
Total	1842	1176	666	666

Source: Parsons Brinckerhoff, Inc. November 2006.

Under existing conditions (year 2006), there is an overall surplus within the study area as shown in **Exhibit 3-14**.

Temporary Impacts

The temporary impacts analysis reflects conditions when construction activities for the Doyle Drive Project will have the most impact in terms of the number of parking spaces affected. It is assumed that this would be year 2010.

Construction of the entire Doyle Drive Project will take approximately four years with most activity at individual locations lasting, on average, about two years. For all Doyle Drive alternatives, parking supply under the construction scenario will be affected by the temporary loss of parking spaces due to construction staging and related activities. Parking needed for construction workers is not currently reflected in these numbers. Contractors will be required to provide employee parking in the staging areas identified and/or negotiate with the Presidio Trust to identify off-site parking areas and implement a shuttle system to worksites.

Temporary impacts will occur when the demand for parking will not be met by the available supply, excluding any parking deficiencies that will occur under the No-Build Alternative, as shown in **Exhibit 3-15**. All project alternatives are associated with unmet parking demand requiring temporary replacement parking.

Exhibit 3-15
Temporary Parking Impacts (Year 2010)

AREA	ADJUSTED SURPLUS/DEFICIENCY	UNMET PARKING DEMAND			
	ALTERNATIVE 1: NO-BUILD	ALTERNATIVE 2: REPLACE AND WIDEN – NO-DETOUR OPTION	ALTERNATIVE 2: REPLACE AND WIDEN – WITH DETOUR OPTION	ALTERNATIVE 5: PRESIDIO PARKWAY	PREFERRED ALTERNATIVE: REFINED PRESIDIO PARKWAY
Mason Street Warehouses	0	-3	0	0	-80
PX/Commissary	385	-156	0	-143	0
Gorgas Avenue Warehouses	0	-237	-155	-259	-269
Thornburg Area	-26	-39	-23	-191	-236
North Halleck Area	0	0	0	0	0
Fort Scott – Rod Road	0	0	0	-3	0
Palace of Fine Arts	0	-105	0	-258	-258
Total	358	-540	-178	-854	-843

Source: Parsons Brinckerhoff, November 2006.

Note: Negative numbers represent parking deficiencies beyond those identified under the No-Build conditions.

Alternative 2: Replace and Widen (No-Detour Option)

During the construction period, unmet parking demand would be observed in most parking areas except for the North Halleck Area and Fort Scott – Rod Road. A total unmet demand of 540 spaces would result within the study area.

Alternative 2: Replace and Widen (With Detour Option)

During the construction period, unmet parking demand would be observed in two parking areas, namely the Gorgas Avenue warehouses and the Thornburg Area. A total unmet demand of 178 spaces would result within the study area.

Alternative 5: Presidio Parkway

During the construction period, unmet parking demand would be observed in most parking areas except for the Mason Street warehouses and the North Halleck Area. A total unmet demand of 854 spaces would result within the study area.

Preferred Alternative: Refined Presidio Parkway

During the construction period, unmet parking demand will be observed in the Mason Street warehouses, Gorgas Avenue warehouses, Thornburg Area, and Palace of Fine Arts parking areas. As enough parking will be provided to meet the Crissy Center parking demand (at the location of Building 605 upon its demolition), unmet parking demand will not be observed in the PX/Commissary Area. Overall, a total unmet demand of 843 spaces will result within the study area.

Permanent Impacts

The potential long-term parking impacts associated with the build alternatives are shown in **Exhibit 3-16**. As with the construction scenario impacts, long-term parking impacts will occur when demand exceeds the available supply, excluding any parking deficiencies identified under No-Build Alternative. In most cases, the spaces lost during the construction period will be reinstated once the project is complete. Overall, all project alternatives will result in some unmet parking demand requiring replacement parking.

**Exhibit 3-16
Permanent Parking Impacts (Year 2030)**

AREA	ADJUSTED SURPLUS/ DEFICIENCY	UNMET PARKING DEMAND			
		ALTERNATIVE 1: NO-BUILD	ALTERNATIVE 2: REPLACE AND WIDEN – NO-DETOUR OPTION	ALTERNATIVE 2: REPLACE AND WIDEN – WITH DETOUR OPTION	ALTERNATIVE 5: PRESIDIO PARKWAY
Mason Street Warehouses	0	0	0	0	0
PX/Commissary	369	0	0	0	0
Gorgas Avenue Warehouses	0	0	-7	0	0
Thornburg Area	-26	-4	-13	-7	-142
North Halleck Area	0	0	0	0	0
Fort Scott – Rod Road	0	0	0	-3	0
Palace of Fine Arts	0	0	0	0	0
Total	343	-4	-20	-10	-142

Source: Parsons Brinckerhoff, November 2006.

Note: Negative numbers represent parking deficiencies beyond those identified under the No-Build conditions

Alternative 2: Replace and Widen (No-Detour Option)

Overall during the Doyle Drive Project operating period, an unmet parking demand of four spaces would be observed in the Thornburg Area.

Alternative 2: Replace and Widen (With Detour Option)

Overall during the Doyle Drive Project operating period, a total unmet parking demand of 20 spaces would be observed in the Gorgas Avenue warehouses and the Thornburg Area.

Alternative 5: Presidio Parkway

Overall during the Doyle Drive Project operating period, a total unmet parking demand of ten spaces would be observed in the Thornburg Area and Fort Scott – Rod Road.

Preferred Alternative: Refined Presidio Parkway

Overall during the Doyle Drive Project operating period, an unmet parking demand of 142 spaces will be observed in the Thornburg Area requiring replacement parking.

Temporary Avoidance, Minimization and Mitigation

The temporary avoidance, minimization and mitigation discussion focuses on the Preferred Alternative only.

Construction parking impacts will occur in several areas. The availability of replacement parking will depend on the type of construction activities taking place, their location, and duration. It is possible that some areas of replacement parking will be needed; however, their extent and duration will be dependent upon the availability and management of parking elsewhere within the Presidio. The parking study will be updated periodically to determine the location of available parking to address the temporary parking loss.

The Parade Grounds located to the southeast of the study area will be considered as replacement parking to accommodate the identified unmet demand. It will be a candidate location to stage buses and transport visitors to the Palace of Fine Arts via shuttle buses. The availability of parking at this location will depend on parking demand generated by additional land use and any modifications made to the parking supply by year 2010. With coordination, the shuttle service currently operated by the Presidio Trust might be used to transport individuals to and from their destinations. The Doyle Drive Project will compensate for additional shuttle service required during the construction period. Proper signage will be provided to inform motorists of any parking changes and to direct them to the available parking facilities. Detailed design of parking facilities affected by the Preferred Alternative will take pedestrian circulation, traffic safety, and parking access into consideration.

Temporary pedestrian and/or bicycle access will be provided on already designated bicycle/pedestrian paths and routes on either side of the project area on routes described in the *Presidio Trails and Bikeways Master Plan*.

Permanent Avoidance, Minimization and Mitigation

The permanent avoidance, minimization and mitigation discussion focuses on the Preferred Alternative only.

Permanent parking impacts will occur for the Preferred Alternative. The parking study will be updated periodically to determine the location of available parking to address the permanent parking loss. The Doyle Drive Project will also coordinate with the Trust to manage the available supply within the study area and in other nearby areas. If unmet parking demand remains, the Doyle Drive Project will be designed to provide a new parking facility in a potential area west of Halleck Street and south of the Main Post tunnels, as indicated by the Trust, since areas of deficiency are generally located to the south of Doyle Drive. Detailed design of parking facilities affected by the Preferred Alternative will take pedestrian circulation, traffic safety, and parking access into consideration. The detailed design will also comply with the ADA Standards for Accessible Design.

The area to the southeast corner of Girard and Eddie Roads, which may be converted to a parking facility to address some of the temporary unmet parking demand, may still be available in 2030.

3.2.6 Relocation

All build alternatives will result in the temporary and/or permanent removal of buildings in the project area. Estimates for temporary and permanent building removal were made with preliminary design drawings, and specific details regarding building removal will not be finalized until a preferred alternative is adopted and designed.

The build alternatives will require the removal of between 4,000 and 193,000 square feet of buildings, or less than one percent and 3.5 percent, respectively, of the 5.6 million total square feet of buildings identified in the PTMP.²

The Trust will be compensated for the temporary removal and return or permanent removal of Presidio buildings in the Presidio as part of the acquisition of interest and right of way process. For this analysis, it is assumed that the actual land will be transferred from the Trust to Caltrans through the FHWA, pursuant to FHWA's authority under 23 USC 317, as a Federal land transfer³ and the Trust will be compensated for the buildings that are in the alternatives' construction footprint. Implementation of the *Uniform Relocation Assistance and*

² PTMP, Attachment B: Final EIS Land Use Alternatives: Land Use Program by Planning Area, The Presidio Trust, 2001.

³ It is acknowledged that the assumptions used in this analysis could change based on the future negotiations of the transfer of land between the Presidio Trust and Caltrans through the HWA/FHWA, pursuant to FHWA's authority under 23 USC 317, as a Federal land transfer.

Real Property Acquisition Policies Act of 1970, as amended and the *Civil Rights Act of 1964*, providing for relocation assistance services to affected renters and tenant businesses, would occur for any displaced occupants of the Presidio. These Acts require that residential and commercial property owners be paid fair market value of any property acquired as a result of the project. The data regarding building use and tenants would be updated in the *Community Impact Assessment*, as warranted. See **Exhibit 1-2** in Chapter 1 for the location and identification number of buildings discussed below.

Temporary Impacts

A number of temporary relocations related to project construction have been identified.

Alternative 1: No-Build

The No-Build Alternative would not require any temporary building removals.

Alternative 2: Replace and Widen

The Replace and Widen Alternative – With Detour Option would require the removal of four Mason Street warehouses (Buildings 1182, 1183, 1184, and 1185) in order to accommodate the temporary detour for the Marina connector ramp. At this time, it is not known if the removal of these buildings would be temporary or permanent. Assuming removal is temporary, the total building space removed would be approximately 4,705 square meters (50,644 square feet). Organizations affected by the removal of the Mason Street warehouses during the construction period include the San Francisco Exploratorium administrative offices (Building 1182) and office for the San Francisco Maritime National Historic Park (Building 1185). Buildings 1183 and 1184 are owned by the Trust but are currently vacant.

Alternative 5: Presidio Parkway

The Presidio Parkway Alternative would not require the temporary removal of any buildings although Building 106 would be temporarily closed for approximately 18 months during the construction period.

Preferred Alternative: Refined Presidio Parkway

The Preferred Alternative will require the temporary removal of the upper floor of Building 201 in order to construct the Main Post tunnels. The total building space temporarily removed will be 532 square meters (5,272 square feet). Building 106 will be temporarily closed for approximately 18 months during the construction period.

Permanent Impacts

Exhibit 3-17 lists the buildings that would be permanently removed by each build alternative.

Alternative 1: No-Build

The No-Build Alternative would not require the permanent removal of any buildings.

Alternative 2: Replace and Widen

The Replace and Widen Alternative – No-Detour Option would require the removal of Building 1158, currently occupied by the Presidio Dance Theatre. The Replace and Widen Alternative – With Detour Option would require the removal of Buildings 605 and 606 (Post Exchange) and Building 610/653 (Commissary). The removal of these buildings would affect the current tenants, including the Sports Basement (Buildings 610/653) and Public Storage (Buildings 605/606).

**Exhibit 3-17
Buildings Temporarily Removed and Returned or Permanently Removed by Alternative**

ALTERNATIVE	TEMPORARILY REMOVED AND RETURNED	VACANT DURING CONSTRUCTION	PERMANENTLY REMOVED	TOTAL BUILDING AREA PERMANENTLY REMOVED SQ METERS (SQ FEET)
NO-BUILD	None	None	None	None
Replace and Widen – No-Detour Option	None	None	Building 1158	387 (4,166)
Replace and Widen – Detour Option	Buildings 1182*, 1183*, 1184*, 1185*	None	Buildings 605, 606, 610, 653	5,436 (58,513)
Presidio Parkway – Diamond Option	None	Building 106*	Buildings 201*, 204*, 205, 230*, 231, 605, 606, 670*, 1158	8,593 (92,494)
Presidio Parkway – Circle Drive Option	None	Building 106*	Buildings 201*, 204*, 205, 230*, 231, 605, 606, 670*, 1151*, 1158	9,699 (104,393)
Presidio Parkway – Merchant Road Slip Ramp Option	None	None	Buildings 1253, 1254, 1255, 1256	805 (8,665)
Preferred Alternative	Building 201* (top portion only)	Building 106*	Buildings 204*, 205, 230*, 231, 605, 606, 670*, 1158	8,061 (88,329)

* National Historic Landmark District (NHL) contributors

Note: Under the Preferred Alternative the top portion of Building 201 (approximately 532 square meters [5,727 square feet]) will be returned following the completion of construction activities.

Alternative 5: Presidio Parkway

The Presidio Parkway Alternative would require the permanent removal of Buildings 201, 204, 205, 230, 231, 605, 606, 670, and 1158. Buildings 201, 204, 205, 230 and 231 are occupied by the Presidio Trust and National Park Service (NPS) and would require relocation. Building 670 is vacant while Buildings 605 and 606 are occupied by Public Storage and Building 1158 is occupied by the Presidio Dance Theatre.

The Circle Drive Option would require the permanent removal of Building 1151 (the YMCA pool) in addition to those listed above. Both the Diamond and Circle Drive Options have a slip ramp option at Merchant Road. The Merchant Road Slip Ramp Option would also require the removal of the Armistead Road Buildings 1253, 1254, 1255 and 1256, all of which are residential buildings.

Preferred Alternative: Refined Presidio Parkway

The Preferred Alternative will require the permanent removal of Buildings 201, 204, 205, 230, 231, 605, 606, 670, and 1158. Although the top portion of Building 201 will be returned to the site of the original building following construction of the roadway.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. Avoidance is a primary consideration in the development and screening of project alternatives. Minimizing the impacts to buildings was considered throughout the design of the Preferred Alternative and temporary relocation – as part of the Alternative’s design – was a key component. As a result, property impacts have been minimized.

To mitigate the temporary closure of Building 106 during the construction period, the tenant will be temporarily relocated to a suitable location within the Presidio. Direct property acquisition will be consistent with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended and the *Civil Rights Act of 1964*. The project proponent will provide relocation assistance services to affected homeowners, renters, and tenant businesses. In addition, property owners will be compensated in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* and other applicable law. The compensation will be determined and implemented as part of the right of way acquisition process. **Appendix J** provides a summary of the Caltrans relocation benefits program.

3.2.7 Environmental Justice

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

Regulatory Setting

Federal laws and regulations guide the analysis of environmental justice.

Executive Order No. 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (signed by President Clinton on February 11, 1994) – directs Federal agencies to achieve environmental justice by identifying and addressing disproportionately high and adverse human health and environmental effects, including interrelated social and economic effects of the programs, and activities on minority populations and low-income populations of the United States.

Title VI of the Civil Rights Act of 1964 and related statutes – prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving Federal financial assistance. Direct property acquisition under the Doyle Drive Project alternatives would require implementation of this *Act* along with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*.

As defined in *Executive Order 12898* and subsequent agency guidance, the term “minority” includes any individual who is an American Indian or Alaskan Native, Asian or Pacific Islander (including Native Hawaiian), Black/African American (not of Hispanic origin), or Hispanic/Latino. The term “low-income” is defined in accordance with *Executive Order 12898* and agency guidance as a person with household income at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines (California Department of Transportation, *Desk Guide: Environmental Justice in Transportation Planning and Investments*, January 2003).

Minority and/or low-income populations are identified when: (a) the minority or low-income population of the affected area exceeds 50 percent; or (b) the minority or low-income population percentage of the affected area is meaningfully greater than the minority or low-income population percentage in the general population. For the purposes of this analysis, this difference was assumed to be more than ten percentage points. The study area for environmental justice analyses included U.S. Census Tracts within the project study area and adjacent tracts in which direct access patterns may be modified. The minority and/or low-income populations within these census tracts were compared to the city and county of San Francisco and the Bay Area as a whole.

Affected Environment

The study area for the analysis of environmental justice is comprised of the Presidio (census tract 0601) and 16 surrounding tracts where project-related effects might occur (see **Exhibit 3-9**). The 2000 U.S. Census race data in this section (summarized in **Exhibit 3-18** on the following page) shows that none of the minority (non-white) populations comprise more than 50 percent of the population as a whole within the study area. The data indicates that the minority populations within the study area as compared to the city and county of San

Francisco or the Bay Area is not greater than ten percentage points for any group. As such, the study area does not have a large minority population.

Poverty status was used to identify populations as low-income. These data are summarized in **Exhibit 3-19** (on the following pages). Poverty status, as defined by the U.S. Census, is determined by comparing a person's total family income with the poverty thresholds appropriate for that person's family size and composition. For example, the threshold for a family comprised of two adults and one child is \$16,227 (U.S. Census Bureau, Housing and Household Economic Statistics Division, *Poverty Thresholds 2006*).

For the census tracts within the study area, the percent of individuals below the poverty level ranges from 3.3 percent to 17.3 percent. On average, the percent below poverty level is 6.8 percent. **Exhibit 3-19** shows that the study area does not have a majority (more than 50 percent) of individuals with incomes below the poverty level. Also, the overall average is less than the city and county of San Francisco (6.8 percent versus 11.3 percent) and the Bay Area as a whole (6.8 percent versus 8.6 percent). An impact to environmental justice communities may occur even in areas that do not have a majority of low-income or minority populations.

The Presidio Trust and the National Park Service (NPS) have several outreach programs located in the project study area that are characterized as being oriented towards populations that are typically underserved in the national parks, primarily minority and/or low-income populations. Based on correspondence memorandums from the Golden Gate National Parks Conservancy (GGNPC), almost 18,000 people representing underserved populations, or about half of all visitors, used the Crissy Field Center between March 2003 and March 2004. The Archaeology Lab provides educational programs in partnership with the Crissy Field Center and targets many of the same groups. In addition, the San Francisco Conservation Corps serves minority and/or low-income populations. Previously located in Building 1163, which is within the Doyle Drive study area, it has since moved to Building 1243 which is outside of the area.

Exhibit 3-18
Population and Race Characteristics 2000

SAN FRANCISCO COUNTY CENSUS TRACTS WITHIN THE STUDY AREA	POPULATION	% WHITE ALONE	% BLACK OR AFRICAN AMERICAN ALONE	% AMERICAN INDIAN AND ALASKA NATIVE ALONE	% ASIAN ALONE	% NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE	% HISPANIC ¹	% OTHER ²
0126	4,915	86.0%	0.4%	0.0%	9.4%	0.2%	3.7%	3.9%
0127	3,497	87.4%	0.1%	0.0%	9.0%	0.0%	2.9%	3.5%
0128	4,209	84.8%	0.5%	0.0%	8.4%	0.4%	3.3%	5.9%
0129	5,706	84.2%	0.2%	0.2%	12.2%	0.0%	5.0%	3.2%
0130	4,130	86.6%	0.3%	0.4%	10.2%	0.2%	4.3%	2.3%
0132	4,436	87.5%	0.3%	0.2%	10.3%	0.0%	2.8%	1.7%
0133	4,145	86.5%	0.7%	0.4%	5.7%	0.4%	4.8%	6.2%
0154	5,762	69.5%	3.4%	0.3%	20.0%	0.3%	7.5%	6.5%
0156	2,821	57.9%	3.8%	0.6%	32.6%	0.0%	5.2%	5.1%
0157	6,875	59.2%	8.1%	0.6%	24.1%	0.5%	8.0%	7.5%
0401	4,348	58.3%	1.7%	0.2%	33.7%	0.2%	5.7%	6.1%
0402	5,364	54.1%	0.5%	0.3%	39.7%	0.0%	3.8%	5.4%
0426	7,200	55.2%	0.7%	0.2%	38.4%	0.1%	5.2%	5.5%
0451	5,102	43.6%	2.5%	0.2%	50.6%	0.0%	3.7%	3.1%
0452	6,695	47.5%	0.7%	0.5%	44.2%	0.0%	3.2%	7.0%
0476	5,431	42.8%	1.9%	1.4%	51.3%	0.1%	3.7%	2.5%
0601	2,338 ³	81.5%	2.8%	1.5%	4.9%	0.0%	9.6%	9.3%
Study Area Total or Average	82,870	69.0%	1.7%	0.4%	23.8%	0.1%	4.9%	5.0%
City & County of San Francisco	776,733	49.6%	7.6%	0.5%	30.9%	0.5%	14.1%	11.0%
Bay Area	6,783,760	58.0%	7.4%	0.6%	19.0%	0.5%	19.4%	14.5%

Source: 2000 U.S. Census.

Notes: ¹ Percentages do not add to 100% because Hispanic is not counted as a separate race in the U.S. Census.

² Includes "some other race alone" and "two or more races."

³ Data from the Presidio Trust, June 2004.

**Exhibit 3-19
Poverty Status 2000**

SAN FRANCISCO COUNTY CENSUS TRACTS WITHIN THE STUDY AREA	ALL INCOME LEVELS (INDIVIDUALS)	BELOW POVERTY LEVEL (INDIVIDUALS)	PERCENT BELOW POVERTY LEVEL
0126	4,915	177	3.6%
0127	3,497	141	4.0%
0128	4,209	146	3.5%
0129	5,706	211	3.7%
0130	4,130	153	3.7%
0132	4,436	147	3.3%
0133	4,145	141	3.4%
0154	5,662	346	6.1%
0156	2,776	313	11.3%
0157	5,379	695	12.9%
0401	4,217	381	9.0%
0402	5,337	364	6.8%
0426	7,200	531	7.4%
0451	5,102	407	8.0%
0452	6,668	571	8.6%
0476	5,431	427	7.9%
0601	2,236	387	17.3%
Study Area Total or Average	81,046	5,538	6.8%
City & County of San Francisco	765,356	86,585	11.3%
Bay Area	6,661,540	573,333	8.6%

Source: 2000 U.S. Census, Table QT-P34.

Buildings 1029 and 1030 are home to the community-based, nonprofit Swords to Plowshares. Swords to Plowshares provides counseling, employment and training, housing, and legal assistance to veterans in the San Francisco Bay Area. Part of their mission is to reduce homelessness and poverty among veterans. According to the website, Swords to Plowshares provides assistance to nearly 1,500 veterans in need each year (www.swords-to-plowshares.org/FAQ.htm).

Temporary Impacts

Transportation projects can potentially create social impacts on a community by affecting transportation choices or community facilities that are used by minority

or low-income populations. A review of population and income (poverty status) data indicate that the study area does not contain higher than average concentrations of minority and/or low-income groups. Therefore, these groups could not be subject to disproportionate impacts.

The potential for negative impacts to minority and/or low-income residents was evaluated for the Presidio facilities that are used by these groups. This analysis looked at the changes, both temporary and permanent, to the buildings used for these programs and access, both transit and private vehicles, to these buildings. Based on the analysis it is determined that minority and/or low-income residents would not be affected disproportionately by the project.

Alternative 1: No-Build and Alternative 2: Replace and Widen

Under these alternatives, Building 603, which currently houses the Crissy Field Center, would be maintained for cultural and educational purposes. The building would not be temporarily displaced by either alternative. Also, Buildings 1151 and 1152, which are currently occupied by the YMCA pool and gym, respectively, and the two Swords to Plowshares buildings (Buildings 1029 and 1030) would not be temporarily displaced by either alternative. Access to all facilities, including *Americans With Disabilities Act* (ADA) approved access to the Crissy Field Center, would be maintained during the construction period and during the long-term operation of Doyle Drive.

No adverse impacts to community facilities serving minority or low-income populations would occur with these alternatives.

Alternative 2: Replace and Widen

Temporary impacts resulting from Alternative 2 would be similar to those of the No-Build Alternative as discussed above, with the exception of temporary noise impacts to the Crissy Field Center for the With Detour Option which would place the detour in close proximity to the Center. As discussed in the Noise and Vibration Section of this document, with the possible exception of pile driving construction, noise levels would be in the range of 85-90 dBA within 15 meters (50 feet) of the corridor. Operational as well as construction noise impacts during the construction phase of the proposed project could be minimized by management of the Crissy Field Center and the construction contractor. Together, they could aid in reducing or eliminating potential noise impacts through careful coordination between noisy construction activities and noise sensitive activities at the Crissy Field Center.

No adverse impacts to community facilities serving minority or low-income populations would occur with this alternative.

Alternative 5: Presidio Parkway

Under the Presidio Parkway Alternative – Diamond Option there would be no temporary displacement of Buildings 603, 1029, 1030, 1151 and 1152. Access to

all facilities, including ADA approved access to the Crissy Field Center, would be maintained during construction of Doyle Drive.

No adverse impacts to community facilities serving minority or low-income populations would occur with this alternative.

Preferred Alternative: Refined Presidio Parkway

No adverse impacts to community facilities serving minority or low-income populations will occur with the Preferred Alternative. Access to all facilities, including ADA approved access to the Crissy Field Center via Mason Street, will be maintained during construction of Doyle Drive. Based on the noise analysis provided in the Noise and Vibration section, it was determined that operation of the temporary construction detour under a closed window condition will not have noise level impacts inside the Crissy Field Center that approach or exceed the FHWA Interior Noise Abatement Criteria (NAC) of 52 dBA. However, it may not be feasible for the Crissy Field Center to operate under a closed window condition for the duration of the temporary construction detour.

Permanent Impacts

Alternative 1: No-Build

No adverse impacts to community facilities serving minority or low-income populations would occur with this alternative.

Alternative 2: Replace and Widen

No adverse impacts to community facilities serving minority or low-income populations would occur with this alternative.

Alternative 5: Presidio Parkway

Under the Presidio Parkway Alternative – Diamond Option there would be no permanent displacement of Buildings 603, 1029, 1030, 1151 and 1152. Building 1151 (YMCA Pool) would, however, be permanently displaced with the Presidio Parkway Alternative - Circle Drive Option. However, because the use of this facility is not oriented towards serving minority and/or low-income populations, the displacement of this building would not disproportionately impact environmental justice populations. Access to all facilities, including ADA approved access to the Crissy Field Center, would be maintained during the long-term operation of Doyle Drive. No perceptible noise impacts would occur at the Crissy Field Center because traffic would be in tunnels in this area; therefore, noise is predicted to decrease.

No adverse impacts to community facilities serving minority or low-income populations would occur with this alternative.

Preferred Alternative: Refined Presidio Parkway

No adverse impacts to community facilities serving minority or low-income populations will occur with the Preferred Alternative. Access to all facilities,

including ADA approved access to the Crissy Field Center, will be maintained during the long-term operation of Doyle Drive.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. Recognizing the desirability to minimize or eliminate the potential for construction noise impacts at the Crissy Field Center and its many educational programs, the Crissy Field Center operations will be temporarily relocated within the Presidio during the construction period. It has been determined that the temporary relocation is a feasible and reasonable mitigation effort which will preserve the continued existence of the Crissy Field Center programs in a quieter environment.

No additional mitigation and avoidance measures will not be required because it is not anticipated that the project would disproportionately impact either minority or low-income populations.

3.2.8 Traffic and Transportation

This section presents a summary of existing and future traffic and transportation conditions, including pedestrian and bicycle facilities, within the Doyle Drive Project study area. Detailed information regarding methodology, traffic data, and projections can be found in the *South Access to the Golden Gate Bridge: Doyle Drive Project Revised Traffic and Transportation Study*, December 2004.

In response to comments received during the public circulation period of the DEIS/R and to address traffic circulation, tidal inundation issues, the elimination of the underground parking below Doyle Drive, and the provision of additional surface parking to more closely match the existing condition, some refinements were made to the Presidio Parkway Alternative with the Diamond Option. These refinements were selected as the Preferred Alternative in August, 2006. Additional traffic modeling was conducted, as well as an expansion of the traffic study to include analysis of interchanges in several neighborhoods. An addendum to the *December 2004 Traffic Study* was produced in October 2006 which concluded that the modifications to Alternative 5 did not provide any additional substantial impacts to traffic.

Methodology

An inventory of transportation facilities within the study area was conducted by the project team. Following this inventory, existing traffic and facility data were obtained from local, regional, and state agencies. Using these data, approved regional traffic models⁴ were used to project future travel conditions on the study area roadways for each alternative.

⁴ This study used a version of the San Francisco Countywide Travel demand model which was enhanced for this project. This model is consistent with assumptions for the last adopted MTC Regional Transportation Plan Forecasts (2002).

All alternatives were tested using the San Francisco County Transportation Authority's traffic demand model (SF-TDM). Each alternative assumes roadway and access changes anticipated through the redevelopment of the Presidio. In particular, adjustments were made to reflect the redevelopment of the Letterman Digital Arts Center as described in the *Letterman EIS and Letterman Redevelopment Richardson Avenue Access Traffic Operations Analysis*, March 2001.

Year 2000 data were used for the base year analysis. Economic conditions and employment destinations have resulted in variations in traffic volumes in the project study area since initial data were collected in April and May, 2000. Since that time, regularly assembled data for the Golden Gate Bridge have suggested that both daily and highest hourly traffic volumes have actually decreased for the same time periods between 2000 and 2006. Thus, conditions from 2000 are appropriate to designate as a base year.

The design year for a transportation project is generally targeted at 20 years from completion of the project. Based on a construction start of late 2009, and using the longest construction period of five years, the design year would be 2034 (2009+5+20). Therefore, 2035 traffic volume projections should be used to encompass all alternatives. Because population and employment are not projected to increase in San Francisco according to the available data between 2030 and 2035, the maximum traffic volumes are projected to occur in 2030 and level-off or decrease by 2035. Hence using the 2030 traffic volumes for the design year is the most conservative approach when considering a design year out to 2034.

Traffic performance related to congestion is defined as level of service (LOS). LOS is a measurement term used to describe operational conditions along a roadway. It generally describes travel speed and delay, freedom to maneuver, traffic interruptions, and comfort and convenience. This measure is defined by the Transportation Research Board using published quantitative methods. There are six levels, ranging from LOS A which represents the best operating conditions, to LOS F where demand exceeds capacity. Different thresholds for LOS categories exist for intersections, highway segments, urban street segments and weaving. A summary of the LOS definitions is provided in **Exhibit 3-20** on the following page.

Exhibit 3-20
Level of Service Criteria

		LEVEL OF SERVICE	
CRITERIA	MEASUREMENT	THRESHOLD	
Signalized Intersections	Average Delay (seconds per vehicle) All Approaches	A: Delay \leq 10 B: 10 < Delay \leq 20 C: 20 < Delay \leq 35 D: 35 < Delay \leq 55 E: 55 < Delay \leq 80 F: Delay > 80	
All-Way Stop Controlled Intersections	Average Delay (seconds per vehicle) All Approaches	A: Delay \leq 10 B: 10 < Delay \leq 15 C: 15 < Delay \leq 25 D: 25 < Delay \leq 35 E: 35 < Delay \leq 50 F: Delay > 50	
2-Way Stop Controlled Intersections	Average Delay (seconds per vehicle) Worst Approach	A: Delay \leq 10 B: 10 < Delay \leq 15 C: 15 < Delay \leq 25 D: 25 < Delay \leq 35 E: 35 < Delay \leq 50 F: Delay > 50	
Highway Segment	Average Density (Vehicles per lane per mile)	A: Density \leq 11 B: 11 < Density \leq 18 C: 18 < Density \leq 26 D: 26 < Density \leq 35 E: 35 < Density \leq 45 F: Density > 45 ¹	
Urban Street Segment – Class I	Average Travel Speed	A: Speed > 42 B: 34 < Speed \leq 42 C: 27 < Speed \leq 34 D: 21 < Speed \leq 27 E: 16 < Speed \leq 21 F: Speed \leq 16	
Urban Street Segment – Class II	Average Travel Speed	A: Speed > 35 B: 28 < Speed \leq 35 C: 22 < Speed \leq 28 D: 17 < Speed \leq 22 E: 13 < Speed \leq 17 F: Speed \leq 13	
Urban Street Segment – Class III	Average Travel Speed	A: Speed > 30 B: 24 < Speed \leq 30 C: 18 < Speed \leq 24 D: 14 < Speed \leq 18 E: 10 < Speed \leq 14 F: Speed \leq 10	
Urban Street Segment – Class IV	Average Travel Speed	A: Speed > 25 B: 19 < Speed \leq 25 C: 13 < Speed \leq 19 D: 9 < Speed \leq 13 E: 7 < Speed \leq 9 F: Speed \leq 7	
Weaving	The length of the weaving section, the total volume on the segment, and volume of weaving traffic all contribute to the LOS.		

Source: Highway Capacity Manual, 2000, Highway Design Manual, 2001.

Note: ¹ For a free-flow segment at 50 miles per hour the criteria is a density of 43 vehicles.

Affected Environment

Doyle Drive, the southern approach of US 101 to the Golden Gate Bridge, is 2.4 kilometers (1.5 miles) long with six traffic lanes. There are three San Francisco approach ramps which connect to Doyle Drive: one beginning at the intersection of Marina Boulevard and Lyon Street; one at the intersection of Richardson Avenue and Lyon Street; and one where Veterans Boulevard (State Route 1) merges into Doyle Drive (approximately 1.6 kilometers (one mile) west of the Marina Boulevard approach). Doyle Drive passes through the Presidio on an elevated concrete viaduct (low-viaduct) and transitions to a high steel truss viaduct (high-viaduct) as it approaches the Golden Gate Bridge Toll Plaza.

Currently, Doyle Drive has nonstandard design elements, including travel lanes from 2.9 to 3 meters (9.5 to 10 feet) in width, no fixed median barrier, no shoulders, and exit ramps that have tight turning radii. Adjacent to the structure on the north side is an existing access sidewalk, which is fenced off from adjacent land uses and contains several stairwells that are not compliant with the *American with Disabilities Act (ADA)*. Designated pedestrian and bicycle paths located throughout the Presidio and include Bay Trail, Presidio Promenade, and the Golden Gate Promenade. These trails are designated as bicycle and pedestrian routes in the *Presidio Trails and Bikeways Master Plan*.

Because the number of lanes is restricted on the Golden Gate Bridge and on Doyle Drive, the direction of the two center lanes (on the bridge) is changed daily, depending upon traffic demands. During peak⁵ traffic hours, plastic pylons are manually moved to provide a median lane as well as to reverse the direction of traffic flow for center lanes. Further, the Toll Plaza contains more lanes than the bridge to allow for faster processing of toll collection, while maintaining adequate traffic flow and capacity on the Bridge. The number of lanes on Doyle Drive near the Toll Plaza varies in order to be consistent with the available lanes through the Toll Plaza in both directions. Further, the Toll Plaza contains more lanes than the bridge to allow for processing of toll collection while maintaining bridge traffic capacity.

Existing Traffic Conditions

Doyle Drive is classified as a multi-lane conventional highway with a posted speed of 45 miles per hour (mph) for its mainline section and 35 mph for its ramp and weaving sections.⁶ Generally, Doyle Drive operates as a transitional roadway: at the west terminus, near the Golden Gate Bridge, it operates like a free-flow highway, while at the east terminus it operates like an arterial roadway meeting local streets. During the weekday AM peak hour, the peak direction is southbound. The peak direction during the weekday PM peak hour is northbound.

⁵ Peak hours refer to the times generally from 7:45 am to 8:45 am and 5:00 pm to 6:00 pm on weekdays. The weekend peak hour is generally assumed to be 4:00 to 5:00 pm.

⁶ In traffic analysis, weaving refers to the back and forth movement of vehicles between lanes primarily where vehicles are entering or leaving the highway.

The 2.4 kilometer (1.5 miles) Doyle Drive roadway is composed of the following operational segments:

- Veterans Boulevard to south of Merchant Road. This segment includes seven traffic lanes that generally operate as four lanes in the peak direction and three lanes in the non-peak direction using reversible lanes. Much of this segment requires lane changes and weaving associated with the Golden Gate Bridge Toll Plaza, Merchant Road ramps (to/from Golden Gate Bridge viewing area and the Presidio), and Veterans Boulevard ramps.
- Veterans Boulevard to Marina Boulevard Access Ramps. This segment includes six lanes of traffic that generally operate as three lanes in the peak direction, two lanes in the non-peak direction, and one lane unused as a buffer. In the morning peak, four lanes are provided in the peak (southbound) direction, and two in the non-peak (northbound) direction.
- Richardson Avenue, Lyon Street to Marina Boulevard Access Ramps. This segment includes one roadway that transitions to an urban street with three lanes of traffic in each direction. The portion of this segment closer to Doyle Drive operates with two highway lanes in the northbound direction, and three highway lanes in the southbound direction. A new Richardson Avenue northbound slip ramp has recently been opened north of Lyon Street to connect to Marshall Street and Gorgas Avenue, providing new access into the Main Post and Letterman areas of the Presidio.
- Marina Boulevard Access Ramps to Lyon Street (Marina connector). This segment includes a single roadway with five traffic lanes. Plastic pylons are used to reverse, reduce, and divide the traffic varying the facility from two lanes near Lyon Street in each direction to one lane near the Richardson Avenue ramp connections. Other lanes are used as buffer zones when not used for traffic.

Intersection Level of Service

Exhibit 3-21, provides the existing morning (AM), evening (PM), and weekend Level of Service (LOS) and delay by intersection. The congested intersections on Marina Boulevard at Broderick and Divisadero Streets (LOS F) are a result of the heavy volumes traveling through these unsignalized intersections.

Exhibit 3-21
Intersection Level of Service for Existing Conditions

INTERSECTION			AM PEAK HOUR		PM PEAK HOUR		WEEKEND PEAK HOUR	
No.	NORTH/SOUTH	EAST/WEST	LOS	DELAY ¹	LOS	DELAY ¹	LOS	DELAY ¹
Signalized Intersections								
1	Lyon	Marina	B	13	B	18	B	20
2	101 / Richardson	Francisco	C	34	B	10	B	11
12	101 / Richardson	Chestnut	B	13	B	15	B	12
13	101 / Richardson	Lombard	B	10	A	5	A	7
14	Broderick	Lombard	C	21	C	25	B	18
17	Veterans	Lake	B	17	C	21	B	15
Stop Controlled Intersections								
3	Lincoln (N)	GGB Viewing Area	B	12	B	12	B	11
4	Lincoln (S)	Merchant	A	10	B	11	A	5
5	Girard	Lincoln	A	<1	A	<1	A	<1
6	Halleck	Mason	A	6	A	6	A	6
10	Broderick	Marina	F	59	F	>100	F	>100
11	Divisadero	Marina	F	79	F	>100	F	>100
15	Lyon	Lombard Gate	D	29	C	18	B	13
16	Presidio	Pacific	C	16	C	19	C	19
18	Merchant	GGB Viewing Area	A	9	B	13	B	12

- Notes: 1. Delay measured in seconds per vehicle
 2. Intersections 7 through 9 do not exist today
 3. Weekend peak hour congestion varies significantly depending on weather and events
 4. Existing traffic conditions refer to post FasTrak installation at the Golden Gate Bridge toll plaza and post stop sign installation on Marina Boulevard.

Source: DKS Associates, 2004 from HCM 2000 methodology

Segment Level of Service

Exhibit 3-22 (on the following page) contains existing LOS and vehicle density for the highway segments within the project area. The peak direction of Doyle Drive traffic is near the preferred minimum performance standard of LOS D.

Exhibit 3-23 (on the following page) identifies the four urban street segments evaluated in the project area including the segment classification and existing LOS. Each of the urban street segments is estimated to operate at acceptable levels of service (LOS D or better) during peak hours.

Exhibit 3-22
Peak Hour Highway Segment Level of Service for Existing Conditions

SEGMENT		AM		PM		WEEKEND	
		LOS	DENSITY ¹	LOS	DENSITY ¹	LOS	DENSITY ¹
1	US 101 Southbound between the Merchant Road Ramps and Veterans Blvd	D	31	B	16	C	23
2	US 101 Northbound between Veterans Blvd and the Merchant Road Ramps	C	20	D	28	C	23
3	US 101 Southbound between Veterans Blvd and Marina Blvd access ramps	D	26	D	26	C	24
4	US 101 Northbound between Marina Blvd access ramps and Veterans Blvd	B	14	D	31	B	18
9	Veterans Blvd Southbound between US 101 and the Veterans Blvd Tunnel	C	24	C	23	C	22
10	Veterans Blvd Northbound between the Veterans Blvd Tunnel and US 101	C	24	D	28	C	20
11	US 101 Southbound between Veterans Blvd off and on-ramps	D	28	B	13	C	19
12	US 101 Northbound between Veterans Blvd on and off-ramps	A	11	C	24	B	14
13	US 101 Southbound between Marin County and Merchant Road (Golden Gate Bridge)	D	29	C	20	D	28
14	US 101 Northbound between Merchant Road and Marin County (Golden Gate Bridge)	D	29	E	42	C	20

- Notes: 1. Density measured in vehicle per mile per lane
2. Segments 5 through 8 were analyzed as Urban Arterial Segments only (see Exhibit 3-23)

Source: DKS Associates, 2004

Exhibit 3-23
Peak Hour Urban Street Segment Level of Service for Existing Condition

SEGMENT		URBAN STREET CLASS ²	AM		PM		WEEKEND	
			LOS	SPEED ¹	LOS	SPEED ¹	LOS	SPEED ¹
5	Richardson Southbound between proposed Marina Blvd access ramps and Lyon	III	C	19	B	26	B	26
6	Richardson Northbound between proposed Lyon and Marina Blvd access ramps	III	B	26	E	14	B	26
7	Marina Blvd Southbound between Lyon and Doyle Drive merger	III	B	26	B	27	B	27
8	Marina Blvd Northbound between Doyle Drive merger and Lyon	III	B	27	B	25	B	27

- Notes: 1. Speed calculated according to Highway Capacity Manual (HCM) methodology in miles per hour (mph). It is calculated as the average speed on the link. Delays at intersections are included in travel time analysis.
2. Urban Street Class III have a range of free flow speeds between 30 to 35 mph

Source: DKS Associates, 2004

Segment Weaving

Exhibit 3-24 presents the LOS for highway weaving sections. Deficient service levels shown at locations 1 and 2 are due to close spacing of the Merchant Road and Veterans Boulevard Ramps combined with high traffic volumes on the Golden Gate Bridge.

Exhibit 3-24
Weaving Segment Level of Service for Existing Condition

LOCATION		LEVEL OF SERVICE		
		AM	PM	WEEKEND
1	US 101 Southbound between the Merchant Road entrance ramp and Veterans Blvd exit ramp	C	C	E
2	US 101 Northbound between the Veterans Blvd entrance ramp and Merchant Road exit ramp	D	E	F
3	US 101 Southbound between the Veterans Blvd exit ramp and Richardson/Marina Access merge	C	A	C
4	US 101 Northbound between the Veterans Blvd exit ramp and Richardson/Marina Access merge	A	A	B

Note: Results interpolated from the Caltrans Design Manual Leisch method nomographs.

Source: DKS Associates, 2004

Temporary Impacts

This section identifies the potential impacts that may occur during construction of Alternatives 1 (No-Build), 2 (Replace and Widen), and 5 (Presidio Parkway). Following release of the *Draft Environmental Impact Statement/Report* (DEIS/R), the project team re-evaluated the transportation and transit analysis for the Preferred Alternative. A summary of this new analysis is also provided.

Projected construction staging is detailed in Chapter 2, Section 2.8 for Alternatives 2 and 5 and Section 2.9 for the Preferred Alternative.

The construction period for all build alternatives is approximately three to four years. During this length of time, a series of construction phases will occur and construction vehicles, equipment and workers will be traversing the project area. Temporary impacts will result from:

- Construction vehicles;
- Area-wide traffic reduction; and
- Ramp/road closures (greater than one month).

A discussion of these potential temporary impacts follows. General impacts are discussed first, followed by specific impacts related to each build alternative.

Construction Vehicles

Construction will involve demolition, excavation, and installation of new tunnel, bridge, and roadway structures; as well as landscaping and signing. Vehicles involved in construction will include trucks hauling debris and delivering construction materials and supplies, commuter vehicles driven by construction workers, and vehicles used for constructions such as graders and heavy earthmoving and paving equipment. Travel volume will vary depending on the specific construction activity and scheduling.

Construction traffic is expected to access the project site from Veterans Boulevard and the Golden Gate Bridge as was required during construction of the Letterman Digital Arts Complex. This traffic will enter the Presidio from southbound Richardson Avenue while exiting traffic will use Mason Street to northbound Doyle Drive. Depending on type of construction vehicle and time of arrival, vehicles may occasionally use the local streets within the Presidio. During final design, the Presidio Trust, the National Park Service, and the Golden Gate Bridge Highway and Transportation District, as well as other affected agencies will be consulted to define specific construction procedures, routes and implementation of the *Transportation Management Plan (TMP)* prepared for the Doyle Drive Project (see **Appendix K** for the Draft TMP)

Area-wide Traffic Reduction Strategies

Area roadways will continue to carry a high volume of traffic during construction. Although the roadways' current lanes will not be eliminated, some geometric restrictions (such as narrower lanes, alignment adjustments or more restrictive turning radii) and pavement conditions may create occasional awkward traffic movements or other situations where driver speeds will need to be reduced. Therefore, the TMP will include area-wide traffic reduction strategies aimed at reducing traffic in the construction area, and minimizing both Doyle Drive traffic and diversions to low-speed park roads during construction with detailed reduction needs and mitigation measures addressed during the specific traffic management situation. An over-arching strategy for construction zones begins with encouraging traffic to use alternate routes and reducing the area-wide traffic demand. In this situation, a reduction of five or ten percent in traffic could be achieved, and that would help to minimize additional traffic congestion.

Ramp/Road Closures and Operational Changes

During various construction stages, some ramps or roadways will be closed. Most closures are expected to last 4 to 24 months. In addition to closure, roadway lane capacity will be reduced in certain circumstances. The SF-TDM traffic model⁷ was used to assess the effects of such reductions. Using the travel model, a construction year (2010 as midpoint of construction) scenario was developed. Once completed, the effects from various closures were identified.

⁷ This study uses an enhanced version of the San Francisco Travel Demand model. The model used in this study was revalidated to local traffic counts for 2000.

Because each closure affects traffic in a different corridor differently during the day, each projected traffic condition was examined individually. A discussion of each of the major ramp/road closures is provided below.

Alternative 1: No-Build

The No-Build Alternative would have no temporary impacts on traffic because it represents the existing condition with no project-related activities.

Alternative 2: Replace and Widen

The existing adjacent sidewalk along the north side of Doyle Drive, which is difficult to use and ADA non-compliant, would be closed during construction. Existing trails that parallel Doyle Drive on both sides would accommodate pedestrians. These include portions of the Bay Trail, Presidio Promenade and the Golden Gate Promenade, as designated in the *Presidio Trails and Bikeways Master Plan*. Bicycles would be routed to designated bicycle paths and routes on either side of the project area on routes described in the *Presidio Trails and Bikeways Master Plan*.

Veterans Blvd/Doyle Drive Ramp Closures. For both the Detour and No-Detour Option, ramp closures are required in the initial stages of the project. The two ramps proposed for closure are those that connect Veterans Boulevard northbound to Doyle Drive southbound, and Doyle Drive northbound to Veterans Boulevard southbound. It is anticipated that this closure could last up to 18 months. While the Doyle Drive northbound to Veterans Boulevard southbound ramp may be closed for a longer duration, this particular situation represents the early critical “worst case” traffic diversion scenario.

The Veterans Boulevard northbound to Doyle Drive southbound ramp is projected to carry 930 vehicles in the AM peak hour and 730 vehicles in the PM peak hour. The Doyle Drive northbound to Veterans Boulevard southbound ramp is projected to carry 430 vehicles in the AM peak hour and 910 in the PM peak hour. Closure of these ramps would entail a shifting of the estimated 1,360 vehicles in the AM peak hour and 1,640 in the PM peak hour to other routes or times.

The SF-TDM model indicates that these ramp closures would result in traffic moving to other ramps and streets. The general impact of this closure is projected to be that most drivers (over 60 percent in each time period) would not use either Veterans Boulevard or Doyle Drive; these drivers would make their trips on other local streets through the Richmond District, Laurel Heights area, Presidio Heights area, the Cow Hollow District and the Marina District. These trips would generally disperse across the street network grid. The remaining forty percent (about 460 in the AM peak hour and 660 in the PM peak hour) would travel up Veterans Boulevard and cut through the Toll Plaza Visitor’s area to continue their trip. These trips would distribute evenly; half (or 20 percent overall) would cut underneath the Toll Plaza, and the other half would use Lincoln Boulevard to cross underneath Doyle Drive to cross between one side to

the other. This is forecasted to result in 350 AM peak hour vehicles and 100 PM peak hour vehicles traveling underneath the Toll Plaza in the peak direction, through this narrow roadway segment. Except for this localized increase in traffic in the Toll Plaza area, no other change in local Presidio traffic volumes is forecast to occur. Thus, other local roadways are not expected to have deterioration in traffic speeds, or resulting levels of service.

Lincoln Boulevard Closure. Local Presidio traffic would be rerouted for three months early in the construction period. During this time, Lincoln Boulevard near the National Cemetery and the northbound Veterans Boulevard ramp to southbound Doyle Drive would also be closed. Traffic would be diverted to Halleck Street, Mason Street and McDowell Avenue. The most critical time for this closure would be the PM, when 230 vehicles would be expected to use this diverted route northbound. Since traffic forecasts for detour roads show fewer than fifty vehicles at peak hours, the additional traffic would not result in any adverse congestion.

Marina/Richardson Merge and Diverge Relocation. Following completion of the construction scenarios, under the No-Detour Option, a westward relocation of the Marina Boulevard and Richardson Avenue merge (northbound) and diverge (southbound) points would be required. This would result in an AM volume reduction of eighty vehicles northbound and 340 vehicles southbound on Doyle Drive PM volumes would drop by 160 vehicles northbound and 250 vehicles southbound. These vehicles would relocate to a variety of other streets, with none experiencing a more than 100 vehicle increase. The analysis suggests that typical traffic reduction strategy measures would be sufficient to accommodate this shift.

Modified Marina Access. During the final construction stage of the No-Detour Option, the replacement of Marina Boulevard access would temporarily reroute traffic originating south of the facility. This traffic would cross the northbound Richardson Avenue roadway at an at-grade signalized intersection.

In the AM condition, the northbound Doyle Drive volumes would drop by 60 vehicles and the southbound by 220 vehicles. In the PM condition, the roadway is projected to have a drop of 160 vehicles in the northbound direction, and less than ten vehicles in the southbound direction. The traffic is anticipated to disperse to a variety of other streets, with no other street showing traffic changes of more than 100 vehicles in any direction.

The new intersection created in this situation should operate satisfactorily, assuming that three outbound lanes are available on Richardson Avenue through this intersection, and that two left-turn travel lanes are available for traffic wishing to travel to Marina Boulevard.

Assuming that all design constraints are met, no additional actions beyond the normal traffic reduction strategy for the project would be needed.

Alternative 5: Presidio Parkway

The existing adjacent sidewalk along the north side of Doyle Drive, which is difficult to use and ADA non-compliant, would be closed beginning at the commencement of construction. Existing trails that parallel Doyle Drive on both sides would accommodate pedestrians. These trails include portions of the Bay Trail, Presidio Promenade and the Golden Gate Promenade, as designated in the *Presidio Trails and Bikeways Master Plan*.

Bicycles would be routed to already-designated bicycle paths and routes on either side of the project area on routes described in the *Presidio Trails and Bikeways Master Plan*.

Lincoln Boulevard Closure. Early in the construction phase, one traffic detour would involve rerouting internal Presidio traffic. A three-month closure of Lincoln Boulevard near the National Cemetery is proposed during the initial stages of construction. During this time, local traffic would be diverted to Halleck Street, Mason Street and McDowell Avenue, and pedestrians and bicyclists would need to follow these parallel routes. (Note: Halleck Street would be required to be opened when Lincoln Boulevard would be closed.) The most critical time period for this closure would be the PM, when 290 vehicles would be expected to use this diverted route northbound. As the detour roads have fewer than 50 vehicles forecast on them at peak hour, the additional traffic should not result in any adverse congestion.

Halleck Street Closure. During construction, another traffic detour would be required when Halleck Street is closed for about a three year period. Halleck Street would attract less than 100 vehicles in each direction at peak hour, so that congestion impacts are not anticipated. Bicycle and pedestrian users would be affected, as the nearest detours would be at least 500 meters to the east (Lyon Street) or 1,000 meters to the west (McDowell Avenue). To assure access between these areas, bicycles and pedestrians would be directed to paths and routes on either side of the project area as designated and described in the *Presidio Trails and Bikeways Master Plan*.

Marina Boulevard Access without Doyle Drive to Veterans Boulevard Ramp Closure. For the Parkway Alternative, the “worst case” scenario is the point in the construction staging where traffic to and from Marina Boulevard on the Girard Road extension would need to cross the temporary northbound Richardson Avenue ramp. Although traffic flow varies between the Diamond and the Circle Drive Options, there is no appreciable difference for purposes of this analysis.

In this scenario, the outbound traffic on Richardson was tested at two lanes. With two lanes, outbound Doyle Drive operated adequately in the AM peak hour, with less than 100 vehicles change on Doyle Drive. However, in the PM condition, the lack of three through lanes posed a substantial barrier to traffic. Over 1,000 vehicles shifted to other streets. About 250 vehicles would shift to Lincoln, another 250 vehicles would use Veterans Boulevard to reach the bridge,

and another 300 vehicles would choose other routes instead of using the Doyle Drive northbound to Veterans Boulevard ramp.

For this reason, a full three lanes would be needed to carry the volumes coming from Richardson Avenue. With three lanes, the signalized intersection created in this situation should operate satisfactorily and traffic diversion would not occur. Two lanes would be available on Girard Road for southbound Doyle Drive traffic wishing to travel to Marina Boulevard.

No substantial congestion is anticipated on roadways within the Presidio during this phase. All local roadways are forecast to have stable or slightly lower traffic volumes, even with the closure of Halleck Street. Once the extension of Girard Road to Marina Boulevard is opened, it would experience increased traffic, but this is expected as part of implementing Alternative 5.

These strategies would be investigated as part of the TMP, and interactive traffic management, as appropriate, would be implemented to alleviate this upcoming bottleneck.

Marina Boulevard Access with Doyle Drive to Veterans Boulevard Ramp Closure. One possible variation of the previously-mentioned phase is for the Doyle Drive northbound to Veterans Boulevard southbound ramp to remain closed, rather than to have a temporary ramp for a portion of the construction period. In the case where this ramp is kept closed during construction, the traffic would divert to the Toll Plaza routing as discussed above in Alternative 2. The remaining vehicles would disperse to other local streets.

Similar to the previously-mentioned phase, a full three lanes would be needed to carry the anticipated volumes coming from Richardson Avenue. With three lanes, the signalized intersection created in this situation should operate satisfactorily and traffic diversion would not occur. Two lanes would be available on Girard Road for southbound Doyle Drive traffic wishing to travel to Marina Boulevard.

No substantial congestion is anticipated on roadways within the Presidio during this phase. Generally, all of these local roadways are forecast to have stable or slightly lower traffic volumes, even with the closure of Halleck Street. Once the extension of Girard Road to Marina Boulevard is opened, it would experience increased traffic, but this is expected as part of implementing Alternative 5.

These strategies would be investigated as part of the TMP, and interactive traffic management, as appropriate, would be implemented.

Preferred Alternative

The existing adjacent sidewalk along the north side of Doyle Drive, which is difficult to use and ADA non-compliant, will be closed during construction. Existing trails that parallel Doyle Drive on both sides will accommodate pedestrians. These include portions of the Bay Trail, Presidio Promenade and the Golden Gate Promenade, as designated in the *Presidio Trails and Bikeways*

Master Plan. Bicycles will be routed to designated bicycle paths and routes on either side of the project area on routes described in the *Presidio Trails and Bikeways Master Plan*.

Doyle Drive Closures. During construction, Doyle Drive traffic in the vicinity of the low-viaduct will be diverted to the north of the existing facility by using an at-grade roadway. A crossover will be built in the vicinity of the Sports Basement retail location (Building 610) and will connect the detour to the partially completed southbound Doyle Drive alignment. The construction sequence will require two complete weekend closures of Doyle Drive. The first closure, marking the end of Stage One of construction, will be required to build the crossover that will be used in Stage Two. The second closure, occurring at the end of the second stage of construction, will be required to demolish the crossover and switch traffic onto the new Doyle Drive alignment. The proposed temporary roadway will accommodate a total of five lanes of traffic, with a moveable barrier separating northbound and southbound Doyle Drive to accommodate peak direction traffic in the morning and in the afternoon.

Veterans Boulevard/Doyle Drive Ramp Closures. The two ramps proposed for closure are those that connect Veterans Boulevard northbound to Doyle Drive southbound, and Doyle Drive northbound to Veterans Boulevard southbound. It is anticipated that the closure of Veterans Boulevard northbound to Doyle Drive southbound will be between 6 to 12 months and Doyle Drive northbound to Veterans Boulevard southbound ramp may be closed for 18 months, this particular situation represents the early critical “worst case” traffic diversion scenario.

The Veterans Boulevard northbound to Doyle Drive southbound ramp is projected to carry 930 vehicles in the AM peak hour and 730 vehicles in the PM peak hour. The Doyle Drive northbound to Veterans Boulevard southbound ramp is projected to carry 430 vehicles in the AM peak hour and 910 in the PM peak hour. Closure of these ramps will entail a shifting of the estimated 1,360 vehicles in the AM peak hour and 1,640 in the PM peak hour to other routes or times.

The SF-TDM model indicates that these ramp closures will result in traffic moving to other ramps and streets. The general impact of this closure is projected to be that most drivers (over 60 percent in each time period) will not use either Veterans Boulevard or Doyle Drive; these drivers will make their trips on other local streets through the Richmond District, Laurel Heights area, Presidio Heights area, the Cow Hollow District and the Marina District. These trips will generally disperse across the street network grid. The remaining 40 percent (up to 370 in the PM peak hour) will travel up Veterans Boulevard and cut through the Toll Plaza Visitor’s area to continue their trip. These trips would distribute evenly; half (or 20 percent overall) will cut underneath the Toll Plaza, and the other half will use Lincoln Boulevard to cross underneath Doyle Drive to cross between one side to the other. This is forecasted to result in up to 175 PM peak hour vehicles traveling underneath the Toll Plaza, through this narrow

roadway segment. Except for this localized increase in traffic in the Toll Plaza area, no other change in local Presidio traffic volumes is forecast to occur. Thus, other local roadways are not expected to have deterioration in traffic speeds, or resulting levels of service.

Lincoln Boulevard Closure. Early in the construction phase, one traffic detour will involve rerouting internal Presidio traffic. A three-month closure of Lincoln Boulevard near the National Cemetery is proposed during the initial stages of construction. During this time, local traffic will be diverted to Halleck Street, Mason Street and McDowell Avenue, and pedestrians and bicyclists will need to follow these parallel routes. (Note: Halleck Street will be required to be opened when Lincoln Boulevard will be closed.) The most critical time period for this closure will be the PM, when 290 vehicles will be expected to use this diverted route northbound. As the detour roads have fewer than 50 vehicles forecast on them at peak hour, the additional traffic should not result in any adverse congestion.

Halleck Street Closure. During construction, another traffic detour will be required when Halleck Street is closed for about 24 months. Halleck Street will attract less than 100 vehicles in each direction at peak hour, so that congestion impacts are not anticipated. Bicycle and pedestrian users will be affected, as the nearest detours will be at least 500 meters (1,640 feet) to the east (Lyon Street) or 1,000 meters (3,280 feet) to the west (McDowell Avenue). To assure access between these areas, a replacement path should be provided across the roadway whenever possible.

Modified Marina Access. The diversion of traffic onto the temporary at-grade roadway will require a modified Marina access. Traffic will cross the northbound Richardson Avenue roadway at an at-grade signalized intersection.

In the AM condition, the northbound Doyle Drive volumes will drop by 60 vehicles and the southbound by 220 vehicles. In the PM condition, the roadway is projected to have a drop of 160 vehicles in the northbound direction, and less than ten vehicles in the southbound direction. The traffic is anticipated to disperse to a variety of other streets, with no other street showing traffic changes of more than 100 vehicles in any direction.

The new intersection created in this situation should operate satisfactorily, assuming that three outbound lanes are available on Richardson Avenue through this intersection, and that two left-turn travel lanes are available for traffic wishing to travel to Marina Boulevard.

These strategies will be investigated as part of the TMP, and interactive traffic management, as appropriate, will be implemented.

Summary of Temporary Impacts by Alternative

Alternative 1: No-Build

No adverse impacts.

Alternative 2: Replace and Widen

Construction vehicles would access the project site from Veterans Boulevard and the Golden Gate Bridge.

Additional congestion associated with occasional construction period roadway configuration changes would occur, which would be addressed through a TMP.

Local vehicular, pedestrian and bicycle traffic would need to be rerouted during the period where there is a Lincoln Boulevard closure for approximately three months.

The overall construction duration for the Replace and Widen – No-Detour Option would be three years and four months while the With Detour Option would be four years and three months.

Alternative 5: Presidio Parkway

Construction vehicles would access the project site from Veterans Boulevard and the Golden Gate Bridge.

Additional congestion associated with occasional construction period roadway configuration changes would occur, which would be addressed through a TMP.

Local vehicular, pedestrian and bicycle traffic would need to be rerouted during the period where there is a Lincoln Boulevard closure for approximately three months.

Local vehicular, pedestrian and bicycle traffic would need to be rerouted during the period where there is a Halleck Street closure for approximately three years.

The overall construction duration for the Presidio Parkway Alternative is four years and seven months.

Preferred Alternative

Construction vehicles will access the project site from Veterans Boulevard and the Golden Gate Bridge.

Additional congestion associated with occasional construction period roadway configuration changes will occur, which would be addressed through a TMP.

Doyle Drive through traffic will need to be rerouted during the complete closures of the mainline facility which will occur on two weekends.

Local vehicular, pedestrian and bicycle traffic will need to be rerouted during the period where there is a Lincoln Boulevard closure for approximately three months.

Local vehicular, pedestrian and bicycle traffic will need to be rerouted during the period where there is a Halleck Street closure for approximately two years.

The overall construction duration for the Presidio Parkway Alternative is three years and six months.

Permanent Impacts

In the analysis of the permanent impacts, the alternatives are compared to the No-Build Alternative in the design year. The following section presents the key traffic and transportation elements and provides a summary of potential permanent impacts and corrective measures for each alternative.

Intersection Level of Service. By the design year, the No-Build Alternative and Alternative 5, Presidio Parkway Alternative would have a new signalized intersection on Richardson Avenue at Gorgas Avenue/Lyon Street. New signals would also be installed at Lincoln Boulevard and Merchant Road, Lyon and Lombard Streets and Presidio and Pacific Streets, as agreed in the PTMP. Timing plans for new signals were developed in accordance with existing signal timing progression used for downstream/upstream signals, and for fixed signal timing plans that would provide enough time for pedestrians to cross streets. Fixed signal timing plans for new signals on other roadways were optimized to provide the least amount of intersection delay. The AM intersection LOS are shown in **Exhibit 3-25** (on the following pages) and the PM intersection LOS in **Exhibit 3-26** (on the following pages). **Exhibit 3-27** (on the following pages) contains the weekend condition.

Exhibit 3-25
AM Peak Hour Intersection Level of Service Results By Alternative

INTERSECTION		CRITERIA	BASE YEAR	DESIGN YEAR				
#	NORTH/SOUTH			EAST/WEST	NO-BUILD	REPLACE AND WIDEN	PARKWAY: DIAMOND OPTION	PARKWAY: CIRCLE DRIVE OPTION
SIGNALIZED INTERSECTIONS								
1	Lyon	Marina	Delay ¹ LOS	13 B	10 A	10 A	15 B	15 B
2	101 / Richardson	Francisco	Delay LOS	34 C	35 C	35 C	38 D	39 D
4	Lincoln (S)	Merchant	Delay LOS	Stop Controlled	15 B	15 B	14 B	14 B
7	Richardson / 101	Gorgas / Lyon	Delay LOS	- -	17 B	16 B	16 B	16 B
8	Marina / Girard	Gorgas / 101 SB Ramps	Delay LOS	- -	- -	- -	14 B	10 A
9	Marina / Girard	101 NB Ramps	Delay LOS	- -	- -	- -	9 A	11 B
12	101 / Richardson	Chestnut	Delay LOS	12 B	14 B	14 B	14 B	14 B
13	101 / Richardson	Lombard	Delay LOS	10 ² B	9 ² A	9 ² A	3 A	3 A
14	101 / Lombard	Broderick	Delay LOS	21 C	21 C	21 C	13 B	13 B
15	Lyon	Lombard Gate	Delay LOS	Stop Controlled	26 C	27 C	18 B	16 B
16	Presidio	Pacific	Delay LOS	Stop Controlled	15 B	16 B	13 B	13 B
17	Veterans	Lake	Delay LOS	17 B	24 C	24 C	24 C	25 C
STOP CONTROLLED INTERSECTIONS³								
3	Lincoln (N)	GGB Viewing Area	Delay	13 ⁴	22	25	20	19
			LOS	B	C	C	C	C
4	Lincoln (S)	Merchant	Delay LOS	10 A	To be signalized in the future			
5	Girard	Lincoln	Delay LOS	<1 A ⁴	11 B ⁴	11 B ⁴	16 C	14 B
6	Halleck	Mason	Delay LOS	6 A	7 A	7 A	7 A	7 A

Exhibit 3-25 -- Continued
AM Peak Hour Intersection Level of Service Results by Alternative

INTERSECTION			CRITERIA	BASE YEAR	DESIGN YEAR			
#	NORTH/SOUTH	EAST/WEST			NO-BUILD	REPLACE AND WIDEN	PARKWAY: DIAMOND OPTION	PARKWAY: CIRCLE DRIVE OPTION
10	Broderick	Marina	Delay LOS	59 F	100 F	>100 F	35 E	33 D
11	Divisadero	Marina	Delay LOS	79 F	>100 F	>100 F	36 E	32 D
15	Lyon	Lombard Gate	Delay LOS	29 D	To be signalized in the future			
16	Presidio	Pacific	Delay LOS	16 C	To be signalized in the future			
18 ⁵	Merchant	GGB Viewing Area	Delay LOS	9 A	12 B	8 A	11 B	11 B

- Notes*
1. Delay is measured in seconds per vehicle
 2. The intersection proximity between #13 Lombard and Richardson, and #14 Lombard and Broderick, results in spillback for left-turning vehicles at Lombard and Richardson, resulting in additional delay not demonstrated in this intersection level of service analysis.
 3. All stop controlled intersections have all way stop controlled approaches except as noted.
 4. For two-way stop controlled intersections, the delay and LOS for the worst movement is given.
 5. The intersection of Merchant Road and GGB Viewing Area has a free northbound left turn and a free eastbound right turn. The delay has been calculated based on an all-way stop.

Source: DKS Associates, 2004

Exhibit 3-26
PM Peak Hour Intersection Level of Service Results by Alternative

INTERSECTION			CRITERIA	BASE YEAR	DESIGN YEAR			
#	NORTH/SOUTH	EAST/WEST			NO-BUILD	REPLACE AND WIDEN	PARKWAY: DIAMOND OPTION	PARKWAY: CIRCLE DRIVE OPTION
SIGNALIZED INTERSECTIONS								
1	Lyon	Marina	Delay ¹ LOS	18 B	9 A	25 C	14 B	14 B
2	Richardson	Francisco	Delay LOS	10 B	14 B	15 B	21 C	22 C
4	Lincoln (S)	Merchant	Delay LOS	Stop Controlled	17 B	18 B	15 B	16 B
7	Richardson / 101	Gorgas / Lyon	Delay LOS	- -	17 B	17 B	25 C	20 C
8	Marina / Girard	Gorgas / 101 SB Ramps	Delay LOS	- -	- -	- -	14 B	10 B

Exhibit 3-26 -- Continued
PM Peak Hour Intersection Level of Service Results by Alternative

INTERSECTION			CRITERIA	BASE YEAR	DESIGN YEAR			
#	NORTH/SOUTH	EAST/WEST			NO-BUILD	REPLACE AND WIDEN	PARKWAY: DIAMOND OPTION	PARKWAY: CIRCLE DRIVE OPTION
SIGNALIZED INTERSECTIONS								
9	Marina / Girard	101 NB Ramps	Delay LOS	- -	- -	- -	6 A	8 A
12	Richardson	Chestnut	Delay LOS	15 B	17 B	16 B	17 B	16 B
13	Richardson	Lombard	Delay LOS	5 ² A	7 ² A	7 ² A	3 A	3 A
14	101 / Lombard	Broderick	Delay LOS	25 C	22 C	21 C	24 C	22 C
15	Lyon	Lombard Gate	Delay LOS	Stop Controlled	20 D	20 C	17 B	17 B
16	Presidio	Pacific	Delay LOS	Stop Controlled	16 B	17 B	14 B	14 B
17	Veterans	Lake	Delay LOS	21 C	38 D	41 D	40 D	39 D
STOP CONTROLLED INTERSECTIONS³								
3	Lincoln (N)	GGB Viewing Area	Delay LOS	12 ⁴ B	12 B	13 B	12 B	12 B
4	Lincoln (S)	Merchant	Delay LOS	11 B	To be signalized in the future			
5	Girard	Lincoln	Delay LOS	<1 ⁴ A	13 ⁴ B	13 ⁴ B	20 C	18 C
6	Halleck	Mason	Delay LOS	6 A	7 A	6 A	6 A	6 A
10	Broderick	Marina	Delay LOS	166 F	>100 F	>100 F	>100 F	>100 F
11	Divisadero	Marina	Delay LOS	182 F	>100 F	>100 F	>100 F	>100 F
15	Lyon	Lombard Gate	Delay LOS	18 C	To be signalized in the future			
16	Presidio	Pacific	Delay LOS	19 C	To be signalized in the future			
18 ⁵	Merchant	GGB Viewing Area	Delay LOS	13 B	11 B	11 B	10 B	10 B

- Notes
1. Delay is measured in seconds per vehicle
 2. The intersection proximity between #13 Lombard and Richardson, and #14 Lombard and Broderick, results in spillback for left-turning vehicles at Lombard and Richardson, resulting in additional delay not demonstrated in this intersection level of service analysis.
 3. All stop controlled intersections have all way stop controlled approaches except as noted.
 4. For two-way stop controlled intersections, the delay and LOS for the worst movement is given.
 5. Intersection of Merchant Road/GGB Viewing Area has a free northbound left turn/eastbound right turn. Delay was calculated based on all-way stop.

Exhibit 3-27
Weekend Peak Hour Intersection Level of Service Results by Alternative

INTERSECTION			CRITERIA	BASE YEAR	DESIGN YEAR			
#	NORTH/SOUTH	EAST/WEST			NO-BUILD	REPLACE AND WIDEN	PARKWAY: DIAMOND OPTION	PARKWAY: CIRCLE DRIVE OPTION
SIGNALIZED INTERSECTIONS								
1	Lyon	Marina	Delay ¹ LOS	20 B	8 A	8 A	11 B	11 B
2	Richardson	Francisco	Delay LOS	11 B	14 B	14 B	16 B	16 B
4	Lincoln (S)	Merchant	Delay LOS	Stop Controlled	13 B	13 B	13 B	13 B
7	Richardson / 101	Gorgas / Lyon	Delay LOS	- -	14 B	14 B	14 B	14 B
8	Marina / Girard	Gorgas / 101 SB Ramps	Delay LOS	- -	- -	- -	12 B	10 A
9	Marina / Girard	101 NB Ramps	Delay LOS	- -	- -	- -	8 A	5 A
12	Richardson	Chestnut	Delay LOS	12 B	14 B	14 B	12 B	11 B
13	Richardson	Lombard	Delay LOS	7 ² A	6 ² A	7 ² A	2 A	2 A
14	101 / Lombard	Broderick	Delay LOS	18 B	19 B	19 B	12 B	11 B
15	Lyon	Lombard Gate	Delay LOS	Stop Controlled	32 C	37 D	15 B	15 B
16	Presidio	Pacific	Delay LOS	Stop Controlled	14 B	14 B	12 B	13 B
17	Veterans	Lake	Delay LOS	15 B	17 B	17 B	15 B	16 B
STOP CONTROLLED INTERSECTIONS³								
3	Lincoln (N)	GGB Viewing Area	Delay	8 ⁴	8	7	8	8
			LOS	A	A	A	A	A
4	Lincoln (S)	Merchant	Delay	11	To be signalized in the future			
			LOS	B				
5	Girard	Lincoln	Delay	<1 ⁴	9 ⁴	9 ⁴	15	15
			LOS	A	A	A	B	B
6	Halleck	Mason	Delay	6	6	6	6	6
			LOS	A	A	A	A	A
10	Broderick	Marina	Delay	46	>100	>100	14	13
			LOS	E	F	F	B	B

Exhibit 3-27 -- Continued
Weekend Peak Hour Intersection Level of Service Results by Alternative

#	INTERSECTION		CRITERIA	BASE YEAR	DESIGN YEAR			
	NORTH/SOUTH	EAST/WEST			NO-BUILD	REPLACE AND WIDEN	PARKWAY DIAMOND OPTION	PARKWAY CIRCLE DRIVE OPTION
11	Divisadero	Marina	Delay	68	>100	>100	14	13
			LOS	F	F	F	B	B
15	Lyon	Lombard Gate	Delay	12	To be signalized in the future			
			LOS	B				
16	Presidio	Pacific	Delay	19	To be signalized in the future			
			LOS	C				
18 ^s	Merchant	GGB Viewing Area	Delay	12	10	10	10	10
			LOS	B	A	A	B	A

- Notes
1. Delay is measured in seconds per vehicle
 2. The intersection proximity between #13 Lombard and Richardson, and #14 Lombard and Broderick, results in spillback for left-turning vehicles at Lombard and Richardson, resulting in additional delay not demonstrated in this intersection level of service analysis.
 3. All stop controlled intersections have all way stop controlled approaches except as noted.
 4. For two-way stop controlled intersections, the delay and LOS for the worst movement is given.
 5. The intersection of Merchant Road and GGB Viewing Area has a free northbound left turn and a free eastbound right turn. The delay has been calculated based on an all-way stop.

Source: DKS Associates, 2004

The analysis shows that the intersections in the study area would continue to operate with acceptable level of service for all alternatives except the two unsignalized intersections along Marina Boulevard (Marina Boulevard at Divisadero Street and Marina Boulevard at Broderick Street). Both of these intersections operate at LOS F during the existing conditions with extensive delays. With the exception of the Presidio Parkway Alternative during the AM and weekend peak periods, these intersections would continue to experience extensive delays. It should be noted that the delay for the Presidio Parkway Alternative is much less than the delay under existing conditions and very similar to the forecast delay that would occur under the No-Build Alternative. Thus, the build alternatives would not create an adverse impact at these locations.

Segment Level of Service. The segment LOS was based on the density of vehicles and/or average travel speed, depending on whether it was a highway or urban street segment. The segment LOS results are provided for highway segments in **Exhibit 3-28** (on the following pages) for AM conditions, **Exhibit 3-29** (on the following pages) for PM conditions and **Exhibit 3-30** (on the following pages) for weekend conditions. Urban street levels of service are shown in **Exhibit 3-31** (on the following pages) for AM conditions, **Exhibit 3-32** (on the following pages) for PM conditions and **Exhibit 3-33** (on the following pages) for weekend conditions. Some transitional segments are listed in both tables for informational purposes. Operational studies have shown that traffic on the Golden Gate Bridge (Segments 13 and 14) in **Exhibits 3-28** through **3-30** and

the northbound approach link to the Golden Gate Bridge (Segment 2) in **Exhibits 3-28** through **3-30** would operate at a deficient level of service during the AM peak hour, unless the bridge lanes are operated with three lanes in each direction. This would result in a LOS F for southbound Golden Gate Bridge traffic (Segment 13) in the AM peak hour, although operational studies project that this would result in much less congestion than if the four lane southbound/two lane northbound configuration were used in the design year. These exhibits show a large increase in traffic projected by 2030, as a result of increased traffic demand expected to occur in the non-peak direction (northbound for the AM and southbound for the PM peak hours).

Exhibit 3-28
Highway Segment Level of Service -- AM Peak Hour

No.	LOCATION	DIR	CRITERIA	Base Year	DESIGN YEAR			
					No-BUILD	REPLACE AND WIDEN	PARKWAY DIAMOND OPTION	PARKWAY CIRCLE OPTION
1	US 101 from the Merchant Drive Ramps to Veterans Blvd	SB	Hour Volume	6150	6441	6414	6550	6556
			Density / LOS	31 / D	33 / D	33 / D	33 / D	34 / D
2	US 101 from Veterans Blvd to the Merchant Drive Ramps	NB	Hour Volume	2994	5019	5013	5091	5096
			Density / LOS	20 / C	25 / C ¹	25 / C ¹	26 / C ¹	26 / C ¹
3	US 101 from Veterans to the Marina Blvd Access Ramps	SB	Hour Volume	5203	4981	4996	4951	4888
			Density / LOS	26 / D ⁵	25 / C	25 / C	25 / C	24 / C
4	US 101 from the Marina Blvd Access Ramps to Veterans Blvd	NB	Hour Volume	2049	2947	2979	2994	2948
			Density / LOS	14 / B	20 / C	20 / C	20 / C	20 / C
5	Richardson from the Marina Blvd Access Ramps to north of Lyon St	SB	Hour Volume	3717	3325	3320	3053	3063
			Density / LOS	39 / E	34 / D	34 / D	31 / D	31 / D
6	Richardson from North of Lyon St to the Marina Blvd Access Ramps	NB	Hour Volume	1443	2141	2208	2743	2636
			Density / LOS	14 / B	21 / C	22 / C	27 / D	26 / D ⁵
7	Marina Blvd from the Doyle Drive Merge to Lyon St	EB	Hour Volume	1486	1656	1676	N/A ⁴	N/A ⁴
			Density / LOS	21 / C	24 / C	24 / C	N/A ⁴	N/A ⁴
8	Marina Blvd from Lyon St to the Doyle Drive merge	WB	Hour Volume	606	806	770	N/A ⁴	N/A ⁴
			Density / LOS	9 / A	12 / B	11 / A	N/A ⁴	N/A ⁴
9	Veterans Blvd from US 101 Ramps to Veterans Blvd Tunnel	SB	Hour Volume	2380	2480	2485	2576	2592
			Density / LOS	24 / C	25 / C	25 / C	26 / C	26 / C
10	Veterans Blvd from Veterans Blvd Tunnel to the US 101 Ramps	NB	Hour Volume	2379	3092	3101	3073	3072
			Density / LOS	24 / C	31 / D	31 / D	31 / D	31 / D
11	US 101 between Veterans Blvd on and off-ramps	SB	Hour Volume	4217	4345	4314	4328	4295
			Density / LOS	28 / D	29 / D	29 / D	29 / D	29 / D
12	US 101 between Veterans Blvd off and on-ramps	NB	Hour Volume	1601	2564	2593	2641	2617
			Density / LOS	11 / A	17 / B	17 / B	18 / B	17 / B
13	US 101 between Marin County and Merchant Rd (Golden Gate Bridge)	SB	Hour Volume	5780	6098	6102	6105	6123
			Density / LOS	29 / D	44 / F ²	44 / F ²	44 / F ²	44 / F ²
14	US 101 between Merchant Rd and Marin County (Golden Gate Bridge)	NB	Hour Volume	2862	4990	4990	4991	4989
			Density / LOS	29 / D	34 / D ³	34 / D ³	34 / D ³	34 / D ³

Notes: 1. If Golden Gate Bridge northbound configuration remains at the current two lanes, this segment would operate at D for all future design year scenarios.
2. If Golden Gate Bridge southbound configuration remains at the current four lanes, this segment would operate at D for all future design year scenarios. However, the analysis also shows that queuing would be extensive on Doyle Drive if this configuration is used, and that queuing on the bridge would be minimal in this configuration.
3. If Golden Gate Bridge northbound configuration remains at the current two lanes, this segment would operate at F for all future design year scenarios.
4. This segment is analyzed as an Urban Street Segment under the two Presidio Parkway Alternative options.
5. Reported Level of Service for this segment is one classification greater than Thresholds identified in Exhibit 3-11 as density measurement is slightly above the rounded threshold.

Source: DKS Associates, 2004

Exhibit 3-29
Highway Segment Level of Service -- PM Peak Hour

No.	LOCATION	DIR	CRITERIA	BASE YEAR	DESIGN YEAR			
					NO-BUILD	REPLACE AND WIDEN	PARKWAY DIAMOND OPTION	PARKWAY CIRCLE OPTION
1	US 101 from the Merchant Drive Ramps to Veterans Blvd	SB	Hour Volume	3120	5074	5437	5612	5572
			Density / LOS	21 / C	25 / C	27 / D	28 / D	28 / D
2	US 101 from Veterans Blvd to the Merchant Drive Ramps	NB	Hour Volume	5649	6219	6263	6448	6431
			Density / LOS	28 / D	32 / D	32 / D	33 / D	33 / D
3	US 101 from Veterans to the Marina Blvd Access Ramps	SB	Hour Volume	2608	3590	3838	3785	3752
			Density / LOS	26 / D ³	18 / B	19 / C	19 / C	19 / C
4	US 101 from the Marina Blvd Access Ramps to Veterans Blvd	NB	Hour Volume	4619	4806	4795	4924	4902
			Density / LOS	31 / D	33 / D	33 / D	34 / D	33 / D
5	Richardson from Marina Blvd Access Ramps to north Lyon St	SB	Hour Volume	1734	2543	2660	2398	2431
			Density / LOS	17 / B	25 / C	27 / D	24 / C	24 / C
6	Richardson from North of Lyon St to Marina Blvd Access Ramps	NB	Hour Volume	2802	2931	3008	3355	3291
			Density / LOS	28 / D	29 / D	30 / D	34 / D	34 / D
7	Marina Blvd from the Doyle Drive Merge to Lyon St	EB	Hour Volume	873	1047	1178	N/A ²	N/A ²
			Density / LOS	13 / B	15 / B	17 / B	N/A ²	N/A ²
8	Marina Blvd from Lyon St to the Doyle Drive merge	WB	Hour Volume	1817	1875	1787	N/A ²	N/A ²
			Density / LOS	26 / C	27 / D	26 / C	N/A ²	N/A ²
9	Veterans Blvd from US 101 Ramps to Veterans Blvd Tunnel	SB	Hour Volume	2251	2935	2984	3094	3080
			Density / LOS	23 / C	30 / D	30 / D	31 / D	31 / D
10	Veterans Blvd from Veterans Blvd Tunnel to US 101 Ramps	NB	Hour Volume	2768	2864	2853	2792	2790
			Density / LOS	28 / D	29 / D	29 / D	28 / D	28 / D
11	US 101 between Veterans Blvd on and off-ramps	SB	Hour Volume	1884	2929	3180	3190	3163
			Density / LOS	13 / B	20 / C	21 / C	21 / C	21 / C
12	US 101 between Veterans Blvd off and on-ramps	NB	Hour Volume	3605	4016	4068	4252	4230
			Density / LOS	24 / C	27 / D	27 / D	28 / D	28 / D
13	US 101 between Marin County and Merchant Rd (Golden Gate Bridge)	SB	Hour Volume	2987	5275	5732	5734	5723
			Density / LOS	20 / C	37 / E ¹	41 / E ¹	41 / E ¹	40 / E ¹
14	US 101 between Merchant Road and Marin County (Golden Gate Bridge)	NB	Hour Volume	5890	6450	6491	6500	6492
			Density / LOS	42 / E	47 / F ¹	48 / F ¹	48 / F ¹	48 / F ¹

Notes: 1. Golden Gate Bridge segments are projected to operate at a deficient level of service in all scenarios in the design year in both directions.
2. This segment is analyzed as an Urban Street Segment under the two Presidio Parkway Alternative options.
3. Reported Level of Service for this segment is one classification greater than Thresholds identified in Exhibit 3-11 as density measurement is slightly above the rounded threshold.

Source: DKS Associates, 2004

**Exhibit 3-30
Highway Segment Level of Service -- Weekend Peak Hour**

No.	LOCATION	DIR	CRITERIA	BASE YEAR	DESIGN YEAR			
					NO-BUILD	REPLACE AND WIDEN	PARKWAY DIAMOND OPTION	PARKWAY CIRCLE OPTION
1	US 101 from the Merchant Drive Ramps to Veterans Blvd	SB	Hour Volume	4583	5430	5446	5471	5466
			Density / LOS	23 / C	27 / D	27 / D	27 / D	27 / D
2	US 101 from Veterans Blvd to the Merchant Drive Ramps	NB	Hour Volume	3377	5277	5271	5304	5299
			Density / LOS	23 / C	26 / D ³	26 / D ³	27 / D	27 / D
3	US 101 from Veterans Blvd to the Marina Blvd Access Ramps	SB	Hour Volume	3596	3493	3501	3397	3389
			Density / LOS	24 / C	18 / B	18 / B	17 / B	17 / B
4	US 101 from the Marina Blvd Access Ramps to Veterans Blvd	NB	Hour Volume	2624	3550	3533	3633	3612
			Density / LOS	18 / B	24 / C	24 / C	24 / C	24 / C
5	Richardson from the Marina Blvd Access Ramps to north of Lyon St	SB	Hour Volume	2520	2532	2516	2272	2306
			Density / LOS	25 / C	25 / C	25 / C	23 / C	23 / C
6	Richardson from north of Lyon St to the Marina Blvd Access Ramps	NB	Hour Volume	1683	2407	2455	2960	2907
			Density / LOS	17 / B	24 / C	25 / C	30 / D	29 / D
7	Marina Blvd from the Doyle Drive Merge to Lyon St	EB	Hour Volume	1076	960	986	N/A ²	N/A ²
			Density / LOS	15 / B	14 / B	14 / B	N/A ²	N/A ²
8	Marina Blvd from Lyon St to the Doyle Drive merge	WB	Hour Volume	941	1142	1078	N/A ²	N/A ²
			Density / LOS	13 / B	16 / B	15 / B	N/A ²	N/A ²
9	Veterans Blvd from the US 101 Ramps to the Veterans Blvd Tunnel	SB	Hour Volume	2213	2165	2182	2278	2283
			Density / LOS	22 / C	22 / C	22 / C	23 / C	23 / C
10	Veterans Blvd from Veterans Blvd Tunnel to the US 101 Ramps	NB	Hour Volume	1980	1955	1975	1875	1892
			Density / LOS	20 / C	20 / C	20 / C	19 / C	19 / C
11	US 101 between Veterans Blvd on and off-ramps	SB	Hour Volume	2892	3376	3376	3292	3285
			Density / LOS	19 / C	23 / C	23 / C	22 / C	22 / C
12	US 101 between Veterans Blvd off and on-ramps	NB	Hour Volume	2102	3439	3421	3535	3510
			Density / LOS	14 / B	23 / C	23 / C	24 / C	23 / C
13	US 101 between Marin County and Merchant Rd (Golden Gate Bridge)	SB	Hour Volume	4153	5556	5559	5561	5560
			Density / LOS	28 / D	39 / E ¹	39 / E ¹	39 / E ¹	39 / E ¹
14	US 101 between Merchant Rd and Marin County (Golden Gate Bridge)	NB	Hour Volume	3000	5226	5219	5230	5226
			Density / LOS	20 / C	36 / E ¹	36 / E ¹	36 / E ¹	36 / E ¹

Notes: 1. Golden Gate Bridge segments are projected to operate at a deficient level of service in all scenarios in the design year in both directions.
2. This segment is analyzed as an Urban Street Segment under the two Presidio Parkway Alternative options.
3. Reported Level of Service for this segment is one classification greater than Thresholds identified in Exhibit 3-11 as density measurement is slightly above the rounded threshold.

Source: DKS Associates, 2004

Exhibit 3-31
Urban Street Segment Level of Service -- AM Peak Hour

No.	LOCATION	DIR	CRITERIA	BASE YEAR	DESIGN YEAR			
					NO-BUILD	REPLACE AND WIDEN	PARKWAY DIAMOND OPTION	PARKWAY CIRCLE OPTION
5	Richardson from north of Lyon Street to Francisco	SB	Hour Volume	3717	3094	3087	3130	3138
			Calc. Speed / LOS	19 / C	23 / C	23 / C	23 / C	23 / C
6	Richardson from Francisco to north of Lyon Street	NB	Hour Volume	1443	2259	2161	2817	2851
			Calc. Speed / LOS	26 / B	22 / C	23 / C	18 / D	17 / D
7	Marina Blvd from the Doyle Drive Merge to Lyon Street	EB	Hour Volume	1486	1656	1676	1271	1203
			Calc. Speed / LOS	26 / B	26 / B	26 / B	16 / C ¹	16 / C ¹
8	Marina Blvd from Lyon Street to the Doyle Drive Merge	WB	Hour Volume	606	806	770	230	196
			Calc. Speed / LOS	27 / B	27 / B	27 / B	23 / B ¹	23 / B ¹

Note: 1. Marina Boulevard has a different urban street classification under the two Presidio Parkway Alternative options. Under Base Year, No-Build and Replace and Widen Alternatives, Marina Boulevard has an Urban Street Classification of III and in the Presidio Parkway Alternative options the Classification is IV. Urban Street Classification IV has a FFS range of 25 to 35 mph.

Source: DKS Associates, 2004

Exhibit 3-32
Urban Street Segment Level of Service -- PM Peak Hour

No.	LOCATION	DIR	CRITERIA	BASE YEAR	DESIGN YEAR			
					NO-BUILD	REPLACE AND WIDEN	PARKWAY DIAMOND OPTION	PARKWAY CIRCLE OPTION
5	Richardson from north of Lyon Street to Francisco	SB	Hour Volume	1734	2439	2560	2633	2665
			Calc. Speed / LOS	26 / B	26 / B	26 / B	25 / B	25 / B
6	Richardson from Francisco to north of Lyon Street	NB	Hour Volume	2776	2772	2784	3402	3418
			Calc. Speed / LOS	14 / E	13 / E	13 / E	11 / E	10 / E
7	Marina Blvd from the Doyle Drive Merge to Lyon Street	EB	Hour Volume	873	1047	1178	887	820
			Calc. Speed / LOS	27 / B	27 / B	27 / B	24 / B ¹	22 / B ¹
8	Marina Blvd from Lyon Street to the Doyle Drive Merge	WB	Hour Volume	1817	1875	1787	1276	1233
			Calc. Speed / LOS	25 / B	25 / B	26 / B	28 / A ¹	29 / A ¹

Note: 1. Marina Boulevard has a different urban street classification under the two Presidio Parkway Alternative options. Under Base Year, No-Build and Replace and Widen Alternatives, Marina Boulevard has an Urban Street Classification of III and in the Presidio Parkway Alternative options the Classification is IV. Urban Street Classification IV has a FFS range of 25 to 35 mph.

Source: DKS Associates, 2004

Exhibit 3-33
Urban Street Segment Level of Service -- Weekend Peak Hour

No.	LOCATION	DIR	CRITERIA	BASE YEAR	DESIGN YEAR			
					NO-BUILD	REPLACE AND WIDEN	PARKWAY DIAMOND OPTION	PARKWAY CIRCLE OPTION
5	Richardson from north of Lyon Street to Francisco	SB	Hour Volume	2520	2441	2434	2361	2388
			Calc. Speed / LOS	26 / B	26 / B	26 / B	27 / B	27 / B
6	Richardson from Francisco to north of Lyon Street	NB	Hour Volume	1683	2363	2373	2978	2979
			Calc. Speed / LOS	26 / B	21 / C	20 / C	16 / D	16 / D
7	Marina Blvd from the Doyle Drive Merge to Lyon Street	EB	Hour Volume	1076	960	986	589	525
			Calc. Speed / LOS	27 / B	27 / B	27 / B	26 / A ¹	29 / A ¹
8	Marina Blvd from Lyon Street to Doyle Drive Merge	WB	Hour Volume	941	1142	1078	514	498
			Calc. Speed / LOS	27 / B	27 / B	27 / B	28 / A ¹	29 / A ¹

Note: 1. Marina Boulevard has a different urban street classification under the two Presidio Parkway Alternative options. Under Base Year, No-Build and Replace and Widen Alternatives, Marina Boulevard has an Urban Street Classification of III and in the Presidio Parkway Alternative options the Classification is IV. Urban Street Classification IV has a FFS range of 25 to 35 mph.

Source: DKS Associates, 2004

Overall, an acceptable LOS D⁸ was achieved for all highway segments except for the Golden Gate Bridge operations, particularly during the PM Peak period for all future design year alternatives. It should be noted that the bridge is forecasted to operate with LOS F under the No-Build Alternative; the No-Build Alternative is forecast to not have any further impacts on the Golden Gate Bridge operations.

PM Peak hour speeds on Richardson Avenue in the northbound direction are anticipated to fall to LOS E conditions in the design year in all alternatives. This estimated design deficiency is indicated for the segment level analysis, although all upstream intersections are projected to operate at a sufficient level of service.

As no new deficiencies would result beyond the No-Build Alternative, no mitigation is required.

Segment Weaving. The LOS for the weaving areas was calculated. The results are shown in **Exhibit 3-34**. A less than adequate weave condition (LOS E) was identified on northbound US 101 between the Veterans Boulevard on-ramp and Merchant Road exit-ramp in the base year and in all future alternatives because the Veterans Boulevard on-ramp requires two lanes – which exiting traffic must then cross. To eliminate this potential problem, a Merchant Road slip ramp option is carried forth.

⁸ Visual interpretation of the results show that performance is at a D/E, showing barely adequate suitability.

**Exhibit 3-34
Weaving Analysis**

LOCATION		LEVEL OF SERVICE		
		AM	PM	WEEKEND
Base Year				
1	US 101 Southbound between the Merchant Road entrance ramp and Veterans Blvd exit ramp	C	C	N/A
2	US 101 Northbound between the Veterans Blvd entrance ramp and Merchant Road exit ramp	D	E ²	N/A
3	US 101 Southbound between the Veterans Blvd merge and Richardson/Marina Access exit ramp	C	A	N/A
4	US 101 Northbound between Richardson/Marina Access merge and the Veterans Blvd exit ramp	A	A	N/A
Design Year – No-Build Alternative				
1	US 101 Southbound between the Merchant Road entrance ramp and Veterans Blvd exit ramp	E ²	E ²	D
2	US 101 Northbound between the Veterans Blvd entrance ramp and Merchant Road exit ramp	D	E ¹	D
3	US 101 Southbound between the Veterans Blvd merge and Richardson/Marina Access exit ramp	D	C	C
4	US 101 Northbound between Richardson/Marina Access merge and the Veterans Blvd exit ramp	B	E ²	C
Design Year – Replace and Widen Alternative				
1	US 101 Southbound between the Merchant Road entrance ramp and Veterans Blvd exit ramp	E ²	E ²	D
2	US 101 Northbound between the Veterans Blvd entrance ramp and Merchant Road exit ramp	D	E ²	D
3	US 101 Southbound between the Veterans Blvd merge and Richardson/Marina Access exit ramp	D	B	B
4	US 101 Northbound between Richardson/Marina Access merge and the Veterans Blvd exit ramp	C	E ²	C
Design Year – Presidio Parkway Alternative: Diamond Option				
1	US 101 Southbound between the Merchant Road entrance ramp and Veterans Blvd exit ramp	D/E	D	D
2	US 101 Northbound between the Veterans Blvd entrance ramp and Merchant Road exit ramp	B	E ²	D
3	US 101 Southbound between the Veterans Blvd merge and Richardson/Marina Access exit ramp	C	B	B
4	US 101 Northbound between Richardson/Marina Access merge and the Veterans Blvd exit ramp	B	E ²	C
Design Year -- Presidio Parkway Alternative: Circle Drive Option				
1	US 101 Southbound between the Merchant Road entrance ramp and Veterans Blvd exit ramp	D/E	D	C
2	US 101 Northbound between the Veterans Blvd entrance ramp and Merchant Road exit ramp	B	E ²	C
3	US 101 Southbound between the Veterans Blvd merge and Richardson/Marina Access exit ramp	C	B	B
4	US 101 Northbound between Richardson/Marina Access merge and the Veterans Blvd exit ramp	B	E ²	C

Notes: 1. Deficient weaving remedied with new northbound slip ramp.
2. Design year level of service deficiencies are projected in No-Build Alternative, therefore no additional impacts would occur.

Source: DKS Associates, 2004

The findings also identified a southbound weaving section between the Merchant Road on-ramp and the Veterans Boulevard off-ramp in the AM and PM peak hour (LOS E) in the Alternative 1, No-Build and Alternative 2, Replace and Widen Alternatives. The southbound weave condition at this location was improved by adding a second lane to the exit ramp at Veterans Boulevard in Alternative 5, Presidio Parkway Alternative.

The PM peak hour traffic forecasts also indicate that the northbound segment of Doyle Drive between merge point from Richardson Avenue and Marina Boulevard to the off-ramp at Veterans Boulevard is projected to deteriorate to LOS E during the Design Year in all alternatives. Traffic increases are the primary reason for the level of service deterioration. Therefore, no additional impacts are associated with design alternatives and options.

There are no impacts identified in the segment weaving analysis, since the No-Build Alternative is anticipated to operate at unacceptable levels of service for three of the four segments during at least one time period.

Design Option Weaving Analysis. It is noted that design options found in various alternatives eliminate projected weaving deficiencies for northbound Doyle Drive between Veterans Boulevard and Merchant Road ramps.

As identified above, Doyle Drive under existing conditions, has a continued weaving deficiency for northbound traffic between the Veterans Boulevard on-ramp and Merchant Road off-ramp. This weaving deficiency is a daily occurrence and often would impact mainline traffic circulation on Doyle Drive. This can be eliminated by the Merchant Road Slip Ramp Option which proposes to eliminate this severe weaving problem by providing a slip ramp to Merchant Road. This design option allows Merchant Road off-ramp traffic to access the Toll Plaza and Merchant Road from Doyle Drive without weaving through on-ramp traffic from Veterans Boulevard, thus eliminating the weaving deficiency.

In testing this option in the San Francisco County travel model, the effect was less than 50 vehicles on any link. The result of adding the slip ramp would not drastically affect other traffic volumes in the area. The expected traffic demand is distributed to specific ramps that eliminate the weaving activity and mainline traffic impacts. The one segment with a reduction in volumes would be the mainline segment between Veterans Boulevard and the Merchant Road on-ramp, as the off-ramp traffic would no longer be traveling on this segment. Otherwise, the traffic volumes would change by less than 50 vehicles or 1.1 percent for surrounding segments. This variation is well within the margin of error of a travel model assignment process so that a separate analysis for the Slip Ramp Option would yield no major operational changes beyond the elimination of the weaving.

The loop ramp configuration carried forth in Alternative 5, Presidio Parkway Alternative was designed to maximize the distance from the ramp to the cavalry stables buildings. The ramp can be shortened to a hook ramp configuration for cost savings and a reduction in the roadway footprint.

While the ramp change to a hook ramp would not introduce any additional traffic movements, the slightly shorter distance would result in slight increases to ramp traffic on this segment. It would also create minor changes to traffic on surrounding streets, but these changes are less than seventy-five vehicles or 1.7 percent of the mainline Doyle Drive traffic. This would not create any adverse traffic impacts.

Pedestrian and Bicycle Operations. Both Alternatives 2 and 5 remove the existing adjacent sidewalk along the north side of Doyle Drive which is difficult to use and is ADA non-compliant. New trails that parallel Doyle Drive are in place or planned on both sides of the facility that should accommodate pedestrians including portions of the Bay Trail, Presidio Promenade and the Golden Gate Promenade, as designated in the *Presidio Trails and Bikeways Master Plan*; these trails that parallel Doyle Drive are in place or planned on both sides of the facility. In Alternative 5, the tunnel design would allow for easier access for pedestrians to cross Doyle Drive west of the main post atop the tunnels. Also in Alternative 5, the new access underneath Richardson Avenue would allow for more direct pedestrian movements between the Main Post area and the Palace of Fine Arts. Bicyclists and pedestrians would lose north-south access because of the Marshall Street closure in Alternative 5 options, however, Halleck Street would be available to pedestrians and cyclists about 120 meters to the west.

Alternative routes that are more attractive for pedestrians and bicyclists are available. Therefore, pedestrians and bicyclists would be prohibited on Doyle Drive and hence in the tunnels.

Bicycle activity in the Doyle Drive corridor is accommodated by already-designated bicycle paths and routes on either side of the project area on routes described in the *Presidio Trails and Bikeways Master Plan*.

No adverse impacts are identified to bicycle routes with any alternative.

Preferred Alternative: Refined Presidio Parkway

Following release of the DEIS/R, the project team re-evaluated the transportation and transit analysis for the Preferred Alternative. A summary of this new analysis, as well as potential impacts, are presented below.

Analysis of Marina Boulevard and Richardson Avenue Traffic

The Preferred Alternative contains minor changes in speeds and linkages in certain locations. The overall traffic patterns are not substantively different from the Presidio Parkway Alternative with the Diamond Option. Through speed-reducing design on the mainline segment (Richardson Avenue) east of Halleck Street, the balance of traffic between Richardson Avenue and Marina Boulevard is similar to that found in the No-Build Alternative. **Exhibit 3-35** and **Exhibit 3-36** (on the following page) document the forecasted performance for critical segments of the urban street system. All mainline roadways are forecast to operate with acceptable performance except for northbound Richardson Avenue during the PM peak hour, which is expected to perform at LOS E in both the No-Build and Preferred Alternative conditions.

**Exhibit 3-35
Urban Street Segment Level of Service – Preferred Alternative AM Condition**

No.	LOCATION	DIR	CRITERIA	BASE YEAR	DESIGN YEAR	
					NO-BUILD	PRESIDIO PARKWAY PREFERRED ALTERNATIVE
5	Richardson from north of Lyon Street to Francisco	SB	Hour Volume	3717	3094	2986
			Calc. Speed / LOS	19 / C	23 / C	24 / C
6	Richardson from Francisco to north of Lyon Street	NB	Hour Volume	1443	2259	2158
			Calc. Speed / LOS	26 / B	22 / C	21 / C
7	Marina Blvd from the Doyle Drive Merge to Lyon Street	EB	Hour Volume	1486	1656	1300
			Calc. Speed / LOS	26 / B	26 / B	26 / B
8	Marina Blvd from Lyon Street to Doyle Drive Merge	WB	Hour Volume	606	806	718
			Calc. Speed / LOS	27 / B	27 / B	26 / B

Source: DKS Associates, 2006

Exhibit 3-36
Urban Street Segment Level of Service – Preferred Alternative PM Condition

No.	LOCATION	DIR	CRITERIA	BASE YEAR	DESIGN YEAR	
					NO-BUILD	PRESIDIO PARKWAY PREFERRED ALTERNATIVE
5	Richardson from north of Lyon Street to Francisco	SB	Hour Volume	1734	2439	2403
			Calc. Speed / LOS	26 / B	26 / B	26 / B
6	Richardson from Francisco to north of Lyon Street	NB	Hour Volume	2776	2772	3081
			Calc. Speed / LOS	14 / D	13 / E	13 / E
7	Marina Blvd from the Doyle Drive Merge to Lyon Street	EB	Hour Volume	873	1047	1022
			Calc. Speed / LOS	27 / B	27 / B	26 / B
8	Marina Blvd from Lyon Street to Doyle Drive Merge	WB	Hour Volume	1817	1875	1367
			Calc. Speed / LOS	25 / B	25 / B	27 / A

Source: DKS Associates, 2006

Analysis of Additional Intersections

In response to comments received during the public circulation period of the DEIS/R, an analysis of 21 additional intersections was conducted. These intersections were either local intersections on neighborhood streets, or major intersections located further from the project study area. These are shown in **Exhibit 3-37** (on the following pages) and **Exhibit 3-38** (on the following pages).

No intersections were forecast to fall below anticipated conditions between the No-Build and the Preferred Alternative. All stop-controlled intersections are not expected to operate below LOS C, except for the intersection of Divisadero and Greenwich Streets during the AM peak hour. All signalized intersections are also expected to operate at LOS C or better during the future year, except for Bay and Laguna Streets – a location that is forecast to operate at LOS E in both the No-Build and Preferred Alternative.

Exhibit 3-37
Additional AM Peak Hour Intersection Level of Service Results by Alternative

INTERSECTION			CRITERIA	BASE YEAR	ALTERNATIVES	
#	NORTH/SOUTH	EAST/WEST			NO-BUILD	PRESIDIO PARKWAY PREFERRED ALTERNATIVE
STOP CONTROLLED INTERSECTIONS						
1	Baker	Beach	Delay ¹ LOS	7 A	<1 A	1 A
2	Baker	Francisco	Delay LOS	8 A	11 B	7 A
3	Baker	Lombard	Delay LOS	10 A	9 A	12 B
4	Baker	Greenwich	Delay LOS	8 A	8 A	9 A
5	Baker	Filbert	Delay LOS	8 A	8 A	9 A
6	Broderick	Beach	Delay LOS	8 A	7 A	7 A
7	Broderick	Francisco	Delay LOS	10 B	14 B	9 A
8	Broderick	Chestnut	Delay LOS	9 A	9 A	9 A
9	Broderick	Greenwich	Delay LOS	8 A	9 A	11 B
10	Broderick	Filbert	Delay LOS	8 A	8 A	8 A
11	Divisadero	Francisco	Delay LOS	8 A	7 A	7 A
12	Divisadero	Chestnut	Delay LOS	8 A	8 A	7 A
13	Divisadero	Lombard	Delay ¹ LOS	42 D	36 D	27 C
14	Divisadero	Greenwich	Delay LOS	12 B	17 C	26 D
15	Divisadero	Filbert	Delay LOS	14 B	18 C	18 C
17	Fillmore	Lombard	Delay LOS	14 B	14 B	14 B
18	Scott / Cervantes	Marina	Delay LOS	19 B	15 B	13 B
19	Buchanan / Marina	Beach	Delay LOS	9 A	8 A	8 A

Exhibit 3-37 (Continued)
Additional AM Peak Hour Intersection Level of Service Results by Alternative

INTERSECTION			CRITERIA	BASE YEAR	ALTERNATIVES	
#	NORTH/SOUTH	EAST/WEST			NO-BUILD	PRESIDIO PARKWAY PREFERRED ALTERNATIVE
SIGNALIZED INTERSECTIONS						
20	Laguna	Bay	Delay LOS	34 C	32 C	33 C
21	Van Ness	Bay	Delay LOS	19 B	16 B	15 B
22	Van Ness	Lombard	Delay LOS	19 B	17 B	17 B

Notes 1. Delay is measured in seconds per vehicle

Source: DKS Associates, 2006

Exhibit 3-38
Additional PM Peak Hour Intersection Level of Service Results by Alternative

INTERSECTION			CRITERIA	BASE YEAR	ALTERNATIVES	
#	NORTH/SOUTH	EAST/WEST			NO-BUILD	PRESIDIO PARKWAY PREFERRED ALTERNATIVE
STOP CONTROLLED INTERSECTIONS³						
1	Baker	Beach	Delay ¹ LOS	9 A	9 A	<1 A
2	Baker	Francisco	Delay LOS	8 A	9 A	9 A
3	Baker	Lombard	Delay LOS	9 A	8 A	10 B
4	Baker	Greenwich	Delay LOS	7 A	7 A	8 A
5	Baker	Filbert	Delay LOS	7 A	7 A	8 A
6	Broderick	Beach	Delay LOS	7 A	8 A	7 A
7	Broderick	Francisco	Delay LOS	10 B	11 B	14 B
8	Broderick	Chestnut	Delay LOS	10 B	11 B	9 A
9	Broderick	Greenwich	Delay LOS	9 A	9 A	9 A

Exhibit 3-38 (Continued)
Additional PM Peak Hour Intersection Level of Service Results by Alternative

INTERSECTION		CRITERIA	BASE YEAR	ALTERNATIVES		
#	NORTH/SOUTH			EAST/WEST	NO-BUILD	PRESIDIO PARKWAY PREFERRED ALTERNATIVE
SIGNALIZED INTERSECTIONS						
10	Broderick	Filbert	Delay	8	9	9
			LOS	A	A	A
11	Divisadero	Francisco	Delay	8	9	9
			LOS	A	A	A
12	Divisadero	Chestnut	Delay	13	18	14
			LOS	B	C	B
13	Divisadero	Lombard	Delay ¹	12	13	23
			LOS	B	B	C
14	Divisadero	Greenwich	Delay	15	16	16
			LOS	B	C	C
15	Divisadero	Filbert	Delay	15	17	16
			LOS	C	C	C
17	Fillmore	Lombard	Delay LOS	14 B	15 B	20 C
18	Scott / Cervantes	Marina	Delay LOS	11 B	12 B	13 B
19	Buchanan / Marina	Beach	Delay LOS	60 E	32 C	31 C
20	Laguna	Bay	Delay LOS	41 D	58 E	58 E
21	Van Ness	Bay	Delay LOS	80 E	35 D	17 B
22	Van Ness	Lombard	Delay LOS	30 C	27 C	30 C

Notes 1. Delay is measured in seconds per vehicle

Source: DKS Associates, 2006

Summary of Permanent Impacts by Alternative

Alternative 1: No-Build

Intersection operations on Marina Boulevard at Broderick Street and Divisadero Street would continue to operate at LOS F.

Golden Gate Bridge operations would deteriorate to level of service deficiencies in both directions during weekday peak hours (LOS F in the AM peak hour southbound and PM peak hour northbound; LOS E in the PM peak hour southbound), and during the weekend peak hour (LOS E in both directions). The bridge configuration is anticipated to become three lanes in each direction

for all peak hours, as the percent of peak direction traffic on the bridge lowers by the horizon year.

The Richardson Avenue northbound urban street segment would deteriorate to LOS E during the PM peak hour by the horizon year.

Weaving deficiencies are anticipated for three segments by the horizon year:

- US 101 southbound between the Merchant Road entrance ramp and Veterans Boulevard exit ramp (LOS E at AM and PM peak hours);
- US 101 northbound between the Veterans Boulevard entrance ramp and Merchant Road exit ramp (LOS E at PM peak hour); and
- US 101 northbound between Richardson Avenue/Marina Boulevard access merge and the Veterans Boulevard exit ramp (LOS E at PM peak hour).

Alternative 2: Replace and Widen

Intersection operations would not worsen beyond a No-Build condition, however, additional spillback from westbound Lombard Street at Richardson Avenue eastward beyond Broderick Street would occur unless the Richardson northbound slip ramp to Marshall Street is maintained.

No additional segment level of service deficiencies are anticipated beyond those identified the base condition (No-Build).

No additional weaving deficiencies are anticipated for segments beyond the No-Build condition. The weaving deficiency for US 101 southbound between the Merchant Road entrance ramp and Veterans Boulevard exit ramp would be improved by a second lane on the exit ramp.

A pedestrian sidewalk adjacent to Doyle Drive through a north side pedestrian sidewalk would be removed, but parallel trails provide a more suitable pedestrian environment.

No adverse impacts are identified to bicycle routes with this alternative.

Alternative 5: Presidio Parkway

Intersection operations would not worsen beyond the base condition (No-Build).

No additional segment level of service deficiencies are anticipated beyond those identified in the base condition.

No additional weaving deficiencies are anticipated for segments beyond the No-Build condition. The weaving deficiency for US 101 southbound between the Merchant Road entrance ramp and Veterans Boulevard exit ramp would be improved by a second lane on the exit ramp.

A pedestrian sidewalk adjacent to Doyle Drive through a north side pedestrian sidewalk would be removed, but parallel trails provide a more suitable pedestrian environment.

No adverse impacts are identified to bicycle routes with this alternative.

Preferred Alternative

Permanent impacts of the Preferred Alternative reflect those in the Presidio Parkway impacts as identified and discussed in the above section. These are:

Intersection operations will not worsen beyond the base condition (No-Build).

No additional segment level of service deficiencies are anticipated beyond those identified in the base condition.

No additional weaving deficiencies are anticipated for segments beyond the base condition. The weaving deficiency for US 101 southbound between the Merchant Road entrance ramp and Veterans Boulevard exit ramp will be improved by a second lane on the exit ramp.

A pedestrian sidewalk adjacent to Doyle Drive through a north side pedestrian sidewalk will be removed, but parallel trails will provide a more suitable pedestrian environment. The *Presidio Trust Strategic Plan, Fiscal Years 2005 to 2009*, includes a compliance strategy for sidewalks within the Presidio, including the parallel trails and ADA compliance for streets, sidewalks and bus stops.

No adverse impacts are identified to bicycle routes.

Avoidance, Minimization and/or Mitigation

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. No permanent impacts are anticipated therefore no mitigation will be required.

During final design, a formal *Transportation Management Plan* (TMP) will include strategies to address construction equipment, signage, and general area-wide traffic reduction and management (see **Appendix K** for a draft version of the TMP prepared for this project). During construction, the implementation of traffic reduction and management strategies by the project proponent will minimize potential pedestrian, bicycle, and traffic impacts. Measures which will be included in the TMP will include, but not be limited to:

- encouraging alternatives, such as use of local San Francisco arterial streets (for local San Francisco traffic), shifting travel to other time periods, or use of transit;
- coordinating an overall trip reduction strategy; and
- interactive traffic monitoring, as appropriate, would be implemented to determine the best strategies for alleviating possible bottlenecks.

3.2.9 Transit

The Doyle Drive Project study area is currently served by the San Francisco Municipal Railway (Muni), and Golden Gate Transit (operated by the Golden Gate Bridge, Highway and Transit District). The Presidio Trust also operates transit service (PresidiGo) within and through the project area. Doyle Drive carries Muni and GGHTB transit service.

Regulatory Setting

Although no specific regulations exist which require direct analysis of impacts to transit service, both the *National Environmental Policy Act* (NEPA) and the *California Environmental Quality Act* (CEQA) require the review and analysis of potential impacts to community services and environmental justice, as well as transportation systems.

Affected Environment

MUNI, Golden Gate Transit, and Presidio Trust buses operate transit service within and through the study area. Muni Route 28 is an important cross-town route that connects areas on the western side of San Francisco with the Presidio and Fort Mason.

Golden Gate Transit buses that operate on Doyle Drive provide public transit service between San Francisco and Marin and Sonoma counties. This service falls into two general categories: “Basic” service, which operates on a 24-hour/7-days per week basis, and “Commute” service, which operates on a peak period/peak direction weekday basis. In addition, the Presidio Trust shuttle (PresidiGo) operates in the study area, although it does not use Doyle Drive.

The following bus routes have some, or part, of their route on Doyle Drive:

- Muni Bus Routes: 28 and 76; and
- Golden Gate Transit Bus Routes: 2, 4, 8, 10, 18, 24, 26, 27, 38, 44, 50, 54, 56, 58, 60, 70, 72, 73, 74, 76, 80, and 97.

As shown, Golden Gate Transit is heavily oriented to peak period and peak direction service, resulting in about two-thirds of all buses traveling in the peak direction during each peak period.

In addition to public transit services, other buses operate in the study corridor. GGBHTD operates a subscription bus service across the Golden Gate Bridge to Doyle Drive. Also tour buses, private buses (that travel to San Francisco), and Airport buses (which provide service to San Francisco International Airport) operate in this corridor.

Temporary Impacts

Transit services will continue to operate as the project moves forward. Once final construction staging plans are developed, it is anticipated that some routes

may require temporary re-routing. Sufficient notice will be given to the general public regarding new, temporary routes within the project study area in addition to temporary bus route detours during the two full weekend closures.

Permanent Impacts

A ridership, level of service, and travel time analysis was prepared in order to measure anticipated impacts on future transit service. The *South Access to the Golden Gate Bridge: Doyle Drive Project Transit and Transportation Report* (December 2004) provides detailed methodology and analysis results. The following provides an overview of the findings.

Ridership

An evaluation of the overall transit ridership at the southern edge of the Presidio (Muni Route 28, 29, 43; Golden Gate Transit Route 50) and eastern edge of the Presidio (Muni Route 28, 43, 82X; Golden Gate Transit Routes into San Francisco except Route 50) was made. None of the build alternatives increased ridership by more than one percent in either the AM or PM peak hour. Thus, no impacts on the capacity of these routes are anticipated.

Travel Time

Under the No-Build Alternative, increased regional traffic results in reduced travel speeds for the local transit operators. Travel times are expected to increase about one minute on all transit routes in peak directions when compared to year 2000 travel times.

Transit services will continue to operate on the same routing in all alternatives, and no major changes in transit travel times are expected to occur with any alternative. In Alternative 5 and the Preferred Alternative, some transit routes may stop on Richardson Avenue at Lyon Street, rather than nearby Francisco Street, thus creating a more centralized location for transit connections. Additional bus pull-out facilities with these alternatives would enhance transit service. This improved transit hub could accommodate timed transfers and improve connections between local transit service and Presidio Shuttle service thus providing an improved transit option through the corridor.

Level of Service

The results of the analysis are provided on a route-by-route basis. While alternatives show different loads on different routes, total Golden Gate Transit ridership in this corridor is forecast to be approximately 11,700 two-way average weekday riders under the No-Build Alternative. This should not vary by more than 100 riders for any of the alternatives.

Therefore, no alternative is anticipated to induce additional bus demand above the baseline condition (Alternative 1, No-Build).

Avoidance, Minimization and Mitigation

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. Once final construction staging plans are developed, it is anticipated that some routes may require temporary re-routing. The TMP prepared as part of this project will address bus re-routing (see **Appendix K** for the draft TMP prepared for this project). Sufficient notice will be given to the general public regarding new, temporary routes within the project study area in addition to temporary bus route detours during the two full weekend closures. All potential bus route detours will be done in coordination with Golden Gate Transit to minimize impacts to operations and riders.

3.2.10 Visual and Aesthetics

What people see everyday within their community, such as greenspaces, roads, and buildings, forms much of their mental image of and attitudes toward that community. Research has shown that most people would generally agree on which views have high or low visual quality; however, defining visual quality for an environmental analysis requires a detailed methodology and analysis.

This chapter summarizes how visual characteristics of Doyle Drive were studied by conducting a visual quality assessment. It also highlights how construction and operations of the project would affect the visual characteristics found within the project area. Visual quality and impacts were developed using guidelines provided in the Federal Highway Administration's (FHWA) *Visual Impact Assessment for Highway Projects*. Detailed descriptions of this methodology and the results of the visual assessment can be found in the *South Access to the Golden Gate Bridge: Doyle Drive Visual Impact Assessment Revision 2*, October 2004.

Regulatory Setting

The *National Environmental Policy Act* (NEPA) and the *California Environmental Quality Act* (CEQA) require the review of the potential visual impact of a proposed project.

As part of this analysis, four primary planning documents were reviewed and considered as part of this visual quality assessment. These plans are the:

- *Final General Management Plan Amendment and Final Environmental Impact Statement* (GMPA);
- *Presidio Trust Management Plan* (PTMP);
- *San Francisco Bay Plan* (SFBP); and
- *San Francisco Master Plan* (SFMP).

All four of these documents set forth scenic and visual resource goals and policies intended to preserve, enhance, restore and respect scenic vistas, historic structures and visually important landscapes, and streetscapes within the Presidio and surrounding neighborhoods.

Affected Environment

Doyle Drive is located at the southern end of the Golden Gate Bridge — one of the most recognized symbols of San Francisco and northern California, and an architectural and engineering wonder. At the east end of Doyle Drive is the city of San Francisco, which in its own right is considered a scenic, architectural and engineering wonder. The Presidio, a military-post-turned-National-Park, has a unique scenic character. Much of this former military post is open space with woodlands of eucalyptus, cypress and Monterey pines. The waters of the Bay and the Pacific Ocean are almost always active, as they contain major shipping routes for the transportation of goods in and out of the Ports of Oakland and San Francisco. From almost any vantage point, on any given day, each of these elements play a part in the regional aesthetic character of the Bay Area.

Doyle Drive's Regional and Local Landscape

Doyle Drive is a primary transportation corridor. From points north of Doyle Drive, along Crissy Field and Mason Street, Doyle Drive is noticeable because of its elevated position along the bluffs, heavy support columns of the low-viaduct and steel truss sections of the high-viaduct. From the south side, Doyle Drive is less noticeable because of the intervening topography, vegetation and buildings. The most prominent element of Doyle Drive is the low-viaduct, while the high-viaduct is a very memorable structural element. The steel elements, which are painted international orange, along with the light gray color of the concrete columns, stand out against the green-forested background of the Presidio. When viewed from a distance, this high-viaduct forms a continuous linear feature and connects visually to the Golden Gate Bridge.

View from Doyle Drive

Motorists traveling on Doyle Drive have a wide variety of visual experiences. When traveling northbound from San Francisco, it is quite evident that the viewer is leaving the urban environment of San Francisco, and entering the more natural setting of the Presidio and, after crossing the Golden Gate Bridge, Marin County. However, this transition is gradual as the Presidio provides a progression of visual character from urban (areas around Gorgas Gate and the Main Post) to broad elevated views of the Golden Gate Bridge, San Francisco Bay, and Crissy Field, to wooded and natural areas, before reaching the Golden Gate Bridge Toll Plaza.

In the reverse direction (from north to south), the visual character of Doyle Drive transitions from an area with natural characteristics to an urban character, as views of San Francisco become more prominent for motorists traveling south. The best views for motorists occur in the southbound direction as Doyle Drive leads away from the Toll Plaza and comes out of the wooded areas near the Park Presidio Interchange.

In this area, views of San Francisco, the Bay, Crissy Field, and Alcatraz Island are predominant. Further on, there are close-up views of the Main Post area, the

National Cemetery, and the dome of the Palace of Fine Arts. Solid 0.9 meter (three-foot) tall concrete barriers line the outside shoulders of Doyle Drive, thus obstructing the lower portion of the view immediately adjacent to the roadway.

Temporary Impacts

Temporary impacts, often associated with construction of the transportation facility, are discussed in this section.

During the 4 to 5 year construction period, all build alternatives will result in an adverse change in the visual character of the study area. All build alternatives will require the removal of existing landscaping and vegetation during construction, resulting in an adverse 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. While light and glare from nighttime construction lighting will be considered an adverse effect, it will be temporary in duration. In addition, portable construction lighting will be required to be down-focused and oriented away from residential areas whenever feasible to reduce potential nighttime disturbance.

Alternative 1: No-Build

The No-Build Alternative would have no visual impact since it would not change the existing visual environment.

Alternative 2: Replace and Widen

During construction, the Replace and Widen Alternative - With Detour Option would result in visual changes primarily due to the construction of a temporary detour structure. Construction activities would require the presence of substantial amounts of equipment during this process and would include grading and the removal of plants and trees for construction. Under this option, a 20.4-meter (67 foot) wide temporary detour facility would be constructed to the north of existing Doyle Drive to maintain traffic through the construction period.

During construction, the No-Detour Option would have less impact than the With Detour Option because it would not require the construction of a detour facility. The widened portion of the new facility would be constructed on both sides and above the existing low-viaduct and would maintain traffic on the existing structure. Traffic would be incrementally shifted to the new facility as it is widened over the top of the existing structure. Once all traffic is on the new structure, the existing structure would be demolished and the new portions of the facility would be connected. Similar to the With Detour Option, construction activities would require the presence of substantial amounts of equipment during this process and would include grading and the removal of plants and trees for construction.

Alternative 5: Presidio Parkway

Construction activities of the Presidio Parkway Alternative would require the presence of substantial amounts of equipment during this process and would include grading, the removal of plants and trees, and demolition of existing structures.

At the Veterans Boulevard Interchange, Option 1, Loop Ramp would require greater removal of vegetation than Option 2, Hook Ramp on the north side of the interchange area. Option 2, Hook Ramp would require the removal of a row of eucalyptus trees at the southeast corner of the interchange.

Preferred Alternative

Similar to all build alternatives, the Preferred Alternative will require the presence of construction equipment and disruption of the landscape due to grading activities, the removal of plants and trees, and the demolition of existing structures. In addition, the Preferred Alternative will require a temporary detour structure along the northern edge of the roadway from Building 610 to Richardson Avenue.

Permanent Impacts

This section presents a summary of permanent, direct impacts on visual quality resulting from the proposed Doyle Drive Project. **Appendix C** presents detailed information regarding visual impacts based on the analysis of six landscape units and 19 key viewpoints.

Visual changes and potential visual impacts of the proposed alternatives were studied within six landscape units which make up the project limits. The No-Build Alternative would have no visual impact since it would not change the existing visual environment. Similarly, Alternative 2 – Replace and Widen would have minimal long-term visual impact since it involves only modest changes to the existing facility. Alternative 5 - Presidio Parkway and the Preferred Alternative would result in the most noticeable long-term visual changes because both the location and profile of the roadway would change substantially including the removal of several buildings within the landscape units.

Nineteen key viewpoints were selected based on visibility to sensitive viewers, specific views identified as important by the public and participating agencies and, the typical views available to the public. For each viewpoint, computer-generated simulations of each of the build alternatives were prepared. These simulations were used to evaluate the potential change in visual quality.

Exhibit 3-39 provides a summary of impacts for the 19 viewpoints. **Exhibit 3-40** (on the following pages) illustrates the general location of these viewpoints. In addition, six key viewpoints which illustrate the visual changes associated with the alternatives are presented in **Exhibits 3-41** through **3-45** at the end of this section. The effects of the project alternatives generally fall into one of two categories, they either:

1. Produce relatively little long term change and therefore maintain current levels of visual quality and also maintain existing views available to motorists on Doyle Drive, but fail to improve visual quality where it may be affected by the existing Doyle Drive in certain areas of the Presidio; or
2. Produce substantial long term change, much of which improves visual quality in certain areas of the Presidio by removing portions of the existing elevated structures and placing Doyle Drive underground, but at the same time eliminate views that motorists now enjoy from those portions of Doyle Drive.

The following brief summary highlights these effects for each alternative.

Alternative 1: No-Build

The No-Build Alternative would have no visual impact since it would not change the existing visual environment.

Alternative 2: Replace and Widen

The Replace and Widen Alternative would have minimal long-term visual impacts since it involves only modest changes to the existing facility. The Replace and Widen Alternative – With Detour Option falls into the first category because it would result in little change in existing visual conditions. The Replace and Widen - No-Detour Option would fall between these two categories. The primary visual change associated with this alternative would be the raising of the low-viaduct structure approximately two meters (six feet) and an almost doubling of the width of the roadway. This significant increase in the mass and scale of the roadway would increase the visual and physical separation between the upper and lower posts that was created along the bluffs between the National Cemetery and Halleck Street when Doyle Drive was first constructed. The boundary of the bluffs marks a functional separation between the urban functions of the upper post and the industrial functions that occurred in the lower post. The Replace and Widen – No-Detour Option would cover such a vast expanse along the bluffs that this character defining element of the Presidio would be obscured, resulting in a negative visual effect.

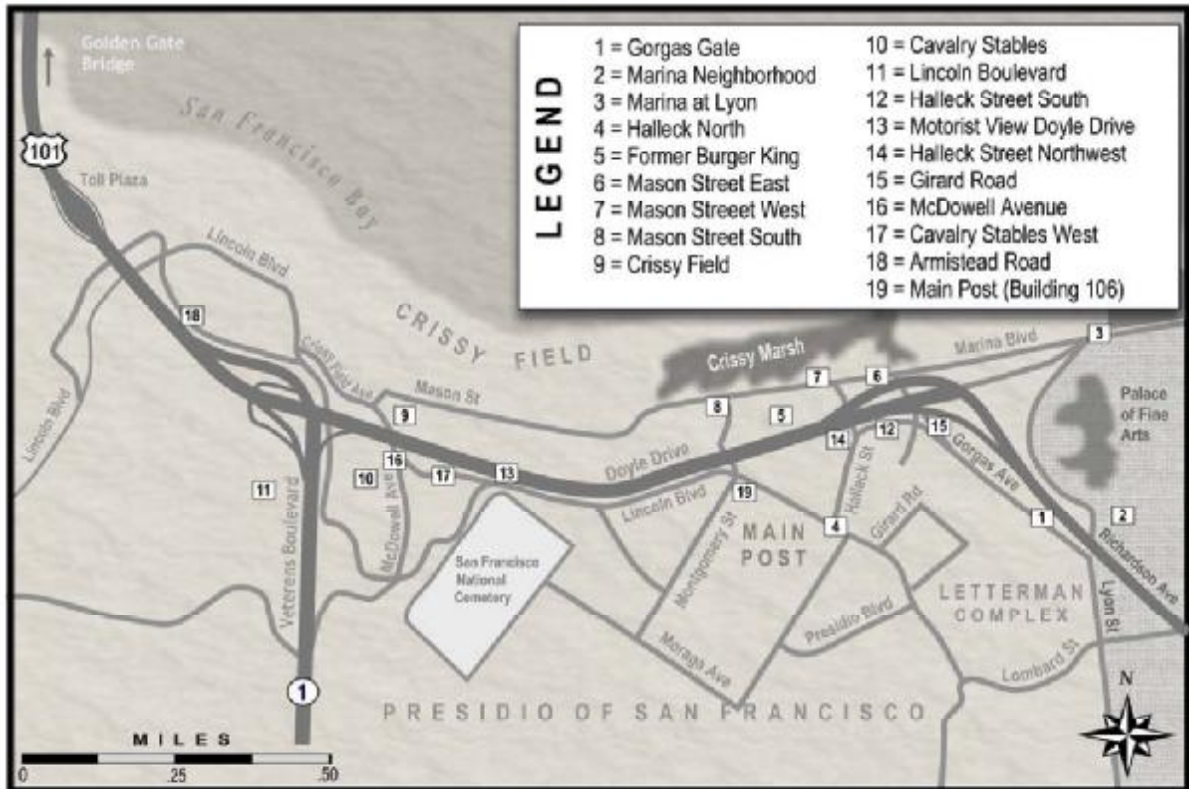
Exhibit 3-39
Summary of Effects on Visual Quality by Viewpoint

	EXISTING LEVEL OF VISUAL QUALITY	REPLACE AND WIDEN (NO-DETOUR OPTION)	REPLACE AND WIDEN (DETOUR OPTION)	PRESIDIO PARKWAY	PREFERRED ALTERNATIVE: REFINED PRESIDIO PARKWAY
Gorgas Gate (1)	Low	Negligible	Negligible	Negligible	Negligible
Marina Neighborhood (2)	Low	Negligible	Negligible	Beneficial	Beneficial
Marina at Lyon (3)	Low	Negligible	Negligible	Adverse	Adverse
Halleck North (4)	Low	Slightly Adverse	Negligible	Beneficial	Beneficial
Former Burger King (5)	Low	Slightly Adverse	Negligible	Strongly Beneficial	Strongly Beneficial
Mason Street East (6)	Low	Negligible	Negligible	Strongly Beneficial	Strongly Beneficial
Mason Street West (7)	Low	Negligible	Negligible	Strongly Beneficial	Strongly Beneficial
Mason Street South (8)	Low	Beneficial	Beneficial	Strongly Beneficial	Strongly Beneficial
Crissy Field (9)	Medium	Negligible	Negligible	Negligible	Negligible
Cavalry Stables (10)	Medium	Negligible	Negligible	Negligible	Negligible
Lincoln Boulevard (11)	Medium	Negligible	Negligible	Negligible	Negligible
Halleck Street South (12)	Low	Negligible	Negligible	Strongly Beneficial	Strongly Beneficial
Motorist's View Doyle Drive (13)	Medium	Negligible	Negligible	Strongly Adverse	Strongly Adverse
Halleck Northwest (14)	Medium	Negligible	Negligible	Beneficial	Beneficial
Girard Road (15)	Medium	Slightly Adverse	Slightly Adverse	Adverse	Adverse
McDowell Avenue (16)	Medium	Minimally Adverse	Minimally Adverse	Minimally Adverse	Minimally Adverse
Cavalry Stables West (17)	Medium	Minimally Adverse	Minimally Adverse	Minimally Adverse	Minimally Adverse
Armistead Road (18)	Medium	No Change	No Change	Negligible to Adverse*	Negligible
Main Post (Building 106) (19)	Medium	Adverse	Negligible	Minimally Beneficial	Minimally Beneficial

Note: Under the No-Build Alternative, there would be no change in existing levels of visual quality as seen from any of the nineteen viewpoints.

**The Presidio Parkway Alternative includes two options in the Armistead Road area – with and without a Merchant Road slip ramp. The with slip-ramp option would result in a negligible effect on visual quality, while the without slip-ramp option would result in an adverse effect on visual quality as a result of substantial tree removal.*

Exhibit 3-40
General Location of Viewpoints



Note: Viewpoint locations represent the locations of simulations and photographs presented in this visual quality analysis.

Alternative 5: Presidio Parkway

The Presidio Parkway Alternative would have the longest construction period and long-term visual changes because both the location and profile of the roadway would change substantially.

Under the Presidio Parkway Alternative, similar to the Replace and Widen, the existing high- and low-viaduct structures would be demolished and new facilities would be constructed. However, the Presidio Parkway Alternative would place portions of the low-viaduct structure below grade and/or underground, thus removing portions of it from the existing landscape. The Presidio Parkway Alternative also provides direct connections between Doyle Drive and local roads within the Presidio, requiring realignment of streets, removal of several buildings, and redevelopment of portions of the affected areas. Such actions would produce changes and localized improvements in visual quality in some areas, especially in the lower Tennessee Hollow area. Modifications associated

with the Presidio Parkway Alternative would restore visual connections between areas of the Presidio that have been separated by Doyle Drive's low-viaduct.

The Merchant Road Slip Ramp Option, which would serve the Golden Gate Bridge facilities, visitor areas and areas of the Presidio such as Fort Scott and Battery East, would require the removal of a row of trees along the north side of Doyle Drive, as well as the removal of the row of apartment buildings along Armistead Road. Doyle Drive would be widened to accommodate the new ramp lane serving Merchant Road along the north side of the road.

Preferred Alternative: Refined Presidio Parkway

Under the Preferred Alternative, the existing high- and low-viaduct structures will be demolished and new facilities will be constructed. The Preferred Alternative will place portions of the low-viaduct structure below grade and/or underground, thus removing portions of it from the existing landscape. In these areas, the motorist's view will change dramatically and be considered adverse since the existing view of the National Cemetery, woodlands, Main Post and Crissy Field will be completely obstructed. The Preferred Alternative also provides direct connections between Doyle Drive and local roads within the Presidio, requiring realignment of streets, removal of several buildings, and redevelopment of portions of the affected areas. Such actions will produce changes and localized improvements in visual quality in some areas, especially in the lower Tennessee Hollow area. Modifications associated with the Preferred Alternative will restore visual connections between areas of the Presidio that have been separated by Doyle Drive's low-viaduct.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. During the approximately three and a half year construction period, the Preferred Alternative will result in a substantial adverse change in the visual character of the study area. The Preferred Alternative will require the removal of existing landscaping and vegetation during construction, resulting in a substantial negative visual impact. After construction is complete, including the removal of the detour road and structure, all temporarily affected areas will be restored to their appropriate native vegetation in natural areas, or appropriate ornamental vegetation type in landscaped areas. In some areas, full restoration of mature natural species may take between 10 and 20 years.

Design guidelines for restoration of temporarily affected areas will be developed by the project proponent in conjunction with the Presidio Trust, the National Park Service, Caltrans, and the State Office of Historic Preservation. The design guidelines will be a collaborative effort, and will provide a planning and design framework for the new construction and associated landscaping for Doyle Drive. The design guidelines will incorporate the Secretary of Interior's *Standards for Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (National Parks Service, 1995). The design guidelines will provide a framework to ensure that the design and construction of Doyle Drive will be compatible

with the Golden Gate Bridge historic district and that the associated landscape will be compatible with the Presidio of San Francisco National Historic Landmark District. Within the design guidelines, restoration criteria will include general restoration concepts and methods, including matching the original lighting standards of Doyle Drive which match those of the Golden Gate Bridge. Lighting will be done with the best available and most feasible technology.

Guidelines, in accordance with the *Presidio Vegetation Management Plan*, will also be developed by the project proponent in conjunction with the Presidio Trust, the National Park Service, Caltrans, and the State Office of Historic Preservation to ensure appropriate vegetation and landscaping restoration. Based on the principles in the *Presidio Vegetation Management Plan* and the *Presidio Trust Management Plan*, some vegetation could be selectively removed to enhance views where appropriate and in consultation with the Presidio Trust.

The project proponent will monitor restored areas following plant installation using standard ecological methods that qualitatively estimate plant cover and to document survival rates and growth characteristics until performance criteria are met.

Exhibit 3-41
Viewpoint 2: Richardson Avenue at Bay Street



Existing Conditions



Replace and Widen Alternative



Parkway Alternative, Diamond Option



Parkway Alternative, Circle Option



Preferred Alternative

Exhibit 3-42
Viewpoint 6: Mason Street East



Existing Conditions



Replace and Widen Alternative, No Detour Option



Replace and Widen Alternative, Detour Option
(Unmitigated)



Replace and Widen Alternative, Detour Option



Presidio Parkway Alternative



Preferred Alternative

Exhibit 3-43
Viewpoint 14: Halleck Northwest



Existing Conditions



Replace and Widen Alternative, No Detour Option



Replace and Widen Alternative, Detour Option



Presidio Parkway Alternative



Preferred Alternative

Exhibit 3-44
Viewpoint 15: Girard Road



Existing Conditions



Replace and Widen Alternative, No Detour Option



Replace and Widen Alternative, Detour Option



Presidio Parkway Alternative



Preferred Alternative

Exhibit 3-45
Viewpoint 17: Calvary Stables West



Existing Conditions



Replace and Widen Alternative



Presidio Parkway Alternative



Preferred Alternative

3.2.11 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 Doyle Drive project area and the Presidio of San Francisco contain a rich collection of cultural resources, including archaeological sites, historic buildings, structures and objects, and cultural landscape features. These include the Presidio National Historic Landmark District (PNHLD) and its contributing elements, the Doyle Drive viaducts, the Golden Gate Bridge (to which Doyle Drive is a contributor), the Palace of Fine Arts, and a prehistoric archaeological site known as CA-SFR 6/26.

Regulatory Setting

A number of federal and state laws and regulations govern the treatment of cultural resources for the Doyle Drive Project. These include the *National Historic Preservation Act* (NHPA), and the *California Environmental Quality Act* (CEQA).

NHPA sets forth policy and procedures regarding "historic properties" – that is, districts, sites, buildings, structures, and objects included in or eligible for the *National Register of Historic Places* (NRHP), including cultural landscapes. *Section 106* of the NRHP (1966, as amended) requires that before implementing any federal undertaking, a federal agency must take into account the effects of its undertaking on historic properties and afford the Advisory Council on Historic Preservation (ACHP) and other interested parties an opportunity to comment on these actions. See **Appendix I** for letters regarding ACHP consultation in the project.

The NHPA also requires that agencies minimize harm to NHL's to the maximum extent possible (NHPA 110(f) and 36 CFR 800.10). In addition, because the project would have an adverse effect on an NHL, the Secretary of the Interior must also be invited into the *Section 106* consultation process (see **Appendix I** for the invitation letter to the Secretary of the Interior).

The NHPA defines an effect as an alteration to the characteristics of a historic property that qualify it for inclusion in or eligibility for the NRHP. Effects can be found adverse or not adverse. Adverse effects are defined by the *Criteria of Adverse Effect* as outlined in 36 CFR 800.5(a)(1). An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify that property for inclusion in the NRHP in a manner that would diminish the integrity of that property's location, design, setting, materials, workmanship, feeling, or association. In applying the criteria of adverse effect, regulations require that consideration be given to all qualifying characteristics of a historic property, including those that may have been

identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. Examples of adverse effects on historic properties include, but are not limited to:

- 1) Physical destruction of or damage to all or part of the property;
- 2) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;
- 3) Removal of the property from its historic location;
- 4) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- 5) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
- 6) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
- 7) Transfer, lease, or sale of property out of Federal ownership or control or conditions to ensure long-term preservation of the property's historic significance.⁹

CEQA requires the lead CEQA agency to assess the effects of the project on historical and archaeological resources. These resources are defined as buildings, sites, structures, objects, or districts (as well as cultural landscapes) – each of which may have historical, architectural, scientific, archaeological, cultural, or engineering importance.

If Native American human remains are discovered on federal land then the requirements of the *Native American Graves Protection and Repatriation Act* (NAGPRA) must be followed. If the remains are found on non-federal land the procedures outlined in *Public Resources Code 5097* would apply.

Status of Section 106 Compliance Process

FHWA established that the Doyle Drive 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 area of potential effects (APE).¹⁰ This was followed by a program to identify historic properties in the

⁹ 36 CFR 800.5, "Assessment of adverse effect," incorporating amendments effective August 5, 2004.

¹⁰ An APE is a specific study area established for a cultural resources analysis. The extent of the study

APE. These efforts were documented in a *Historic Property Survey Report* (HPSR). The HPSR was submitted to the State Historic Preservation Officer (SHPO) in 2002, who concurred with the following findings (see **Appendix I** 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 contributors¹¹ to the NHL, remain eligible for listing in the NRHP under criteria established by 36 CFR 60.4;
- The 55 Cold War-era architectural properties in the NHL located in the APE, that were constructed after the district's period of significance and have become 50 years of age since 1993, are not eligible for inclusion in the NRHP under any of the criteria established by 36 CFR 60.4;
- The 35 architectural properties located in the Marina neighborhood outside of the Presidio, but in the APE, are not eligible for inclusion in the NRHP under any of the criteria established by 36 CFR 60.4;
- Archaeological site CA-SFR-6/26 is individually eligible for inclusion in the NRHP under Criterion D as set forth in 36 CFR 60.4.

The nomination of the Palace of Fine Arts to the NRHP was accepted by the Keeper of the NRHP and listed in the NRHP in December 2005.

Additionally, prior to the submittal of the HPSR for the Doyle Drive Project, the two Doyle Drive viaducts had been determined to be individually eligible for the NRHP (1987). The Golden Gate Bridge had also been nominated, but not yet listed, as a National Historic Landmark, with Doyle Drive as a contributing element (1997); for the purposes of *Section 106* compliance, these resources are considered historic properties.

A *Finding of Effect* (FOE) was then prepared for agency review (see **Appendix I** for the SHPO letter regarding the FOE received in January 2006). The FOE assesses the potential for this project to cause adverse effects on historic properties and initiates the process to resolve those adverse effects. An Addendum FOE was prepared to address the effects of the refined Presidio Parkway Alternative. The Addendum FOE was forwarded by FHWA to the SHPO and ACHP on May 2, 2007 (see **Appendix I** for the correspondence with the SHPO regarding the FOE Addendum).

area is dependent upon potential historic or archaeological resources in the general area. 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 Doyle Drive Project.

¹¹ *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.*

Measures taken to mitigate adverse effects of the project have been addressed in the executed *Programmatic Agreement* (PA) (see **Appendix I**). The PA was developed in coordination with FHWA, the SHPO, the ACHP, the federal cooperating agencies and other interested parties. It calls for a *Built Environment Treatment Plan* and an *Archaeology Treatment Plan* to specifically address the effects of the project on NRHP-eligible properties and outline the measures that will be implemented to mitigate these effects. Final drafts of these treatment plans have been reviewed and approved by FHWA and will be sent to the signatories, invited signatories, and concurring parties in mid October 2008 for review and comments. Final treatment plans will be completed by the end of November 2008, in advance of the *Record of Decision* (ROD).

Methodology

A number of technical studies were completed prior to preparation of this environmental document. These included several inventory reports, consisting of archaeological survey report (ASR) [Jones & Stokes, August 2002], an historic architectural survey report (HASR) [JRP Historical Consulting, August 2002], and historic properties survey report (HPSR) [Jones & Stokes, August 2002]. These combined reports document the known and predicted resources in the project's APEs. In addition, an archaeological evaluation report was prepared based on the excavation and analysis of CA-SFR-6/26. These inventory reports were followed by the preparation of a FOE (Jones & Stokes 2005), which describes the effect of the project's alternatives on known and predicted historic properties. These identification reports and the FOE form the basis for the effects assessment in the following analysis. An Addendum FOE (Jones & Stokes 2007) was prepared specifically to address the effects of the Preferred Alternative.

Affected Environment

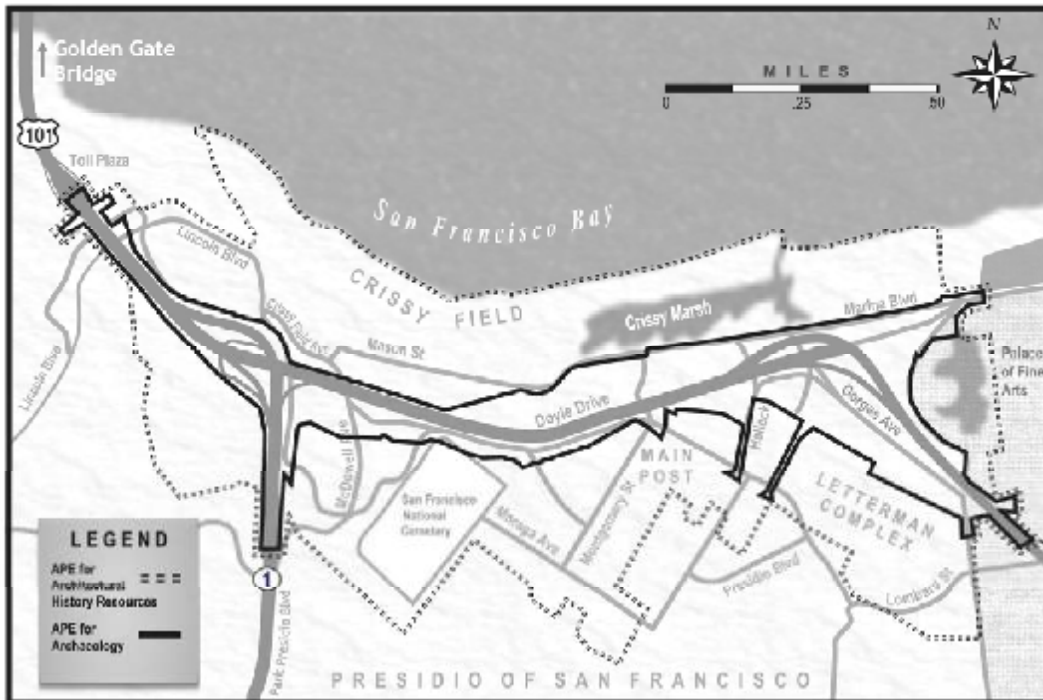
As shown in **Exhibit 3-46** two focused APEs were developed to identify and analyze the potential effects of the project on cultural resources. One focused APE was for architectural resources and one was for archaeological resources. Both focused APEs meet the definition of an APE set forth in 36 CFR 800.16(d).

The historic properties in the APEs that are eligible for, or listed in, the NRHP are: the Presidio NHL and its contributors, prehistoric archaeological site CA-SFR-6/26, the Presidio Viaduct and the Marina Viaduct of Doyle Drive (Bridges 34 0019 and 34 0014), the Golden Gate Bridge (to which Doyle Drive is a contributor), and the Palace of Fine Arts. Although the Golden Gate Bridge is not within the APE, Doyle Drive is a contributor to the Golden Gate Bridge historic property.

Presidio National Historic Landmark District

The Presidio of San Francisco is a National Historic Landmark District (NHL). NHLs are properties that have been recognized by the Secretary of the Interior

Exhibit 3-46
Doyle Drive Project Area of Potential Effect (APE)



as possessing national significance and are the highest possible designation of historic significance. NHL's are places that possess exceptional value or quality in illustrating and interpreting the heritage of the United States. Nationally significant properties help us understand the history of the Nation and illustrate the nationwide impact of events or persons associated with the property, its architectural type or style, or information potential. A nationally significant property, like the Presidio of San Francisco, is of exceptional value for its ability to represent or illustrate an important theme in the history of the Nation. All NHLs are also included in the NRHP, which is the official list of the Nation's historic properties worthy of preservation.

The Presidio NHLD encompasses the lands of the former Presidio of San Francisco military reservation, and has been the subject of a variety of studies before the initiation of the Doyle Drive Project. The federal government listed the Presidio as a NHL in 1962 and listed it in the NRHP in 1966. In 1993, the NPS National Register Program prepared and submitted an "upgraded NHL documentation" for the Presidio NHLD that the Keeper of the National Register approved.¹² Doyle Drive was identified as a contributor to the NHLD in this documentation.

¹² NPS, "Presidio ... Registration Forms" 1993; NPS and Land and Community Associates, "Presidio of San Francisco: Cultural Landscape Report, Work in Progress, Phase One Priority Areas" November 1992.

The focused architectural history APE includes a portion of the Presidio NHLD that contains approximately 280 resources, including buildings, structures, objects and sites that are contributors to the Presidio NHLD. These and other elements together contribute to the cultural landscape found on the Presidio. In addition to the individually listed or eligible properties in the architectural APE, **Appendix D** provides a list of the contributors to the NHLD that are in the APE.

Approximately 210 of the contributing elements to the NHLD in the architectural history APE are not in close proximity to the alignment of the build alternatives and would not experience a direct, indirect, or cumulative adverse effect largely because of their distance from the project. Approximately 70 contributors to the NHLD are in close proximity to the project area and could experience adverse effects under one or more of the build alternatives.

CA-SFR-6/26

One prehistoric archaeological site, CA-SFR-6/26, was located during the course of studies for the Doyle Drive Project. In 2001, a comprehensive research design and testing plan, as well as an archaeological survey report/historic study report (HSR/ASR) was prepared for the project. Subsequently, a testing program was undertaken in November and December 2001. Test excavations identified the buried remains of a prehistoric shell mound first investigated by L. Loud in 1912 and subsequently designated as CA-SFR-6.

Although no evidence of CA-SFR-26, a single Native American burial that was excavated from beneath a nearby Army building in 1972, was found during the test excavation, an archaeological relationship was determined between CA-SFR-6 and CA-SFR-26. Therefore the boundaries of CA-SFR-6 were expanded to include the plotted location of CA-SFR-26, which is directly adjacent to CA-SFR-6 now referred to as CA-SFR-6/26. CA-SFR-6/26 was evaluated and recommended eligible for listing in the NHRP. The SHPO concurred with this evaluation in correspondence dated December 17, 2002. Additionally, because it has the potential to contain Native American burials, CA-SFR-6/26 may be ascribed other values exclusive of NRHP criteria. If other burials are discovered in this area or elsewhere within the NHLD as a result of the project the requirements of NAGPRA would apply. CA-SFR-6/26 is currently covered with fill to a depth of 1.7 meters (5.6 feet) and is located in an area where impacts can be avoided.

Unknown Historic and Prehistoric Archaeological Resources

The Presidio of San Francisco NHLD documentation identified areas within the Presidio that are considered sensitive for both historic period and prehistoric period archaeological resources. Sensitivity maps for both prehistoric and historic period archaeological resources have been generated to help predict the locations of unknown sites. The areas of prehistoric archaeological sensitivity that are within the Doyle Drive APE include the bluff on the upper Post along and under Doyle Drive, the lower Post along the base of the bluff, the area

around the former historic extent of Crissy Marsh and the areas where Tennessee Hollow and the Crissy Marsh joined prior to development of the Presidio. For example, another prehistoric site (CA-SFR-126) was uncovered during the Crissy Marsh expansion project, suggesting that other prehistoric sites may exist in the APE. These other sites may be individually eligible for the NRHP.

The testing program targeted these sensitive areas as well as the areas sensitive for historic archaeological resources, such as the locations where various historic structures, features, and activity areas were formerly located. However, many areas of the APE could not be test excavated due to a variety of practical constraints, including a high water table, numerous underground utilities, and the prohibition to test under the existing Doyle Drive.

Although the testing program did not identify any significant archaeological properties other than CA-SFR-6/26 in the Doyle Drive Project area, the project area is nonetheless considered sensitive for the presence of historic archaeological sites and features, and therefore, additional measures to locate and treat additional archaeological resources that might be located in the APE are also being considered for implementation in advance of construction. These efforts would be designed to reduce the potential for inadvertent discoveries and also allow for archaeological site avoidance measures where feasible. Even with these measures archaeological discoveries during construction are anticipated.

Presidio Viaduct and Marina Viaduct

The Presidio Viaduct (Bridge 34 0019) and the Marina Viaduct (Bridge 34 0014), the elevated portions of Doyle Drive, were determined eligible for listing in the NRHP in 1987. These two structures are also part of the overall Doyle Drive structure that is a contributor to the Presidio NHL and is considered a contributor to the NRHP eligible Golden Gate Bridge.

Golden Gate Bridge

The Golden Gate Bridge was determined eligible for listing on the NRHP in 1980, and was designated as California State Historic Landmark No. 974 in 1990. As of September 2008, the Golden Gate Bridge has not yet been listed in the NRHP. In 1997, NPS



Doyle Drive with the Golden Gate Bridge in the background.

prepared a NHL nomination for the Golden Gate Bridge. In this nomination, Doyle Drive is recognized as a contributor to the Golden Gate Bridge property, because it is functionally and aesthetically integral to the Golden Gate Bridge. As of September 2008, the Golden Gate Bridge has not been submitted for designation as a NHL.

Palace of Fine Arts

In 2004 the Maybeck Foundation nominated the Palace of Fine Arts for listing in the NRHP. The State Historical Resources Commission approved the nomination at its meeting on February 6, 2004. In December 2005, the Palace of Fine Arts was listed in the NRHP. The Palace of Fine Arts has also been designated San Francisco City Landmark #88 and as such, is also considered an historical resource for the purposes of CEQA.

Temporary Impacts

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

Permanent Impacts

The following section discusses the potential permanent impacts by alternative on cultural resources that may result from the Doyle Drive Project. These impacts include the primary construction activities as well as secondary effects such as impacts to historic buildings from vibration or work in close 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, stockpiling of soil;
- Construction of aerial structures and substructures;
- Construction of tunnels;
- Construction and demolition of temporary detours;
- Removal of vegetation and existing facilities; and
- Erection of temporary bracing and shoring, roadway construction, placement of reinforced concrete and pre-cast concrete, landscaping, and demobilization.

The impacts on cultural resources that could result from the implementation of mitigation of other resources are not included here because the mitigation that would be implemented has not been selected.

Alternative 1: No-Build

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 2: Replace and Widen

The Replace and Widen Alternative, with either the No-Detour or With Detour Option, would cause adverse effects to the Presidio NHLD, as well as to individual historic properties. The Replace and Widen Alternative would adversely affect the Doyle Drive viaducts as historic properties through their removal and replacement with new structures. This alternative would cause a direct adverse effect to the Golden Gate Bridge historic property through the removal of Doyle Drive, which is a contributing element of the bridge property.

Based on available information, the Replace and Widen Alternative would not have an adverse effect on the Palace of Fine Arts property; however, advocates for the Palace have expressed concerns about possible vibration impacts to the buildings and the lagoon. Although the projects meet standards for acceptable vibration in proximity for fragile historic structures, additional vibration testing is planned. Should additional vibration testing demonstrate potential risks to the Palace of Fine Arts, a conditions assessment would be conducted to determine how best to ensure that the property would not be damaged during construction of the project.

The Replace and Widen Alternative – With Detour Option would have no adverse effect with conditions¹³ on the known archaeological site CA-SFR-6/26. If prehistoric or historic period archaeological sites are identified prior to or during construction, then the construction of the Replace and Widen Alternative could adversely affect them.

The Replace and Widen Alternative – No-Detour Option would have a direct adverse effect on the Presidio NHLD by the removal of Doyle Drive, a contributing element to the NHLD, by altering the alignment of some contributing roads, and by the removal of existing cultural landscape features, including trees. The increased width and height of the new structure would also increase the structure's visual presence in areas immediately adjacent to the structure and would alter the integrity of feeling in these areas. Contributing roads affected include Battery Blaney Road, Veterans Boulevard (Route 1/Veterans Boulevard), Lincoln Boulevard, and Crissy Field Avenue.

There would be direct adverse effects to the cultural landscape of the Presidio NHLD under the Replace and Widen Alternative – No-Detour Option due to the alteration or removal of existing cultural landscape features (trees and circulation features) and the addition of new non-historic features into the

¹³ These conditions would include protection measures such as the establishment of an environmentally sensitive area (ESA) to protect the site during ground disturbing activities.

cultural landscape. This alternative would result in the removal of the existing Doyle Drive structure, a historic circulation feature and contributor to the Presidio's historic landscape.

The Replace and Widen - With Detour Option would adversely affect the same resources as the No-Detour Option, plus it would require the removal of Buildings 1182, 1183, 1184, and 1185 (four of the seven Mason Street warehouses),

which are contributing elements to the district. The removal of these warehouses would be temporary as they are expected to be replaced to their original location; however, this action would still be an adverse effect. The removal would also be an adverse effect because it



Buildings 1184, 1183, and 1182, camera facing east.

would cause a loss of integrity of the edge, or boundary, of the northeast corner of the Presidio NHLD. The replacement of these warehouses to their original location after the demolition of the temporary detour structure would mitigate the loss of contributing elements and boundary erosion.

Alternative 5: Presidio Parkway

The Presidio Parkway Alternative (under both the Diamond and Circle Options) would have an adverse effect on the Presidio NHLD, including the cultural landscape, contributors to the NHLD, and to individual historic properties.

Under either option, the alternative would adversely affect the Presidio NHLD by the removal of Doyle Drive. Specifically, the Presidio Parkway Alternative would have a direct adverse effect on the Doyle Drive viaducts through their removal and replacement with new structures. This alternative would adversely affect the Golden Gate Bridge property directly through the removal of Doyle Drive (a contributing element of the bridge property), and indirectly through the introduction of new Doyle Drive structures that are dissimilar to the existing roadway structures.

Based on available information, the Presidio Parkway Alternative would not have an adverse effect on the Palace of Fine Arts property; however, there are

concerns about possible vibration impacts to the buildings and the lagoon. Although the project meets standards for acceptable vibration in proximity for fragile historic structures, additional vibration testing for the Palace of Fine Arts would be implemented to ensure that the property would not be damaged during construction of the project.

The Presidio Parkway Alternative would have no adverse effect on the known archaeological site CA-SFR-6/26 because the site would be designated an environmentally sensitive area to be avoided and protected during construction.

In addition, four buildings that contribute to the Presidio NHLD (Buildings 201, 204, 230, and 670) will be removed to accommodate the project. Buildings 204, 230, and 670 will be deconstructed, as will the ground floor of Building 201. The top floor of Building 201 will be moved, temporarily stored, and returned to its current location following completion of the project. Building 228 would be affected by the raising of Halleck Street on its west side to accommodate the street as it crosses the tunnel, which would affect the setting of this structure. All of these changes to contributing elements would cause an adverse effect to the NHLD.

The Presidio Parkway Alternative (for both Diamond and Circle Options) would cause direct and indirect adverse effects to the cultural landscape of the Presidio NHLD because it would alter or remove existing cultural landscape features (trees, circulation features, topographic features, spatial organization) and would introduce new non-historic features into the cultural landscape.

Of considerable concern are the adverse effects that would be caused by the project to the historic bluff that separates the upper and lower posts. While this topographic feature has been modified throughout the Presidio's history and was substantially altered during construction of existing Doyle Drive, it still remains one of the most important character-defining features in terms of topography for the NHLD. Specifically, the presence of this natural bluff influenced the pattern of development at the Presidio throughout its history. The Parkway Alternative would obscure a considerable portion of the bluff on the east end of the alignment, thus, eliminating an important visual cue that signaled the division between upper and lower posts. Removal of portions of the bluff makes it more difficult to understand how natural features influenced the development of the Presidio. In addition, the introduction of an earth-covered tunnel would add a non-historic topographic feature into the NHLD. Both the loss of portions of the bluff and the introduction of a non-historic topographic feature would adversely affect the NHLD.

Both options under this alternative would adversely affect the Presidio NHLD by altering the alignment of the following contributing roads: Veterans Boulevard, Richardson Avenue, Bank Street, Battery Blaney Road, Marshall Street, Crissy Field Avenue, Girard Road, Halleck Street, Gorgas Avenue, Lincoln Boulevard, and Vallejo Street.

Of these effects to contributing roads within the NHLD, the raising of Halleck Street to accommodate the crossing of the tunnel has the greatest potential for adverse effects on the NHLD. This street is the original route from the upper post to the wharf and it represents an important linkage between these two areas of the Presidio. This route had already been affected by building removals to accommodate the Crissy Marsh expansion, therefore changes to the historic character of the streetscape, including the relationship of the street to Buildings 201 and 228 (which flank Halleck Street), would be adverse because they have the potential to further erode the historic character of the larger historic functional area. In addition, raising the level of the street to cross over the tunnel would result in the loss of a visual connection between the Main Post and the edge of the bay.

The Presidio Parkway Alternative – Circle Option would have all the same adverse effects as described above, and would also have an additional adverse effect on the NHLD resulting from the demolition of Building 1151. The Presidio Parkway Alternative – Hook Ramp Option would also have an additional adverse effect on the NHLD resulting from the alteration of Cowles Street, near Cavalry Stables.

Preferred Alternative: Refined Presidio Parkway

The Preferred Alternative will have an adverse effect on the Presidio NHLD, including the cultural landscape, contributors to the NHLD, and to individual historic properties.

The Alternative will adversely affect the Presidio NHLD by the removal of Doyle Drive. In addition, four buildings that contribute to the Presidio NHLD (Buildings 201, 204, 230, and 670) will be removed to accommodate the project. Buildings 204, 230, and 670 will be deconstructed, as will the ground floor of Building 201. The top floor of Building 201 will be moved, temporarily stored, and returned to its current location following completion of the project. Building 228 will be affected by the raising of Halleck Street on its west side to accommodate the street as it crosses the tunnel, which will affect the setting of this structure. All of these changes to contributing elements will cause an adverse effect to the NHLD.

The Preferred Alternative will also cause direct and indirect adverse effects to the cultural landscape of the Presidio NHLD because it will alter or remove existing cultural landscape features (trees, circulation features, topographic features, spatial organization) and will introduce new non-historic features into the cultural landscape.

Of considerable concern are the adverse effects that will be caused by the project to the historic bluff that separates the upper and lower posts. While this topographic feature has been modified throughout the Presidio's history and was substantially altered during construction of existing Doyle Drive, it still remains one of the most important character-defining features in terms of topography for

the NHLD. Specifically, the presence of this natural bluff influenced the pattern of development at the Presidio throughout its history. The Preferred Alternative will obscure a considerable portion of the bluff on the east end of the alignment, thus eliminating an important visual cue that signaled the division between upper and lower posts. Removal of portions of the bluff makes it more difficult to understand how natural features influenced the development of the Presidio. In addition, the introduction of an earth-covered tunnel will add a non-historic topographic feature into the NHLD. Both the loss of portions of the bluff and the introduction of a non-historic topographic feature will adversely affect the NHLD.

The Preferred Alternative will also adversely affect the Presidio NHLD by altering the alignment of the following contributing roads: Veterans Boulevard, Richardson Avenue, Bank Street, Battery Blaney Road, Marshall Street, Crissy Field Avenue, Girard Road, Halleck Street, Gorgas Avenue, Lincoln Boulevard, Cowles Street, and Vallejo Street. Of these effects to contributing roads within the NHLD, the raising of Halleck Street to accommodate the crossing of the tunnel has the greatest potential for adverse effects on the NHLD. This street is the original route from the upper post to the wharf and it represents an important linkage between these two areas of the Presidio. This route had already been affected by building removals to accommodate the Crissy Marsh expansion, therefore, changes to the historic character of the streetscape, including the relationship of the street to Buildings 201 and 228 (which flank Halleck Street), will be adverse because they have the potential to further erode the historic character of the larger historic functional area. In addition, raising the level of the street to cross over the tunnel will result in a loss of visual connection between the Main Post and the edge of the bay.

The Preferred Alternative will have a direct adverse effect on the Doyle Drive viaducts through their removal and replacement with new structures. This alternative will adversely affect the Golden Gate Bridge property directly through the removal of Doyle Drive (a contributing element of the bridge property), and indirectly through the introduction of new Doyle Drive structures that are dissimilar to the existing roadway structures. Based on available information, the Preferred Alternative will not have an adverse effect on the Palace of Fine Arts property; however, there are concerns about possible vibration impacts to the buildings and the lagoon. Although the project meets standards for acceptable vibration in proximity for fragile historic structures, additional vibration testing for the Palace of Fine Arts will be implemented to ensure that the property will not be damaged during construction of the project.

The Preferred Alternative will have no adverse effect on the known archaeological site CA-SFR-6/26 because the site will be designated an environmentally sensitive area to be avoided and protected during construction. Because the large underground parking facility has been eliminated from the Preferred Alternative, potential impacts to unknown archaeological sites will be less than those identified in the DEIS/R. If prehistoric or historic period

archaeological sites are identified prior to or during construction, then the construction of the Preferred Alternative could adversely affect them.

Comparison of Effects

The completed structures and alignment of the Replace and Widen Alternative (under both No-Detour and With Detour) would more closely resemble the existing Doyle Drive facility and would cause fewer adverse effects than the Presidio Parkway Alternative (all options), especially in terms of both the cultural landscape and contributing elements of the NHLD. The Replace and Widen Alternative would also adversely affect contributing features in geographically smaller areas than the Presidio Parkway Alternative, thus having less impact on the integrity of the NHLD. However, the Replace and Widen Alternative (With Detour Option) would require the removal of Buildings 1182, 1183, 1184, and 1185 (four of the seven Mason Street warehouses), which are contributing elements to the district. The removal of these warehouses would be temporary as they are expected to be replaced to their original location; however, this action would still be an adverse effect. The removal would also be an adverse effect because it would cause a loss of integrity of the edge, or boundary, of the northeast corner of the Presidio NHLD. The replacement of these warehouses to their original location after the demolition of the temporary detour structure would mitigate the loss of contributing elements and boundary erosion.

The Presidio Parkway/Preferred Alternative will cause a number of adverse effects to contributing elements of the NHLD and will alter the cultural landscape of the NHLD. Although considerable effort was made to retain structures, three historic buildings (Buildings 230, 670 and 204) will be demolished, as would the lower story of Building 201. The upper story of Building 201 will be moved, temporarily stored, and then replaced to approximately its original location after project completion. The project also adversely affects the Halleck Street area both in terms of changing the height of the street and thereby diminishing the visual connection between the Main Post and the bay, and by changing the setting of this area, adversely affecting both Building 201 and Building 228 which flank Halleck Street. In terms of effects on the cultural landscape, the Presidio Parkway/Preferred Alternative will obscure or demolish a significant portion of the bluff which defines the upper and lower post areas, thus causing an adverse effect on the Presidio NHLD.

Finally, both alternatives require that the Doyle Drive viaducts be demolished to make way for the project. These viaducts are individually NRHP eligible, and are contributors to the Presidio NHLD and the Golden Gate Bridge property, thus their demolition will also adversely affect the NHLD and the Golden Gate Bridge.

Although considerable effort was made to identify archaeological resources during the planning stages of the project, both alternatives have the potential to equally adversely affect unknown prehistoric and archaeological resources during construction.

In summary, although considerable effort was made to retain historic structures, both alternatives will cause adverse effects to the Presidio NHL. The Preferred Alternative/Presidio Parkway Alternative will require that three historic buildings be permanently removed and one historic building be removed and partially returned to its original location to accommodate construction. The Replace and Widen Alternative would require that four historic buildings be removed to accommodate construction, although they would be removed, stored, and then returned to their original location. The Presidio Parkway Alternative would cause greater impacts to the cultural landscape than the Replace and Widen Alternative due to the need to build a tunnel that would substantially affect the bluff that separates the upper and lower posts.

Avoidance, Minimization, and/or Mitigation Measures

This avoidance, minimization, and/or mitigation measures discussion focuses primarily on the Preferred Alternative because both the PA and cultural resource treatment plans focus solely on the Preferred Alternative. The San Francisco County Transportation Authority (the Authority), Caltrans, and FHWA are working closely with the SHPO, the Presidio Trust, the National Park Service, the ACHP and other interested parties to ensure appropriate measures are developed and implemented. The *Archaeological Treatment Plan* will describe the procedures that will be followed to ensure that the one known archaeological site (CA-SFR-6/26) is protected and how any inadvertent discoveries of archaeological sites will be addressed. The *Built Environment Treatment Plan* will describe how effects to buildings and the cultural landscape will be addressed.

The treatment plans will be completed by the end of November 2008 in advance of the ROD and attached to the executed PA.

Archaeological Protection Monitoring, Discovery, Evaluation, and Treatment Plan

An *archaeology monitoring, discovery, evaluation and treatment 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-6/26) and to address the potential for discovery of unknown archaeological resources. A professional archaeologist who meets the Secretary of the Interior's *Professional Qualifications Standards* (48 FR 44738-9) will prepare the plan and monitor all pre-construction and construction activities in the project area.

The plan will be consistent with the Secretary of the Interior's *Standards and Guidelines for Archaeological Documentation* (48 FR 44734-37) and take into account the Council's publication, *Treatment of Archaeological Properties: A Handbook* (ACHP 1980), and SHPO guidelines. Specifically, the plan will specify the process and schedule for conducting evaluations in areas within the APE, including where additional subsurface exploration is to be carried out; the methods, locations, and schedule for subsurface exploration; and the methods that will be used to determine whether archaeological properties are significant. It will also outline the process and schedule for conducting data recovery for significant resources found in the APE, including the research questions to be addressed through data

recovery; the methods to be used in analysis, data management, and dissemination of data; and the methods to be used for data recovery, with an explanation of their relevance to the research questions. The plan will outline the procedures that will be followed in the event of an unanticipated archaeological discovery. The plan will also describe proposed curation of recovered materials and records (see Collections Management/Curation below), and the proposed methods for disseminating results of the work. The plan will also outline the process by which interested Native Americans from the Ohlone community will continue to be consulted. The plan will also outline how the project will comply with the *Native American Graves Protection and Repatriation Act* (NAGPRA) if Native American human remains are encountered during the course of the project.

Built Environment Treatment Plan

The *Built Environment Treatment Plan* (BETP) is being developed with input from the responsible agencies as well as interested parties. It will dictate a variety of tasks intended to avoid, minimize, or mitigate for impacts to the built environment. The plan outlines the following requirements:

Develop Architectural Criteria

Caltrans and SFCTA, in consultation with the Trust and NPS, will prepare architectural criteria that will be utilized, where feasible, in the design process for the project. The criteria will identify design elements for the new facility that are reminiscent of historic character-defining features while integrating the roadway into the Presidio NHLD landscape. The results of the process will be incorporated into the BETP and will influence the project design as appropriate.

Conduct Vibration Studies

Prior to the commencement of any construction activity, a structural engineer will be retained who has experience working with historic buildings to assess and evaluate the stability of Building 106 and the Palace of Fine Arts pond because there is a potential for construction vibration to affect these properties. In order to determine the potential for vibration impacts, Caltrans and SFCTA, working with the consulting parties, will use existing vibration analysis to establish the level of additional analysis needed, including number and placement of receptors and their monitoring requirements. Additional studies, including in-situ testing, will be conducted as indicated. The results of these studies will inform any additional mitigation requirements, such as changes in construction methodology, shoring, and building stabilization.

Recordation

Prior to the commencement of deconstructing Buildings 201, 204, and 230, the demolition of Building 670 and Doyle Drive, excavation within the Presidio historic landscape, as well as any construction within the vicinity of Buildings 106 and 228, recordation documentation of these resources will be conducted in

accordance with the *Historic American Building Survey/ Historic American Engineering Record/ Historic American Landscape Survey* (HABS/HAER/HALS). In addition, seven areas of the Presidio NHLD will be subjected to HALS documentation including the Batteries, Bluff, Stable Area, Quartermaster Area, Gorgas Warehouse Compound, streetscapes, and landscapes totaling about 115 acres directly impacted along the Doyle Drive corridor.

The NPS HABS/HAER/HALS program will be consulted to determine the level and kind of recordation appropriate for each contributing resource. Archival, digital and bound library-quality copies of this documentation will be developed and made available, as appropriate, to the SHPO, Caltrans, the Trust, and NPS/GGNRA Park Archives and Records Center. Other interested parties and repositories will be identified and the documentation will be distributed to them as appropriate.

Recordation/documentation methods in addition to, or other than, HABS/HAER/HALS may also be appropriate and could be proposed as mitigation for the project during the development of the cultural resources treatments plans which will be completed in Fall 2008.

Preparation of Historic Structures Reports and Conditions Assessments

Historic Structure Reports (HSRs) will be prepared for each historic property or contributing building within the Presidio NHLD that will be affected by the project but are not to be demolished. HSRs will be prepared for Buildings 106, 201, 228, 229 and 1167. These buildings are not expected to be adversely affected by the project, but detailed information is needed to assess what avoidance and protection measures are required to prevent adverse effects. The HSRs will 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 will 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.

Thirty-eight buildings and structures that are in close proximity to the construction area, for which no construction impacts are anticipated, will undergo a *Pre-Construction Condition Assessment* as a precautionary measure and to provide a baseline for a post-construction assessment. The assessment procedures will focus on conditions of exterior elements, character-defining features in particular, and overall structural conditions. Written assessments will be accompanied by digital photo documentation and field drawings. The assessment will also provide information to determine best protection practices during construction for each of the assessed buildings, and result in the preparation of a field document for the architectural monitor to review the

efficacy of the protective measures during construction activities in proximity of the buildings.

Stabilization /Monitoring /Security During Construction

Based on information from the *Historic Structure Reports*, before the construction phase of the project, a comprehensive stabilization/monitoring plan will be prepared. This plan will cover all potentially affected contributing elements, including historic structures and cultural landscape elements. This plan will present a detailed methodology for the protection of historic properties, such as buildings, structures, objects, and sites, including cultural landscape elements, within the project area that are in close proximity to construction activities. This plan will describe methods for the preservation, stabilization, shoring/underpinning, and monitoring of buildings, structures, and objects. The plan will also include provisions that high vibration construction techniques will be avoided in sensitive areas.

It is anticipated that approximately 38 buildings will be subject to stabilization, monitoring, protection, and security procedures during the course of the project. Underpinning and/or other stabilization and protective methods will 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 Code of Federal Regulations Part 61*) will approve and monitor underpinning and stabilization activities. These same buildings will also require pre- and post-construction condition assessment reports.

Appropriate steps will also be taken to ensure that buildings will be protected prior to moving, deconstruction, or demolition to accommodate construction. Building 201 will be protected in place until its upper story is temporarily relocated and its lower story is deconstructed. Measures taken for Building 230 will include securing the building after it is vacated and providing security throughout the period of vacancy prior to deconstruction. Buildings 204 and 670 are currently vacant and will likely remain so until Building 204 is deconstructed and 670 is demolished. These provisions will be outlined in the BETP in consultation with the NPS and Trust Federal Preservation Officer (FPO), and will follow recommended standards established in NPS' *Preservation Brief 31: Mothballing Historic Buildings Measures for the Removal and Temporary Preservation of Historic Properties*.

Public interpretive material will be developed commensurate with the significance themes for the resources affected by the project. The *Architectural Treatment Plan* and BETP will present synchronized plans including the types of public and scholarly interpretation that will be implemented. Interpretive products will include the brochures, signage and panels, and other appropriate media for interpretation. The interpretation plans will also outline the locations where such interpretation would be installed or take place and identify any

interpretation that might be needed prior to and during construction to educate Park visitors about the cultural resources protection measures being undertaken. These will in part be informed by the findings of fieldwork such as HABS/HAER/HALS recordation and archaeological monitoring. The interpretive objectives for mitigating effects to historic resources will be coordinated with the Presidio Trust's interpretive program and methodologies.

Materials that are developed as a part of mitigation for effects by this project on cultural resources will be digitized and provided to the Presidio Trust collection in electronic form. Materials will be disseminated to appropriate repositories such as the San Francisco Public Library, San Francisco Architectural Heritage, Golden Gate National Recreation Area (GGNRA), Caltrans District 4, Caltrans Transportation Library in Sacramento, and the Golden Gate Bridge Highway and Transportation District.

Relocation

After recordation in accordance with HABS/HAER/HALS documentation, the top half of Building 201 will be deconstructed, moved, and stored to the extent feasible 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 the top floor of Building 201 will follow the approach outlined in *Moving Historic Buildings* (John Obed Curtis, 1979, American Association for State and Local History) and will adhere to the recommendations outlined in the feasibility report prepared for Buildings 201, 204 and 228 (Garavaglia 2007). In addition, Building 201 will be relocated by a professional mover with demonstrated experience in the successful movement of historic buildings. These efforts will be conducted in consultation with the Trust.

Alteration of Buildings

Halleck Street will be raised resulting in adverse affects to the setting of Building 228. For Building 228, the effects of raising Halleck Street adjacent to the building will be minimized by implementing design treatments, detailed in the BETP, for the sidewalk and retaining walls where the building and Halleck Street connect. This treatment will address the impact of having the ground level of Building 228 at a considerably lower elevation than Halleck Street post-construction.

Architectural Resource Protection Measures and Cultural Landscape Monitoring

Protection measures, such as environmentally sensitive area (ESA) fencing, will be used to protect known resources during construction. These measures will be implemented for contributing elements of the Presidio NHL, including buildings and historic landscaping that are in close 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 the BETP will

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 Presidio NHLD will be conducted in proximity to the project to support the protection measures for the built environment and the cultural landscape. Monitoring protocols, which will be detailed in the BETP, will include the location, frequency, and duration of monitoring for each resource type. Monitoring procedures will commence with pre-construction condition assessments of buildings and structures adjacent to the construction footprint in order 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 the BETP will be followed in consultation with the Trust FPO, NPS-GGNRA staff, the SHPO, and ACHP.

This monitoring will 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 the upper story of Building 201, and rehabilitation and/or restoration of cultural landscape features will be conducted in consultation with the Trust and will follow the Secretary of the Interior's *Standards for the Treatment of Historic Properties: Standards for Preservation, Rehabilitation, Restoration, and Reconstruction* (1995) and NPS Preservation Brief 36, *Protecting Cultural Landscapes: Planning, Treatment, and Management of Historic Landscapes*.

Only portions of the Presidio's 1,491 acre cultural landscape will be affected by the project. Therefore, only specific areas, or sub-areas, of the larger cultural landscape will be subject to treatment as part of the mitigation measures for the project. The total area of the Doyle Drive construction corridor is approximately 115 acres. Approximately 86 acres is covered with buildings, roads, paved areas and ornamental landscape, lawn, isolated trees and shrubs. The remainder of the construction corridor is covered with vegetation, most of which has been designated as historic and contributors to the NHL. These areas will be defined in detail in the BETP. Replanting will require coordination with natural resource restoration prescriptions, Caltrans landscape protocols, erosion control engineering, and the Trust's *Vegetation Management Plan*.

To the extent feasible the effects of reconstructing portions of streets contributing to the Presidio NHLD will be minimized. In particular, Halleck Street, which is being raised to accommodate the new Doyle Drive, will be reconstructed to minimize visual effects where adjacent to Building 228. The walkway by the building will be reconstructed at the same elevation as the

building in order to minimize the appearance of the building having sunk into the streetscape. Buildings, structures, objects, and sites that are contributors to the Presidio NHL that were not to be demolished, but are inadvertently damaged, will also be restored in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties: Standards for Preservation, Rehabilitation, Restoration, and Reconstruction* (1995).

Minor Repairs and Reconstruction

Inadvertent damage to historic properties, or to their contributing elements, will 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 will include damage to contributing elements such as landscaping, curbs, fencing, and related features, as well as contributing buildings, structures, and objects.

Salvage

Buildings 204 and 230, and the lower story of Building 201, will be deconstructed and the materials salvaged in consultation with the Trust FPO and in accordance with the *Presidio Trust Policy for Waste Minimization in Construction and Demolition*. At a minimum, all historic elements identified by the Trust FPO as being desired for preservation and/or reuse will be salvaged. Salvaged materials will include such elements as structural members, siding, windows, hardware, lighting and plumbing fixtures, and all such items that might be used in preserving and repairing other buildings of a similar vintage and construction. Salvaged materials will be transported and transferred to the responsibility of the Trust at a location to be designated by the Trust FPO and the Trust salvage coordinator. Materials that are salvaged will be documented and cataloged as part of the salvage process. Where feasible, historic vegetation will also be salvaged. Excavation for the Doyle Drive Project may also uncover historic hardscape, such as paths and stairways. Material such as brick and cobblestones will also be subject to recordation and salvage. This mitigation will be coordinated with monitoring measures defined in the *Architectural Treatment Plan*.

After Doyle Drive has been recorded in accordance with the appropriate level of documentation as determined by the NPS program of the HAER, all elements identified by the Golden Gate Bridge Highway and Transportation District as being desired for preservation and/or reuse will be salvaged. Because Doyle Drive will continue to be used by the traveling public, and the light standards, a contributing element of Doyle Drive, continue to deteriorate, they will be replaced on an as needed basis as public health and safety require, prior to the demolition of the facility. Because any removed standards will be considerably deteriorated, they will not be offered to the Golden Gate Bridge Highway and Transportation District, but will be disposed of properly.

Conduct Post-Construction Condition Assessment, and a Re-evaluation of Resources

Following completion of construction of the new Doyle Drive, a post-construction conditions assessment and re-evaluation will be conducted pursuant to NRHP criteria, of specific buildings that were previously identified as contributors to the Presidio NHLD and portions of the cultural landscape of the Presidio NHLD to assess whether they still retain sufficient historic integrity to convey their significance.

National Historic Landmark Nomination for the Golden Gate Bridge

An NHL nomination was originally prepared by the National Park Service for the Golden Gate Bridge in 1997, but to date, the bridge has not been so designated. Current seismic reinforcement carried out by the Golden Gate Bridge Highway and Transportation District, in addition to the replacement of the contributing Doyle Drive, will have altered this property, necessitating that the contributing elements be redefined for it to be nominated as a NHL. Following completion of construction of the new Doyle Drive, the NHL nomination form will be updated and submitted to the National Park Service.

Collections Management /Curation

The treatment plans will establish a comprehensive collection program which will be implemented as part of the project for materials discovered during excavation, as well as for records created in support of historic preservation efforts. The program will include a complete collections management protocol that will include accessioning and cataloging, curatorial and preservation treatment, and disposition of these materials into a collections management facility designated by the Trust. This program will be developed in consultation with the Trust FPO.

3.3 Physical Environment

This section discusses six resource areas which are typically characterized as part of the physical environment. These resource areas are:

- hydrology, water quality, and stormwater;
- geology/soils/seismic/topography;
- hazardous materials;
- air quality;
- noise and vibration; and
- energy.

3.3.1 Hydrology, Water Quality, and Stormwater

This section discusses water quality, stormwater and hydrology in the Doyle Drive Project study area. Water quality relates to the chemical, physical, and biological characteristics of water with respect to its suitability for a beneficial use. Good water quality is essential in maintaining human health, wildlife habitats, and vegetation. Roadway projects can affect water quality because increased impervious surfaces lead to changes in hydrology and affect surface runoff that drains to streams and natural habitats.

Information for this section has been extracted from the *South Access to the Golden Gate Bridge: Doyle Drive Project Revised Hydrology and Water Resources Technical Report*, October 2004.

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 the Biological Section of this document.

The *National Pollutant Discharge Elimination System* (NPDES) permit program was established through the *Clean Water Act*. The main purpose of the NPDES program is to regulate discharges to surface waters. NPDES permits regulate stormwater runoff both during and after construction. The main objective is to minimize the amount of pollutants in stormwater runoff and non-stormwater discharges (e.g., truck wash water) in order to improve the quality of receiving waters. The NPDES program is largely implemented by state and local agencies.

The State Water Resources Control Board and Regional Water Quality Control Board regulate water quality in surface and groundwater bodies in California. The project study area is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (SFRWQCB), which is responsible for

implementation of state and federal water quality protection laws and regulations. The SFRWQCB prepared, adopted, and implements the *Water Quality Control Plan, San Francisco Bay Basin (Basin Plan)*, which is the master policy document for managing surface and groundwater quality issues in the region. The SFRWQCB has been consulted on a variety of issues associated with this project during project planning and implementation of field studies.

The State Water Resources Control Board and the SFRWQCB issue permits that implement the standards included in the *Basin Plan* and other requirements of the *State Water Code* and the *Federal Clean Water Act*. The Board also implements the NPDES program.

Non-Caltrans projects within the Presidio disturbing more than 0.4 hectare (one acre) of land during construction are required to file a *Notice of Intent* (NOI) with the SFRWQCB to be covered under the State *NPDES General Construction Permit* for discharges of stormwater associated with construction activity.

Discharges from Caltrans roadway facilities are regulated by an *NPDES Statewide Stormwater Permit*. The permit applies to construction project activities resulting in soil disturbance of more than 0.4 hectares (one acre). The permit requires Caltrans to maintain an effective *Stormwater Management Plan* (SWMP). Caltrans uses the approved SWMP to guide treatment of stormwater runoff both during and post construction. Caltrans is required to perform compliance monitoring (also referred to as self-audits) of the stormwater program each year to determine if the program is being implemented as required by their NPDES Permit.

Wastewater from the Presidio is treated at the San Francisco Public Utilities Commission Southeast Water Pollution Control Plant and the Oceanside Water Pollution Control Plant. The intent of the water recycling is to reuse wastewater for landscape irrigation and to reduce Presidio wastewater flows entering the city and county of San Francisco combined sewer system.

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* and Low Impact Development (LID) technologies for managing stormwater runoff. LID directs runoff to natural vegetated systems, such as landscaped strips and swales that reduce, filter or slow stormwater runoff, to help mitigate the impacts of impervious surfaces (<http://sfwater.org>).

National Park Service and Presidio Trust Water Resources Policies

The National Park Service (NPS) and the Presidio Trust provide additional emphasis on water resources. While there are no existing national or state water standards that are specific to the Presidio or national parks, the following lists the titles of existing policies set forth in Director's Orders and Executive Orders

(which apply to FHWA) which provide general policy direction in promoting floodplain and wetlands management:

- *Executive Order No. 11988* - Floodplain Management; and
- *Executive Order 11990* - Protection of Wetlands.

Tennessee Hollow Restoration

The vast majority of the Tennessee Hollow watershed is within the planning jurisdiction of the Presidio Trust (Trust). The Trust's adopted land use plan – the *Presidio Trust Management Plan* (PTMP) (2002) – acknowledges the rich ecological and cultural values of this area of the Presidio and calls for its restoration, protection, and interpretation. In broad terms, the PTMP directs the Trust to:

“Restore a functioning stream ecosystem with associated riparian and wetland habitats; improve the quality of freshwater flows into Crissy Marsh; improve management practices in the surrounding watershed; protect and enhance cultural and archeological resources; provide recreational, educational, and interpretative opportunities; and adapt existing infrastructure to support the restoration.”

Restoration of the Tennessee Hollow is a project that would be implemented by the Trust.

The *Presidio Trust Management Plan* also states:

“Rehabilitate and enhance natural water resources. Manage on-site water resources to protect ground and surface water, natural wetland and riparian habitat, and water supplies for the Presidio community. Protect important native geologic and soil components.”

Affected Environment

This section summarizes the existing hydrologic conditions within the Doyle Drive Project study area.

Climate and Physiography

Hydrology within the project study area is directly related to climate (rainfall) and physiography (topography and geologic deposits). The climate is characterized as ‘Mediterranean’, with cool, wet winters and relatively warm, dry summers. The mean annual rainfall in the vicinity of the project site is approximately 50 centimeters (20 inches). Analysis of long-term precipitation records indicates that wetter and drier cycles, lasting several years, are common in the region. Severe, damaging rainstorms occur about once every three years.

The topography within the Presidio is variable, ranging from relatively flat coastal plain near sea level along the western and northern shorelines to approximately 120 meters (400 feet) in the south-central hilly uplands. Prior to the placement of fill in the early 1900s, the north coastal lowlands (now known as Crissy Field

and Marina Green) included a back dune marsh system with salt marsh, mudflats, sandflats, subtidal channels, and sand dunes. The western coastal area is characterized by steep rocky bedrock slopes and outcrops of Franciscan Assemblage rocks, including sandstone, shale, chert, and serpentinite. The inland portions of the site consist mainly of gently sloping hills, with several relatively large flat areas in the eastern portion of the site where most of the Presidio buildings are located.

Existing Watershed Basins and Drainages

There are three main watersheds within the Presidio comprising an area of approximately 550 hectares (1,360 acres). These watersheds are:

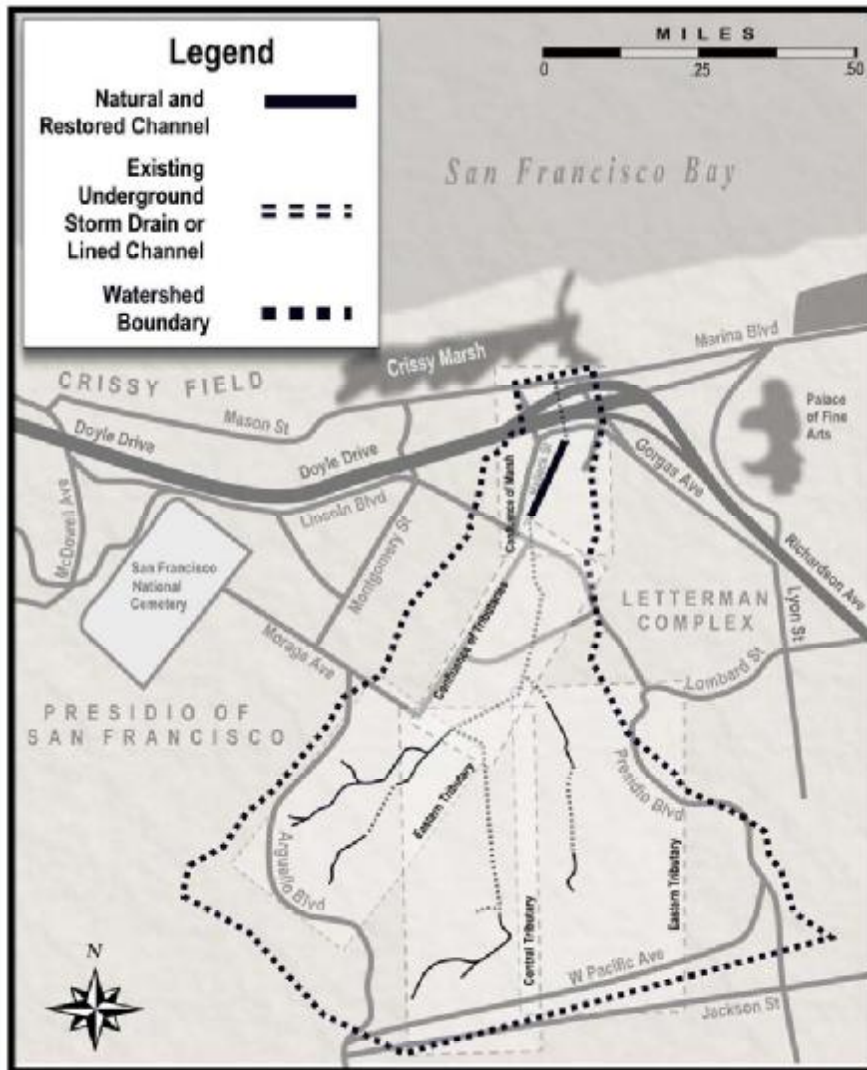
- Lobos Creek watershed;
- Western Coastal watershed; and
- San Francisco Bay watershed, including the Fort Scott and Tennessee Hollow sub-watersheds.

The Lobos Creek watershed (approximately 111 hectares [275 acres] total area) and the Western Coastal watershed (approximately 85 hectares [210 acres] total area) drain to the Pacific Ocean and are not directly affected by the proposed project as the Doyle Drive alignment does not cross the basin boundaries. Therefore, the Lobos Creek and western coastal watersheds are not further discussed.

The largest of the Presidio drainage basins in the San Francisco Bay watershed is the Tennessee Hollow watershed.¹⁴ It consists of approximately 113 hectares (278 acres) of various land uses, including open space, residential, commercial, industrial, and institutional. Natural drainage features within the more developed urban-type areas have been largely eliminated and/or altered by past grading, filling, and construction activities, leaving only a few isolated segments of riparian corridor. Most of the drainage in the urban areas now occurs through the Presidio storm drain system in underground pipes and open channels along roads (See **Exhibit 3-47**).

¹⁴ In the vicinity of the project alignment, the other drainage basins are generally modified and consist of underground pipe networks, catch basins, and culverts.

Exhibit 3-47
Tennessee Hollow Watershed



There are no open channel creeks or streams that cross the current Doyle Drive alignment. The storm drain system, built mainly by the U.S. Army, was constructed over many decades. The drainage system was constructed with a variety of materials, including wood, clay, brick, rock, concrete, stone, corrugated metal, and steel. Portions of the Tennessee Hollow drainage system have been identified by the Trust and NPS for future restoration to a natural stream and riparian corridor. Planning for the restoration process has begun, but no specific design has been developed.

The Tennessee Hollow watershed contains three creek tributaries; two of the three tributaries experience year-round flows (the Central/El Polin Springs and Eastern Tributaries), while the third – the Western Tributary – is intermittent, flowing only during precipitation events. The characteristics of these streams have been substantially altered in the past by the construction of roads and buildings, placement of fill, planting of the historic forest, and other removal or alteration of vegetative cover.

Today, the Tennessee Hollow watershed is covered by approximately 19 hectares (46 acres) of impervious surfaces (i.e., roads, parking lots, and buildings). More than half of the creek system has been diverted into storm drains or lined concrete channels. Although there have been substantial changes to the creek system, small pockets of remnant creek and associated wetland habitat remain. These areas support some of the most biologically abundant and diverse wildlife habitat at the Presidio.

Crissy Marsh, at the downstream end of the Tennessee Hollow watershed, is also being studied and at some time in the future Crissy Marsh may be expanded by the Trust, NPS and Golden Gate National Parks Conservancy. The *Crissy Marsh Technical Study* – a technical study examining the health and function of the marsh – was completed and the results presented to the public at a workshop in the Spring 2004. The Trust, NPS, and the Golden Gate National Parks Conservancy are currently planning for a public planning/NEPA process for the Quarter Master Reach Restoration project, which would evaluate a full range of options for the long-term health and viability of the marsh.

The Doyle Drive alignment crosses the Tennessee Hollow drainage just south of the recently restored Crissy Field Marsh and within the area being considered for marsh expansion. Therefore, depending on which alternative is selected, it is possible that the proposed project could affect hydrology and water quality within the watershed and marsh.

Existing Hazards

With its location adjacent to the San Francisco Bay, the project study area may potentially experience various coastal hazards such as tsunamis, extreme high tides, or sea level rise. Neither the project site, or the city and county of San Francisco is included in the Federal Emergency Management Agency's (FEMA) regional flooding hazards mapping program. Areas subject to flooding during the 100-year storm event, if any, have not been delineated within the Presidio by FEMA.¹⁵ No other sources of floodplain data for the project site have been identified. The federal *Executive Order on Floodplains* (EO 11988) requires that proposed federally-funded projects that could affect established floodplains be evaluated and impacts minimized. The alignment is not located in the floodplain that is associated with extreme high tides (described further below). Notably, the

¹⁵ In addition, the U.S Army Corps of Engineers was contacted to determine whether the Corps had completed a floodplain delineation for the Presidio. No record of a Corps floodplain delineation was identified.

current Doyle Drive alignment has not experienced flooding problems during historic severe storm events.

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 [six feet] National Geodetic Vertical Datum of 1929 [NGVD]). Based on the 129-year record of daily high tide, the U.S. Army Corps of Engineers (USACE) has developed an estimated 100-year high tide elevation for various locations in the Bay (an extreme high tide with the probability of occurrence once every 100 years). The elevation of the adopted 100-year tide at the project site, according to the USACE's, *San Mateo and Northern Alameda Counties Interim San Francisco Bay Shoreline Study* (September 1989), is approximately 1.83 meters (six feet) above NGVD. Converted to the more modern North American Vertical Datum of 1988 (NAVD), the elevation of the extreme high tide is 2.6 meters (8.5 feet). Under existing conditions, 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).

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 (100 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 adjacent to the project site has been estimated to range between 2.4 and 2.5 meters (7.8 and 8.2 feet) NGVD for the 100-year tsunami. Converted to NAVD, the predicted wave run-up is 3.2 meters (10.5 feet).¹⁶

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 the U.S. Environmental Protection Agency (EPA), the expected total sea level rise at the project site would be 16 centimeters (six inches) by the year 2050 and 37 centimeters (15 inches) by the year 2100 (EPA 1995). More recent data provided by the California Environmental Protection Agency is consistent with the EPA predictions (Cal EPA, 2006).

¹⁶ Houston, J.R., Garcia, A.W., 1975, *Type 16 Flood Insurance Study: Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound*, Technical Report H-75-17, November.

Those portions of the project study area below the extreme high tide or tsunami wave run-up elevations may experience flooding if one of these events occurs.

Groundwater Resources

Groundwater occurs in the geologic materials underlying the project corridor. The quantity and quality of groundwater are highly dependent on the type, thickness, and configuration of the geologic materials present. In addition, the historic land uses within the Presidio (including placement of artificial fill and releases of hazardous substances) have affected groundwater quality in some limited areas. The bedrock in the area is highly folded and faulted, resulting in irregular saturated veins within the fractured rock. Throughout the study area, unconsolidated sediment and soil material overlie the bedrock and consist of sand deposits, with lesser amounts of silts and clays (this geologic unit is referred to as the Colma formation). Artificial fill has been placed in many of the low-lying areas of the Presidio, including the areas now known as Crissy Field, Marina Green, and Tennessee Hollow. The fill is composed of on-site soil, Bay Mud, sand, and of construction debris (brick, mortar, road base, concrete, and metal). Groundwater occurs in the overlying unconsolidated sediments (and fill), at depths ranging from near the surface (at El Polin spring) to greater than 15 meters (50 feet) below the surface in the hilly uplands. Depth to groundwater in the Crissy Field area (near Mason Street), which generally flows north toward the bay, is typically about 1.5 meters (five feet) below the ground surface (bgs).¹⁷

Numerous seeps and springs occur on the slopes and along the base of the eastern bluffs north of the San Francisco National Military Cemetery, between McDowell Avenue to the west and the eastern edge of the cemetery to the east. The slopes of the bluffs support a variety of native and non-native vegetation that is dependent on high moisture and/or saturated conditions. Springs in the upland areas of the Presidio also feed each of the eastern and central tributaries within the Tennessee Hollow drainage system.

According to the San Francisco Water Department, *San Francisco Groundwater Master Plan of 1996*, the Doyle Drive Project alignment overlies the Marina Groundwater Basin. The Marina Basin has low development potential (due to the high subsidence potential) and unknown water quality.

Water Quality

Review of water quality includes surface water, as well as groundwater. The following discussion summarizes these resources.

Surface Water

Data on surface water quality in the project area are limited. A previous study analyzed the chemical content of samples collected from runoff in the storm drainage system (Dames and Moore, 1994). The analysis found elevated concentrations of biological oxygen demand, chemical oxygen demand, certain

¹⁷ Dames and Moore, 1995, *Wetland and Riparian Corridor Feasibility Study, Presidio of San Francisco*.

metals, and oil and grease in runoff from the industrial/urban areas of the Presidio (Dames and Moore, 1994). The industrial areas sampled as part of the *Presidio Stormwater Management Plan* included the parking area northwest of Building 979 and the north side of Doyle Drive near Building 610.

As part of the effort to gather data for the restoration of Tennessee Hollow, data on water quality parameters (temperature, specific conductance, and pH) of surface water flows at various locations in the Tennessee Hollow watershed were collected. The *Draft Final Hydrologic Monitoring Report* for the Tennessee Hollow Riparian Corridor Restoration Project was issued in March of 2003. Evaluation of the results indicates a wide range of values and that the character of the surface water is influenced by the quantity of flow in the stream.

Groundwater

Three distinct groundwater basins underlie the Presidio: Lobos Creek, Coastal Bluffs, and the Marina basin. The Marina basin (which largely coincides with the San Francisco Bay watershed area) is the basin that could be affected by the Doyle Drive Project. The Lobos Creek and Coastal Bluffs basins are not crossed by the project alignment (except a small segment of the south approach to the Golden Gate Bridge which crosses the Coastal Bluffs basin), and are not further discussed.

According to the San Francisco Water Department's, *San Francisco Groundwater Master Plan* (1996), the Marina basin's aquifer is thin, with a high potential for subsidence (if groundwater were to be extracted), and largely of unknown water quality. For these reasons, use of the aquifer as a drinking water resource is limited. In the vicinity of Crissy Field, tidal effects appear to be limited to the near-shore areas. A 1995 study which predates construction of Crissy Marsh,¹⁸ evaluating the tidal effect on groundwater level fluctuation determined that, at 150 meters (500 feet) from the shore, tide-related oscillations in groundwater level were less than 15 millimeters (0.6 inches). Saltwater intrusion into shallow groundwater underlying the Presidio appears to be restricted to the near-shore areas. Several wells located in the Crissy Field area (ranging from 45 to 170 meters [150 to 550 feet] from the shore) indicate that levels of total dissolved solids and chloride are nearer to fresh water than seawater. Discussion of hazardous materials and remediation sites is provided in Section 3.3.3, Hazardous Waste/Materials, of this environmental document.

Temporary Impacts

This section describes potential temporary impacts of the build alternatives that would occur during construction. Because the No-Build Alternative would not involve any construction activities, it is not being discussed.

¹⁸ Dames and Moore, 1995, *op.cit.*

Construction Dewatering

The construction of any build alternative will require excavation below the ground surface for tunnel construction and/or 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 is generally adequate for discharge of the water without pretreatment, other than settling suspended sediments. However, permits for discharging waters to sewers or surface waters will require characterization of the chemical quality of the effluent and identified contaminants will likely require treatment prior to discharge. The Caltrans statewide permit allows the discharge of non-contaminated construction dewatering in conformance with *Stormwater Management Plan* (SWMP) procedures. Although existing groundwater quality data do not indicate that groundwater in the vicinity of the bluffs tunnel is contaminated, it is possible that unidentified contaminants are present. If contaminants are present in dewatering effluent at levels that could cause environmental harm (i.e., at levels exceeding *Basin Plan Water Quality Objectives* or other applicable water quality criteria), measures will be implemented to either remove the effluent entirely or to examine the use of treatment measures to remove pollutant loads such that the effluent is within acceptable threshold limits for discharge to a treatment facility.

Construction Stormwater Runoff

The build alternatives will involve roadway construction, including excavation, grading, stockpiling of soil, and reconstruction of existing facilities involving removal and replacement of earthen materials. Runoff generated during rainstorms may result in erosion of exposed soil and stockpiled soil. Sediment transported by runoff may cause sedimentation in downstream drainages and/or the sewer system. The accumulation of sediment may result in blockage of flows, potentially resulting in localized ponding or flooding and impacts to aquatic habitat. In addition, it is possible that suspended sediment may affect aquatic biota in receiving waters.

Under existing conditions, the majority of runoff generated from the project site flows to San Francisco Bay (either directly or through Crissy Marsh) through stormwater sewers or as overland flow, particularly during large storms. During construction, sediment may be transported by the runoff and discharged into the Bay, resulting in water quality degradation. However, the Caltrans statewide permit requires control of sediment in construction site runoff and adverse impacts are not expected given that Caltrans will prepare and implement the required *Stormwater Pollution Prevention Plan* (SWPPP). The SWPPP would identify potential pollutant sources that may affect the quality of runoff and identify and require construction and implementation of stormwater pollution prevention measures, referred to as *Best Management Practices* (BMPs). BMPs are designed to reduce pollutants in stormwater discharges from the construction site.

Permanent Impacts

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).

Alternative 1: No-Build

Under existing conditions,¹⁹ Doyle Drive's total amount of impervious roadway (catchment) area (within the project study area) is approximately 41,800 square meters (450,000 square feet). This area would not change under the No-Build Alternative.

Alternative 2: Replace and Widen

Under the Replace and Widen Alternative, the area of the Doyle Drive catchment would increase to 66,000 square meters (710,000 square feet). This alternative drastically increases the volume of roadway runoff. The pollutant loading would likely be similar to the No-Build Alternative for most pollutants. Pollutant loading is mostly affected by increased traffic. This project is not likely to increase traffic compared to existing conditions.

Alternative 5: Presidio Parkway

Under the Presidio Parkway Alternative, the catchment area would also increase, but only slightly relative to the No-Build Alternative. The catchment area for this alternative would be 45,200 square meters (486,300 square feet). However, given that approximately 25 percent of the planned roadway would be in tunnel segments, the approximate total area of impervious surface subject to stormwater runoff is 33,900 square meters (364,764 square feet). The two tunnel segments would be covered with an adequate soil depth to provide infiltration of precipitation (areas over the tunnels would not be considered impervious).

The Presidio Parkway Alternative would result in the reduction of total runoff volume and would also likely result in a reduction of pollutant loading associated with the roadway (relative to the No-Build and Replace and Widen Alternatives since approximately 25 percent of the roadway under the Parkway Alternative would be in tunnel segments, and therefore, not subject to stormwater runoff). This assumes that any residual water collected within the tunnel during storms or during washdown (cleaning the tunnel) activities is contained.

Pollutants deposited in the tunnels are more likely to be removed by sweeping and other cleaning operations than pollutants deposited on open roadways. In addition, fewer pollutants from aerial fallout would be present in the tunnels. The volume of stormwater that is collected in the tunnel sumps would be of much lesser volume than that of a similar sized aboveground roadway, but would

¹⁹ As measured between stations 7 and 27 (excluding off ramps and on-ramps).

be expected to contain relatively high concentrations of urban pollutants. The lesser volume of water allows greater flexibility and efficiency for potential treatment options, prior to discharge. It is anticipated that the tunnel sump would discharge in to the sanitary sewer system. However, consideration must be given to constraints related to the current capacity of the existing sanitary sewer system and its ability to handle additional flows. Temporary storage and incremental release to the sewer system may be required to meter flows to this system.

Flooding

The low-lying portions of the alignment, particularly in the area north of the Main Post and east of Halleck Street, may be subject to rare flooding events caused by tsunami wave run-up and/or extreme high tides. The elevation of the proposed roadways at the east Main Post tunnel portals are between 2.0 to 2.5 meters (6.6 to 8.2 feet). At the eastern end of the project area to Richardson Avenue the elevation would be 4.5 meters (14.7 feet). Expected inundation levels associated with these flooding events could be exacerbated over time with expected sea level rise because sea level rise incrementally increases the base level to which wave elevation would be added.

Any roadways or tunnels below 3.2 meters (10.5 feet) NAVD 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 3.35 meters (11 feet) NAVD. The elevations of all project components are shown on the profiles included in **Appendix B**. Based on review of available topographic data, the existing surface elevations in the vicinity of the Girard Road extension are near or below an elevation of 3.35 meters (11 feet) NAVD. Therefore, if the roadway were constructed at-grade without flood protection features, it is possible that the roadway could be inundated during one of these unusual and extreme events. Only the Presidio Parkway Alternative would place roadways at or near grade; the No-Build and Replace and Widen Alternatives have elevated roadways through this low-lying area.

Potential Alteration to Hydrogeology in the Vicinity of Bluffs

The PTMP includes measures designed to protect unique and fragile geologic and soil resources, including the Colma formation dunes, the Serpentine outcrops, the bluffs at Inspiration Point, and south of Crissy Field. This protection also extends to the subsurface hydrologic resources and functions, including the seeps and springs that occur along portions of the bluff. The construction of a tunnel upgradient of the bluffs (as proposed in the Presidio Parkway Alternative) would result in removal of a portion of the geologic materials that comprise a designated resource (these geologic resources are discussed in Section 3.3.2).

Surface and/or near surface water occurs at various locations on and at the base of the bluffs (north of the cemetery) year-round. Even though the bluffs are more than 90 meters (300 feet) from the proposed tunnel location, it is possible

that construction and operation of a tunnel upgradient of the bluffs could alter or disrupt groundwater, potentially impacting existing plants that rely on continuously emerging groundwater.

The groundwater upgradient of the bluffs is replenished by a combination of infiltration of rainfall during the rainy season, and year-round infiltration of irrigation water at the cemetery and other Presidio facilities. Water percolates through the sandy Colma Formation and into the underlying sheared and fractured Franciscan bedrock, primarily composed of sandstone, siltstone, and metamorphosed sedimentary rock. Groundwater dominantly flows in the Franciscan bedrock in fractures or cracks. The fracture patterns within the Franciscan unit have not been intensively studied, but are expected to be extremely complex. The fractures receive groundwater input in the area of the proposed tunnel and deliver it to the bluffs. Based on the proposed location and depth of the western Presidio Parkway tunnel, portions of the tunnel may be constructed at or near the contact between the Franciscan and the Colma formations. Groundwater conveyance to the fractures could be disrupted if the water table was substantially lowered and/or the fractures were somehow sealed.

In contrast, it is possible that construction of the tunnel may increase flow to the seeps on the bluffs by increasing deep infiltration in the location of the existing Doyle Drive roadway. Replacement of the existing surface segment of Doyle Drive with a tunnel would result in the removal of a substantial amount of impervious cover, thus increasing infiltration, and potentially raising the groundwater table locally. Raising the water table would steepen groundwater flow gradients and deliver more water to the bluffs. It is not known at this time whether an increase or decrease in flow within specific bedrock fractures would result in an impact to biotic resources on the entire bluff face.

Alteration of Surface and Near-Surface Hydrology at the Main Post Tunnel

The Main Post Tunnel (which consists of two adjacent tunnels at similar elevations, one for each direction of traffic) would approximately follow the alignment of the existing Doyle Drive. The elevation of the roadway in the tunnel (ranging from about 2 to 4 meters [6.6 to 13 feet] NAVD) would be substantially lower than the elevation of the existing Doyle Drive road surface (11 to 12 meters [36 to 39 feet]). The base of the tunnel box would be placed about one meter (three feet) below the existing ground surface, with the top of the tunnels ranging from about 10 to 12 meters (33 to 39 feet) NAVD. Fill would be placed between the existing bluff face and the south wall of the Main Post tunnel, essentially extending the plateau that supports Building 211 to the north. Up to two meters (six feet) of fill would be placed on the top of the tunnel. Fill would also be placed on the north side of the tunnel, creating a slope from the top of the box down to existing grade along Mason Street (in the approximate location of the Post Exchange building [Building 605]).

With the buried box tunnels surrounded by fill, there is a possibility that infiltrated rainwater may back up against the lower portion of the south tunnel wall, creating excessively moist conditions on the south side. If this were to occur, excessive moisture levels might reach the surface, potentially causing problems with drainage and vegetation management. In addition, it is possible that the fill on top of the tunnel box and on the downgradient (north) side of the tunnel box could become excessively dry due to lack of upgradient recharge and distance from a groundwater source. Studies of groundwater elevations do not suggest that under normal conditions groundwater levels in the fill upgradient of the tunnel would rise because damming effects of the tunnel would be minimal. It is possible, however, that during stormy wet periods that affect regional groundwater levels that the water table in the vicinity of the tunnel could rise and come into contact with the tunnel. The relationship of groundwater levels to the proposed tunnels is illustrated in **Exhibit 3-48**.

Preferred Alternative: Refined Presidio Parkway

The impacts of the Preferred Alternative are the same as those described above for Alternative 5. In addition, the impact discussion below applies to the Preferred Alternative.

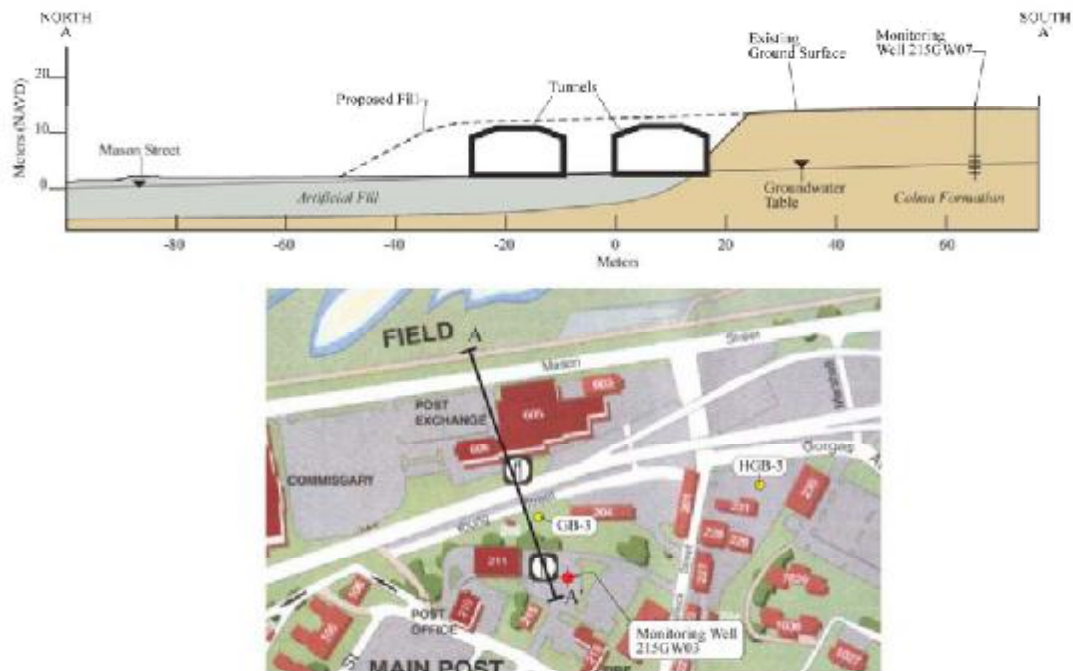
Alternative 2: Replace and Widen, Alternative 5: Presidio Parkway, and Preferred Alternative: Refined Presidio Parkway

A challenging issue for all of the build alternatives is the crossing of Tennessee Hollow and an expanded Crissy Marsh. The NPS and the Trust support substantial restoration of Tennessee Hollow from a largely culverted drainage to an open creek channel with an associated riparian corridor and saltwater marsh capable of supporting wildlife habitat and seasonal and tidal water movements. The NPS and the Trust are also pursuing expansion of Crissy Marsh to enhance hydrologic and ecologic function. The current alternatives all include an elevated structure in the vicinity of Tennessee Hollow. Therefore, the only remaining constraints to the hydrologic restoration of Tennessee Hollow and/or Crissy Marsh are associated with physical constraints of the elevated structures (i.e., the elevation of the bottom of the roadbed, the foundation abutments, and the eastern and western returns to grade).

The No-Build and Replace and Widen Alternatives include essentially no constraints associated with the bottom of the roadbed or return to grade structures to the east and west. The bottom of the causeway under with Presidio Parkway Alternative and Preferred Alternative is lower in the vicinity of Tennessee Hollow than the other alternatives. However, the proposed restored Tennessee Hollow creek bottom or Crissy Marsh is expected to be at lower elevations. From a hydraulic and hydrologic perspective, the flows of Tennessee Hollow could be adequately accommodated in a channel under the low causeway (although the width of the expansion area will be constrained to the east and west). Similarly, an expanded Crissy Marsh could be accommodated under a low causeway. The existing structure is supported by the existing foundation

abutments that are located approximately every ten meters (31 feet) along the alignment. The lateral spacing of abutments under the Replace and Widen, Presidio Parkway, and Preferred Alternatives would increase to about 32 meters (100 feet). Therefore, under the build alternatives, constraints, if any, associated with abutments will be reduced.

Exhibit 3-48
Main Post Tunnel



Avoidance, Minimization and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. Groundwater and stormwater treatment measures as described below will minimize or eliminate impacts on hydrology, water quality, and stormwater run-off resulting from the Preferred Alternative.

Management of Groundwater During Construction

Excavation for the tunnel through the east bluff area north of the cemetery will be 2 to 3 meters (6 to 9 feet) below the existing water table. This potential condition warrants the use of a shoring system that will minimize groundwater intrusion into the below-ground work area. With an appropriate temporary

shoring system in place, strip drains will be installed during excavation to permanently convey groundwater around the tunnel, as described below.

Flood Protection from Extreme Tidal Events

Although there are no designated 100-year floodplains in the project study area, highway designs will need to include flood protection for the low portions of the Preferred Alternative roadways at:

- the eastern portal of the Main Post tunnel; and
- the depressed segment of Girard Road.

The flood protection features will consist of either landscaped berms or barrier structures with crests greater than 3.35 meters (11 feet) NAVD. The berms and barriers with crests greater than 3.35 meters (11 feet) will be used for flood protection unless other designs are developed with the Presidio Trust and NPS which achieve the necessary flood protection, while improving opportunities for achieving a viable corridor between Tennessee Hollow and Crissy Marsh. Properly designed and constructed flood protection structures will reduce tidal flooding impacts.

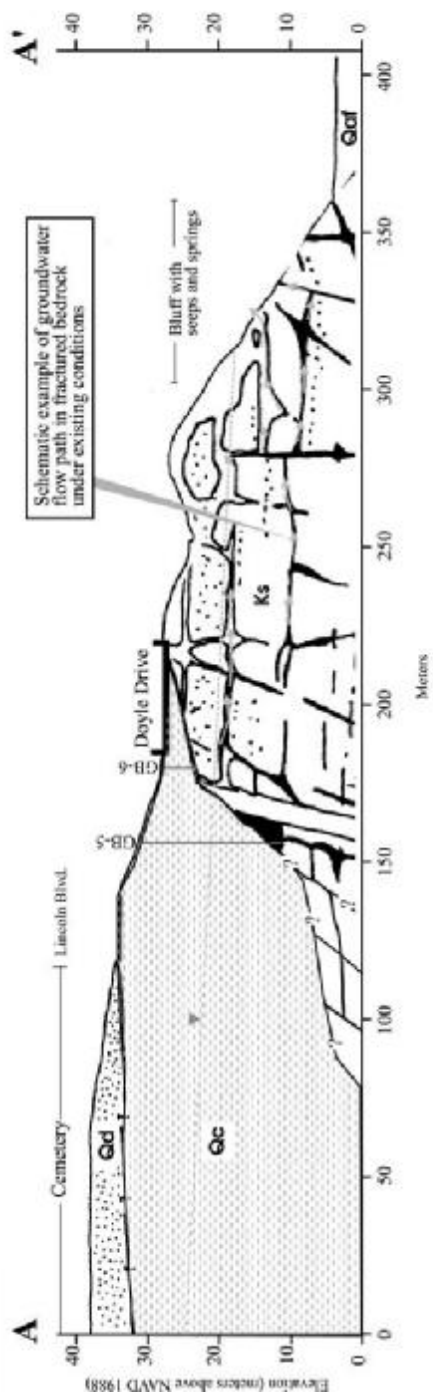
Minimize Disruption of Hydrogeology in the Vicinity of the Bluffs

In order to maintain hydrologic conductivity (groundwater movement, pathways) within the proposed tunnel area, tunnel construction will include placement of discrete high-permeability strip drains consisting of a fabricated geocomposite core within a filter fabric around the tunnel box (See **Exhibit 3-49** on the following page).

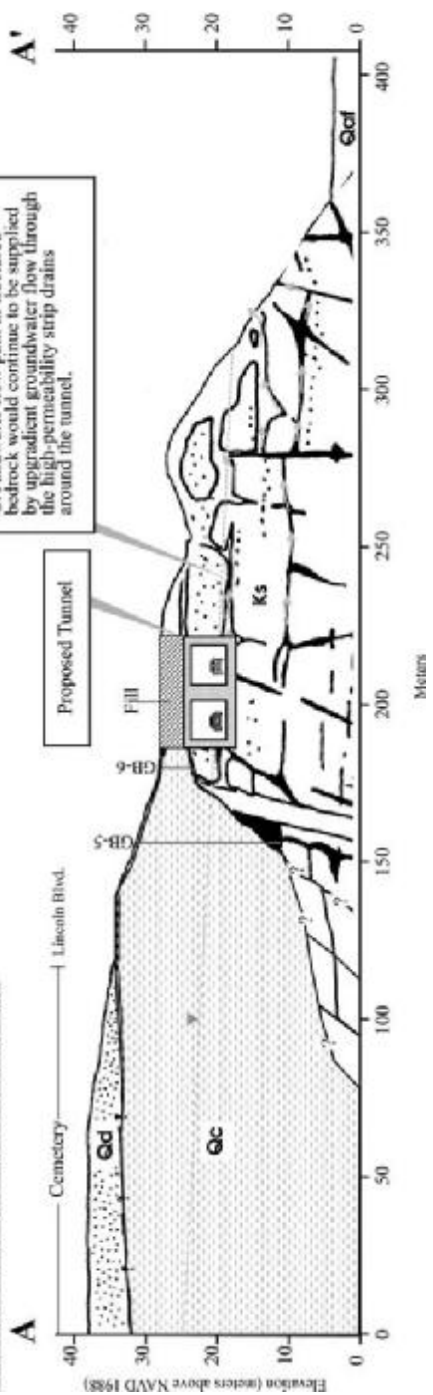
Groundwater will be intercepted on the upstream (south) side of the tunnel and flow through the strip drains to discharge at locations outside the northern sidewall of the tunnel. The strip drains will be placed against the exposed rock at water-bearing fractures and fissures before the concrete box is poured; the tunnel box will be reconnected to the geologic formation with concrete and/or low permeability backfill. Any fractures that are receiving groundwater under existing conditions and delivering the water to the bluffs will be expected to continue to receive groundwater flow from the strip drains around the tunnel and/or the undisturbed formation below the tunnel. The strip drains will be expected to convey a similar quantity of groundwater to the bluff that the existing fractured bedrock formation delivers. However, the flow and volume in specific fractures may be altered.

Exhibit 3-49
 Geologic Cross-Section Showing Groundwater Flow Conditions in the Vicinity of the Bluffs

EXISTING:



FUTURE: (Preferred Alternative)



Maintenance of Hydrologic Conditions at the Main Post Tunnel

The tunnel box will be constructed with a permeable gravel envelope and/or strip drains around the box and water will be easily transmitted to the downgradient side under the tunnel.²⁰ The passage of groundwater under the tunnel through permanent drainage features will minimize the potential for rising groundwater on the south side of the tunnel. Fill soils on top of the tunnel box will not be directly underlain by a groundwater table, and therefore will be seasonally dry. Due to the anticipated moisture conditions, the revegetation of this area will require special plant selection or irrigation. The fill prism north of the tunnel will likely develop a similar soil moisture profile as has developed in the existing Colma formation bluff materials (composed of weakly consolidated fine- to medium-grained sands with intermittent clay layers). The maximum depth to groundwater in the new sloping fill prism on the north side of the tunnel will be about the same or less than the existing conditions on the top of the bluff (because the fill prism toward the north will decrease in thickness, reducing the depth to the water table from south to north). Therefore, no new adverse soil moisture conditions, relative to existing conditions in the vicinity, are likely to occur on the north side of the tunnel.

Managing Construction Stormwater Run-Off

Under the requirements of the NPDES *Caltrans Statewide Stormwater Permit* and the *Construction General Permit*, the project proponent will develop a SWPPP prior to construction to reduce pollutants in stormwater discharges and the potential for erosion and sedimentation. Since the project is located in an area managed by the Trust and the NPS, the project proponent will consult these agencies when preparing the SWPPP. The SWPPP will identify potential pollutant sources that could affect the quality of runoff and identify, construct, and implement the mutually acceptable stormwater pollution prevention measures, referred to as *Best Management Practices* (BMPs). BMPs are designed to reduce pollutants in stormwater discharges from the construction site. Control measures could include construction of detention structures, installation of siltation fencing, appropriate grading practices, dust control, soil stabilization, temporary seeding, and equipment wash-down facilities. The SWPPP will specify a monitoring program, and will require that the supervisors and workers be knowledgeable about each portion of the sites, and maintain awareness of the importance of stormwater quality protection and pollution prevention. Compliance with existing regulations, programs, and the SWPPP will adequately address potential construction stormwater runoff impacts.

²⁰ The gravel envelope and/or strip drains would require that groundwater flow under the tunnel box is not impeded. Groundwater would be expected to flow easily from the northern upgradient areas, under the tunnel, toward the Bay.

Managing Water Quality from Construction Dewatering

The project proponent will characterize the quality of groundwater in the vicinity of the dewatering operations (prior to initiation of dewatering). Contaminated sites that could affect dewatering associated with the project are shown on **Exhibit 3-54** in the Hazardous Waste/Materials section. The dewatering will take place in conformance with the Caltrans permit and SWMP or any separate dewatering permit issued by the San Francisco Regional Board.

Any discharge of groundwater to the sanitary sewer system will be required to comply with the San Francisco Public Utilities Commission (SFPUC) pretreatment standards and other requirements for discharge to the City's sewer system. Any such discharge will require the Southeast Water Pollution Control Plant to accommodate a temporary and very minor additional pollutant load. Prior to discharge of the dewatering effluent to the Presidio sanitary sewer system, an approval for discharge will be required from the Presidio Trust Utilities Department. As noted earlier, the ability of an existing sanitary sewer system to accept additional flow may require temporary storage in order to meter out flows to keep from overwhelming the system during peak events. Where feasible, discharges should be made directly to the SFPUC system because the Presidio system was not designed to handle storm flows and capacity could be a problem. Discharge to the storm sewer system (and eventually to the Bay) or directly to the Bay will be addressed by the *Caltrans Statewide Permit*, which incorporates the performance requirements and other technical provisions of the *Construction General Permit* and will be subject to the quantitative water quality objectives included in the SFRWQCB Basin Plan. The NPS and Trust will be included in the process of determining acceptable water quality thresholds for discharge. In exceptional cases, the SFRWQCB may require a separate NPDES permit for the dewatering discharge.

Representatives from the Trust, SFPUC and the SFRWQCB will coordinate with the project proponent and Caltrans to determine acceptable thresholds for discharge to the sanitary sewer system. 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 will be made. Implementation of the Caltrans permit and SWMP will minimize the potential impact of disposal of contaminated groundwater into the combined sewer system and the local storm drain system.

In addition, the project proponent will either: 1) demonstrate through detailed hydraulic calculation that project-related effects of dewatering on the Palace of Fine Arts Lagoon levels will not be substantial, or 2) enter into an agreement with the SFPUC to contribute to cost of monitoring and replenishment of lagoon levels during the dewatering operation period.

Long-Term Stormwater Treatment Options

Doyle Drive is located within a national park. As such, special consideration must be given to the treatment of stormwater runoff. The following treatment options are favored for implementation to eliminate or reduce pollutants in runoff from the proposed project. Stormwater Treatment Option 1 provides maximum protection to resources within the National Park setting.

Doyle Drive stormwater runoff is currently discharged to existing drainage facilities without treatment. The Preferred Alternative will include some form of treatment controls, and therefore will provide a net benefit to stormwater runoff quality and the quality of receiving waters.

Stormwater Treatment Option 1

Stormwater runoff from the Doyle Drive Project, including washdown water (water from cleaning the tunnel) and incidental runoff from within the tunnels will be collected and ultimately discharged to the existing SFPUC combined sewer system. This runoff will then be treated at the city and county of San Francisco wastewater treatment facility. This option is subject to approval from the SFPUC and as noted earlier, will require studies to ensure that runoff volumes that are discharged are compatible with the ability of the combined sewer system to accept flows.

Stormwater Treatment Option 2

Runoff from the new roadway will be treated prior to discharge to surface waters, to the extent feasible, at or near the new structure. Caltrans will coordinate with the Trust and NPS during the permanent treatment control selection process. The Preferred Alternative will incorporate, to the maximum extent practicable (MEP), the treatment of roadway pollutants in runoff prior to discharge to any surface water systems. In accordance with the SWMP, BMPs will be designed, constructed, and maintained to treat stormwater runoff from the new roadway associated with this project within the roadway right of way. Frequent small storms, which over the long-term carry the substantial quantity of total pollutant load, will be the focus of the treatment BMPs. Most modern, well-designed runoff treatment systems include bypass features that allow the safe passage of larger untreated storm flows.

Based on the physical constraints along the alignment, it will be challenging to identify feasible treatment controls that are effective in the removal of specific pollutants. However, preliminary hydraulic analysis indicates that there is adequate space adjacent to the proposed structure to treat stormwater runoff to the MEP level. Caltrans will conform to the requirements of its SWMP to incorporate treatment controls and, during the design phase, will use Caltrans-approved BMPs to treat roadway runoff to the MEP. Caltrans-approved BMPs include:

- land-based biofiltration, detention and infiltration treatments that employ filtering medium in combination with vegetation to filter and treat stormwater; and

- “in-line” structural BMPs such as media filters and multi-chamber treatment trains that treat concentrated runoff. The structural BMPs typically require less area for installation and are more maintenance intensive.

During detailed design the selection of treatment measures will follow sustainable design practices as described in Section 2.2.3 with consideration of the project setting. Sustainable design favors the use of passive, low impact treatments over more energy consuming in-line or remote treatment options.

If none of the approved BMPs appear feasible, Caltrans, the NPS and the Trust will work cooperatively to develop other mitigation measures for stormwater treatment.

Washdown water (from cleaning the tunnel), any incidental stormwater runoff collected from within the tunnels, and any water which may seep into the tunnels will be disposed of in one of the following ways:

- 1) discharged to the sanitary sewer system;
- 2) collected and hauled off-site for treatment and disposal; or
- 3) treated on-site in a specially designed separate treatment system.

Any treated water that is discharged to Crissy Marsh or tributaries to Crissy Marsh must meet approved water quality criteria. The NPS and the Trust will be consulted when establishing the criteria.

Caltrans will collaborate with the NPS and the Trust to develop feasible stormwater treatment measures for implementation. If more than one type of Caltrans-approved BMP is determined to meet the MEP requirement, Caltrans will select the preferred BMP in consultation with the NPS and the Trust.

3.3.2 Geology /Soils /Seismic /Topography

This section presents a general overview of soils and geologic resources in the study area. A more comprehensive analysis can be found in the *South Access to the Golden Gate Bridge: Doyle Drive Revised Preliminary Geotechnical Report*, September 2004.

Regulatory Setting

The California Department of Transportation (Caltrans) has developed guidelines for investigating soils and geologic conditions, and designing transportation facilities accordingly. Examples include: *Guidelines for Structures Foundation Reports, Version 2.0* (Caltrans, 2006); *Corrosion Guidelines, Version 1.0* (Caltrans, 2003); and *Seismic Design Criteria* (Caltrans, 2004).

The *Presidio Trust Management Plan* (PTMP) indicates that the Presidio Trust would protect and monitor geologic resources and functions. Natural soils and soil processes would be managed to minimize loss and disturbance. Wherever feasible, soils affected by construction would be salvaged for reuse in other Presidio site restoration activities.

The National Park Service's (NPS) *Management Policies*, 2001 provide information regarding geologic resources. In addition, NPS provides additional guidance for management of geologic materials in national parks through NPS policies set forth in the following Director's Orders:

- *Director's Order 13A – Environmental Management Systems; and*
- *Director's Order 77-9 In-park Borrow Material (under development).*

Affected Environment

The San Francisco Bay Area, as it is known today, was formed in the mid- to late-Pleistocene period (approximately 1,000,000 to 10,000 years ago). Like all other areas of California, a long record of seismic activity characterizes the geologic history of the San Francisco area. In addition, the area has been strongly influenced by the melting of Pleistocene glaciers in the Sierra Nevada Mountains and the San Francisco Bay trough. The resulting topography is characterized by variable thicknesses of recent deposits of soft to medium stiff clays (Bay Mud), older stiffer Pleistocene clay (Old Bay Clay), and sand deposits.

Topography and Natural Features

Generally, the topography of the Presidio in the project study area is divided by the various bluffs into the upper hilly inland portion and the lower flat coastal area. Areas of natural topography were identified by comparing the earliest available survey date from 1871 with the current topography. The comparison indicates that the portion of the Western Bluff that is within the project study limits has been extensively graded to accommodate the existing Park Presidio Interchange.

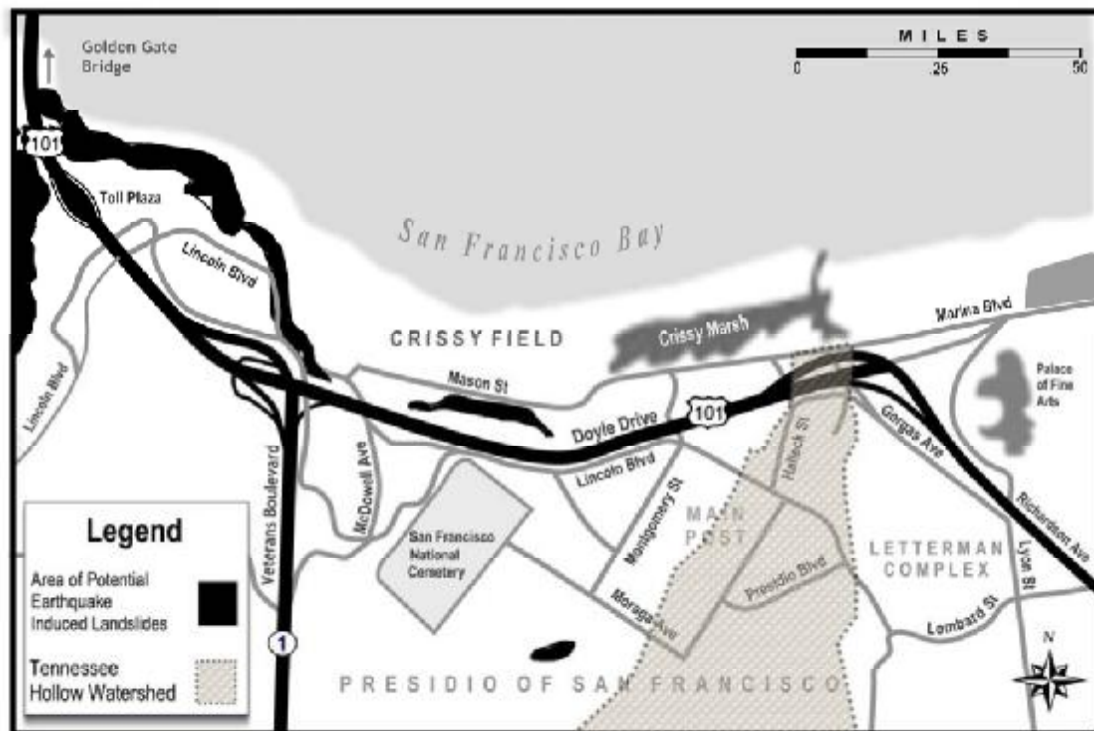
The existing Doyle Drive high-viaduct spans between the Western and Eastern Bluffs that rise steeply to about 25 meters (80 feet) above Crissy Field to the northeast. The area of Cavalry Hollow between the two bluffs is approximately 18 meters (60 feet) deep and 460-meters (1,500 feet) wide. This valley appears relatively unchanged from its natural state but the area has been graded to accommodate the stable buildings and access roads. The face of the Eastern Bluff appears relatively undisturbed and features natural exposed outcrops of fractured bedrock down slope from the National Cemetery. However, the top of the bluff was re-graded during the construction of the historic batteries and further modified when the existing facility was built. Also evident in the same general area is a slide repair, immediately north of the west abutment of the low-viaduct.

To the east of the Eastern Bluff, the slope under the existing facility is similar to the natural landform but was excavated and backfilled during the construction of the existing low-viaduct. The lower bluff north of the Main Post still creates a vertical separation at the east end of the project but the bluff face itself is not the natural bluff depicted on the 1871 survey. East of Halleck Street, the original bluff has been obscured due to the construction of a large number of military buildings and the placement of artificial fill, and the route is relatively flat. It

follows the southern boundary of the Crissy Field area, with elevations ranging from 2.7 to 3.7 meters (9 to 12 feet), and ends near the Exploratorium which is generally flat, and located on fill. Extensive fill material was placed along the shoreline prior to the 1915 Pan Pacific Exposition and, additional minor amount was placed in the 1960s.

The Eastern Bluff is an important feature. The PTMP states, “The Presidio contains some fragile geologic resources, including the Colma Formation dunes, and the serpentine outcrops and bluffs at Inspiration Point and south of Crissy Field.” The general location of the Eastern Bluff, and other key topographic features, are illustrated in **Exhibit 3-50**.

Exhibit 3-50
General Location of Topographic Features



Regional Seismic Setting

The major faults mapped in the Bay Area are all part of the northwest-trending San Andreas Fault system. Although no known fault specifically crosses the project study area, three major faults are located within 25 kilometers (15.5 miles) of the project site. These faults are the San Andreas Fault located 9 to 10.5 kilometers (5.5 to 6.5 miles) west of the project area; the San Gregorio Fault located 13 to 14.5 kilometers (8 to 9 miles) west of the project area; and the Hayward Fault located 19.5 to 21 kilometers (12 to 13 miles) to the east of the

project area. Historically, both the San Andreas and Hayward Faults have generated large earthquakes.

A map of *Seismic Hazard Zones for the City and County of San Francisco* (CDMG, 2000) indicates landslide potential at the following two locations:

- on the Western Bluff, starting from near the western end of the high-viaduct, going westward; and
- in a narrow zone along the northern edge of the Eastern Bluff, about 61 meters (200 feet) from the present Doyle Drive alignment.

There is also a slide repair on the Eastern Bluff slope face immediately north of the west abutment of the low-viaduct. Based on communication with the Presidio Trust and Caltrans, the slide of this manmade slope was caused by failure of a storm drain.

Site Specific Geologic and Soils Conditions

Within the Doyle Drive corridor, the topography is the result of various geologic conditions. Shallow bedrock of the Franciscan Formation, a heavily folded and sheared assemblage of greywacke, shale, sandstone, chert, and serpentine, generally dominate the higher elevations at the western end and to the south of the project corridor. Overburden soils in these regions consist of artificial fill, slope debris, ravine fill, and/or Colma Formation. The Colma Formation consists of clay layers intermixed with unconsolidated to weakly consolidated, fine- to medium-grained sand. Lower elevations on the eastern portion of the Doyle Drive corridor, such as south of the Crissy Marsh, reflect an estuarine deposition environment, where the bedrock is considerably deeper. Surface soils in this area are dune and beach sands, and soft clayey silt layers. These soils are generally underlain by the Colma Formation, which rests on bedrock.

Bedrock consists of greywacke, which has been intruded by igneous rocks like serpentine and belong to the Franciscan Formation. West of Station 10+84 (west of McDowell Avenue), the bedrock is exclusively serpentine and is exposed along the Western Bluff slopes.

Another defining feature within the project area is the presence of an extensive historic tidal marsh separated from San Francisco Bay by a beach and dunes. The area, which extends from Crissy Field in a southeasterly direction towards Lombard Street and underlies Doyle Drive east of the Post Commissary Building, was filled in 1912. Soil borings within the area show very soft clay-rich silt deposits interlayered with thicker beach/dune sand layers. The overlying fill material consists of loose sands with variable amounts of silt and clay.

Soil Liquefaction²¹

In the Doyle Drive Project study area, the soils most susceptible to liquefaction are the soft deposits from the historic tidal marsh. Soft soils are present throughout the travel corridor, particularly east of Station 20+00. Soil borings confirm the presence of relatively thin layers of soft clayey silts and loose sands from around Station 17+00 to Station 28+00. **Exhibit 3-51** presents the general location of these stations, which are linear reference points along a proposed alignment. Each station number indicates a specific location on the alignment.

The deposits are interbedded layers of silty sands, sandy silts, and clayey silts. The maximum depth of these soft materials was found to be about six meters (20 feet), except for a well boring beyond Station 23+50 towards Marina Boulevard, where soft clayey silt was encountered to ten meters (35 feet) in depth. This layer appears to extend deeper going north towards San Francisco Bay. **Exhibit 3-52** shows potential areas of soil liquefaction. Another portion of the project study area that has potential for liquefaction is between Stations 9+50 and 11+30 in the vicinity of the high-viaduct.

Excessive Settlements and Land Movements

Landslides have been a problem on the Eastern Bluff slopes immediately north of the west abutment of the low-viaduct. There were two failures in 1998. One was due to a culvert failure, which caused extensive erosion in the bluff directly under the eastbound structure. The second failure occurred on the north side of the west abutment of the low-viaduct. It was caused by water infiltrating a poorly compacted slide mass. Uncontrolled dumping at this site in the past was a contributing factor. The slope was rebuilt with underdrains and recompacted.

Borings drilled to investigate the depth and quality of the rock in the Eastern Bluff area indicate that intensely weathered and intensely fractured sandstone with siltstone is present 3.5 meters (11.5 feet) below ground surface. Another boring further east indicates intensely weathered and intensely fractured metasedimentary rock at around 18 meters (95 feet) below ground surface.

Temporary Impacts

The following section presents potential temporary impacts to soils and geology due to construction activities in the project study area.

Alternative 1: No-Build

Based on the *Final Preliminary Geotechnical Report*, October 2004, the existing structure would remain unchanged. Hence, under the No-Build Alternative, there would be no temporary impacts to geological/earth resources.

²¹ Soil liquefaction is the loss of strength that can occur in loose, saturated soil during or following an earthquake or other rapid loading. Liquefaction occurs most readily in sand deposits. In the liquefied zones, the strength of the soil decreases and the ability of the soil to support foundations for buildings and bridges is reduced.

Exhibit 3-51
General Location of Project Stations

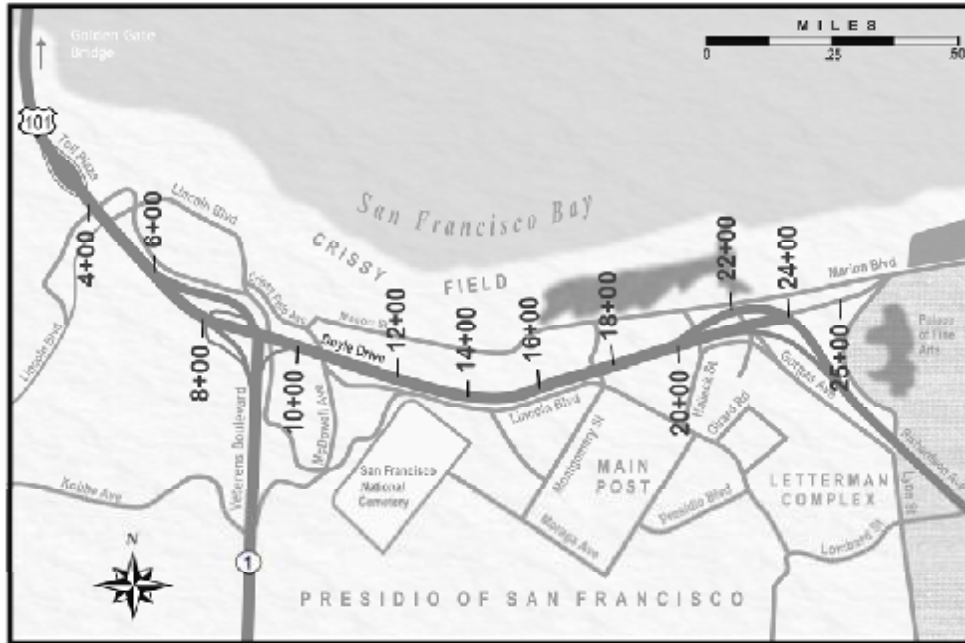


Exhibit 3-52
Potential Areas of Soil Liquefaction



Alternative 2: Replace and Widen

Temporary impacts resulting from Alternative 2 are the same for all build alternatives. Impacts are discussed below.

Alternative 5: Presidio Parkway

Temporary impacts resulting from Alternative 5 are the same for all build alternatives. Impacts are discussed below.

Preferred Alternative: Refined Presidio Parkway

Temporary impacts resulting from the Preferred Alternative are the same for all build alternatives. Impacts are discussed below.

Alternative 2: Replace and Widen, Alternative 5: Presidio Parkway, Preferred Alternative: Refined Presidio Parkway

During construction of any of the Doyle Drive build alternatives, topographic grades and non-vegetated, exposed ground will be created that will be susceptible to wind and water erosion.

In addition, development of the Doyle Drive Project may expose construction workers to hazardous concentrations of naturally-occurring asbestos present in serpentinite bedrock. Serpentinite was encountered west of Station 9+26 in soil borings at depths ranging from 0.3 to 7 meters (1 to 23 feet). The rock will therefore be encountered during the pile cap excavations and during cast-in-drilled-holes (CIDH)²² pile drilling for the high-viaduct and the viaducts for the Park Presidio Interchange. Serpentinite is a source of fibrous asbestos (chrysotile), which is a known carcinogen and may cause scarring of the lungs. Although intact bedrock itself poses no risk, drilling, blasting, and removal of serpentinite may expose workers to airborne asbestos.

Permanent Impacts

Long-term impacts to soil and geologic resources are expected. The proposed Doyle Drive facility has been designed to avoid disruption of slopes, liquefaction, and other geologic/soils conditions. In addition, standard construction procedures include measures to avoid and/or minimize potential impacts. Controls may be implemented to prevent erosion, including temporary slope protection to stabilize cut slopes, and temporary shoring structures during the excavation of tunnels under Alternative 5 and the Preferred Alternative. A *Stormwater Pollution Prevention Program* (SWPPP) would be implemented and *Best Management Practices* (BMPs) followed to minimize erosion during construction.

Exhibit 3-53 compares the estimated volume of different material type excavated for each proposed alternative. In general, native material is removed only in the western portion of the project site. Excavation of the Main Post tunnels and the low-viaduct is generally limited to within the artificial fill.

²² CIDH piles are reinforced concrete piles cast in holes drilled to predetermined elevations.

Therefore, only the volume of native material excavated for the high-viaduct and the Battery Tunnel are listed in **Exhibit 3-53**.

Exhibit 3-53
Summary of Disturbance of Native Soil and Rock

Alternative	Material Type	High-Viaduct Excavation m ³ (yard ³)	Battery Tunnel Excavation m ³ (yard ³)	Subtotal Excavation m ³ (yard ³)	Total Excavation m ³ (yard ³)
Alternative 2 - Replace & Widen	Soil ¹	26,300 (34,400)	n/a	26,300 (34,400)	30,100 (39,300)
	Bedrock ²	3,800 (4,900)	n/a	3,800 (4,900)	
Alternative 5 - Parkway - Loop Option	Soil	23,300 (30,500)	97,200 (127,100)	120,500 (157,600)	153,200 (200,300)
	Bedrock	1,700 (2,200)	31,000 (40,500)	32,700 (42,700)	
Alternative 5 - Parkway - Hook Option	Soil	23,300 (30,500)	97,200 (127,100)	120,500 (157,600)	153,200 (200,300)
	Bedrock	1,700 (2,200)	31,000 (40,500)	32,700 (42,700)	
Preferred Alternative	Soil	23,300 (30,500)	59,200 (77,400)	82,500 (107,900)	109,600 (143,300)
	Bedrock	1,700 (2,200)	25,400 (33,200)	27,100 (35,400)	

¹ Much of the soil appears to be Colma Formation and includes dune and beach sands and soft clayey silt layers.

² Bedrock includes Franciscan Formation which is dominated by greywackes. The greywackes are interbedded with dark shale and occasional limestone. Bedrock also includes sandstones, shale and serpentine.

The following is a discussion of potential permanent impacts which could occur for each project alternative.

Alternative 1: No-Build

The existing roadway was constructed using the best available engineering technology at that time. However, portions of the alignment do not meet current earthquake standards. Due to its general conditions, it was not considered feasible to retrofit the low-viaduct structure for “No-Collapse” after the Maximum Credible Earthquake (MCE)²³. Based on the Working Group on California Earthquake Probabilities (USGS, 1999), the estimated probability of a major earthquake occurring in the San Francisco Bay Area before 2030 is 70 percent. Earthquakes are an unavoidable geologic hazard at the Presidio and it could lead to the failure of the low-viaduct.

²³ The Maximum Credible Earthquake (MCE) is the largest ground motion expected to occur at the project site once every 1,500 years.

Alternative 2: Replace and Widen

The alignment of Alternative 2 follows that of the existing facility and does not further modify the remaining area of natural topography along the face of the Eastern Bluff. In areas where the natural topography has already been modified, the project would generally restore the existing grades. The Park Presidio Interchange would remain in the existing location and the topography of Cavalry Hollow would be restored to its existing state. The slope to the east of the Eastern Bluff would be excavated and restored as it was during the construction of the existing facility. The eastern portion of Alternative 2 aligns over the artificial fill areas and would not further disturb the natural topography.

The loss of native geologic material associated with construction in this alternative is summarized in **Exhibit 3-53**. Since serpentine only occurs on the Western Bluff, the estimated volume of excavated serpentine in Alternative 2 is only the amount listed under High-Viaduct Excavation in **Exhibit 3-53**.

Alternative 5: Presidio Parkway

Alternative 5 does not further modify the remaining area of natural topography along the face of the Eastern Bluff. Generally, only areas that have already been modified from their natural state would be affected. The replacement of the Park Presidio Interchange would cause additional disturbance to the already heavily modified topography of the Western Bluff. The existing topography of Cavalry Hollow would be modified to accommodate the realignment of Lincoln Boulevard and Crissy Field Avenue. The slope to the east of the Eastern Bluff would be replaced with a retaining wall to accommodate the new facility. The low bluff north of the Main Post would be covered by the fill placed over the Main Post tunnel and a new bluff north of the new facility would be created.

The loss of native geologic material associated with construction in this alternative is summarized in **Exhibit 3-53**. Since serpentine only occurs on the Western Bluff, the estimated volume of excavated serpentine in Alternative 5 is only the amount listed under High-Viaduct Excavation in **Exhibit 3-53**.

Preferred Alternative: Refined Presidio Parkway

The impacts of the Preferred Alternative are the same as those described above for Alternative 5.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. The disturbance and removal of geologic resources to permit the construction of the Preferred Alternative is unavoidable. Other geologic concerns will be addressed, as described below, through appropriate subsurface investigation and design considerations.

Design and Engineer for Earthquake Activity

Seismic design for the structures will be based on the *Caltrans Seismic Design Criteria* (Caltrans, 2001). Recommendations are provided in the criteria to modify designs to incorporate the effects of the fault type, fault proximity, and structures on deep (greater than 76 meters [250 feet]) soil sites. Road structure designs will be based on a Magnitude 8 earthquake on the San Andreas Fault. The San Andreas Fault segment is the governing fault for this project.

Design and Install Foundations Resistant to Soil Liquefaction and Settlement

Special design features will be incorporated into structures that will be placed in soils vulnerable to liquefaction. The high-viaduct and low-viaduct tunnels, and the causeway foundations will be required to resist complex loads and seismic activity, particularly large earthquakes. To mitigate for complex loading, seismic activity, and potential soil liquefaction and settlement, deep foundations will be required for the viaducts. The most common forms of deep foundations are piles. Different types of piles offer different advantages and are better suited for different geologic settings. CIDH piles are recommended for the high-viaduct foundations where the bedrock is shallow, as is expected for the western half of the high-viaduct. Driven piles are recommended for the rest of the viaduct foundations. Piles will be placed to a level below the liquefaction zone to provide proper foundation support. In addition, stronger sections will be used for the upper portions of the piles in order to resist the lateral loads which will occur during a seismic event.

Additional subsurface investigations (via borings or cone penetrometer testing [CPT]) for each structural component will be necessary to obtain site-specific information to adjust piling and foundation design along the entire alignment. Borings or CPTs will also be required on surface roads to aid proper design of the pavements. Recommended scope and type of additional subsurface investigations are presented in the *South Access to the Golden Gate Bridge: Doyle Drive Project Final Preliminary Geotechnical Report*, September 2004.

Large soil settlements are likely in the event of liquefaction in former areas covered by the historic tidal marsh, such as in the area of the Main Post Tunnels and the causeways. Such settlements will be of minor consequence to the causeways and tunnels if measures are taken in the design of the pile foundations to appropriately incorporate the effects of the liquefied layers.

In 'soft soil' areas, such as the Main Post Tunnels, the soils are inadequate for supporting the tunnels and backfilled soil cover. While it is proposed that the tunnels be supported on piles penetrating into the dense sandy substrate underlying the soft upper soils, alternative measures to improve the 'soft soils' could be investigated, whereby the need for pilings may be eliminated. Soil improvement technique could be incorporated if it does not have impact on the hydrogeologic regime.

Identify Potential Serpentinite Bedrock Disturbance Areas and Implement Safety Plan

Prior to project construction, geotechnical borings from the site will be reviewed to identify areas of serpentinite bedrock that will be disturbed during project construction. An *Asbestos Dust Mitigation Plan* will be prepared and submitted to the Bay Area Air Quality Management District (BAAQMD), in accordance with the Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations. The *Asbestos Dust Mitigation Plan* will include *Best Management Practices* (BMPs) to minimize dust during grading and other earthmoving operations. BAAQMD will also be notified at least 14 days prior to construction activities at the site. Workers will have appropriate training and equipment to detect and handle the material when encountered. All work involving handling and disposal of asbestos, as well as worker health and safety arising out of the serpentine should be performed with strict adherence to all applicable Caltrans, federal, state and local laws and regulations.

Use/Manage Excavation Materials and Implement Geotechnically-Stable Grades

All earthwork for the project will conform to the requirements of *Section 19* (Earthwork) of the most current *Caltrans Standard Specifications*. Soils excavated in one location will be reused as fill or backfill in another location to the extent possible, provided it meets the appropriate requirements. Unsuitable materials such as contaminated soils or soils with high plasticity or excessive organic content will be appropriately disposed of offsite. Soils identified with serpentine will have to be tested to determine suitability for on-site use as fill materials. An earthwork management plan will be developed in coordination with Trust and the NPS.

If archaeological materials not subject to scientific study are redeposited elsewhere on the Presidio, the project proponent will consult with the land manager to ensure that the secondary nature of the materials is documented appropriately and that the primary and secondary locations of such materials are plotted on appropriate maps and documented in such a way to inform future researchers.

3.3.3 Hazardous Waste/Materials

Hazardous materials and wastes can be encountered unexpectedly during the construction and operation of public projects. Examples of common hazardous materials include asbestos, lead-based paint, and volatile organic compounds²⁴ and, without proper handling, removal, and containment, can pose dangers to the public. Identifying potential waste sites prior to construction is important because it can substantially reduce the possibility of exposure to people and the environment. In the event unexpected encounters do occur, having proper plans and procedures in place further reduces that risk.

²⁴ This term is generally applied to organic solvents, certain paint additives, aerosol spray-can propellants, fuels (such as gasoline and kerosene), petroleum distillates, dry cleaning products, and many other industrial and consumer products ranging from office supplies to building materials.

This section presents a summary of the hazardous materials and wastes which are located in the Doyle Drive Project study area. More information can be found in the *South Access to the Golden Gate Bridge: Doyle Drive Project Revised Preliminary Site Investigation*, October 2004.

Regulatory Setting

Federal, state, and local laws and regulations govern the use, storage, transportation, and disposal of hazardous materials, as well as management of contaminated soils and groundwater. The U.S. Environmental Protection Agency (EPA) oversees hazardous waste regulations. State and regional agencies are responsible for administering and enforcing California laws and regulations. These include the California Environmental Protection Agency (Cal EPA) Department of Toxic Substances Control (DTSC), the San Francisco Bay Regional Water Quality Control Board (SFRWQCB), the California Air Resources Board (CARB), and the Bay Area Air Quality Management District (BAAQMD). Locally, the San Francisco Department of Public Health (SFDPH) is responsible for certain hazardous material regulation enforcement within the city and county of San Francisco. The San Francisco Fire Department (SFFD) acts as first responder for hazardous material incidents within the study area. The U.S. Department of Transportation (USDOT) is the Federal-administering agency for the safe transport of hazardous materials.

Additional laws, regulations, policies, and programs regulate the investigation of Federal properties, such as the Presidio, which are affected by hazardous materials. One of the primary laws affecting Federal properties is the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA). Passed in 1980, CERCLA created national policies and procedures to identify and remediate sites affected by hazardous substance releases.

The National Park Service (NPS) provides additional guidance for management of hazardous materials and wastes in national parks through NPS policies set forth in the following Director's Orders, Executive Order, and Staff Directive:

- *Director's Order 13A – Environmental Management Systems;*
- *Director's Order 30A – Solid and Hazardous Waste Management (under development);*
- *Director's Order 30B – Hazardous Spill Response (under development);*
- *Executive Order No 13148 – Greening the Government through Leadership in Environmental Management; and*
- *Staff Directive 76-20 – Disposal of Hazardous and or Solid Waste (Resource Conservation and Recovery Act).*

Affected Environment

The project is located within the Presidio, which was a military installation until 1994. Due to its military past and the age of the facilities, a number of hazardous materials sites are located within the project area.

In December 1988, the Presidio Army Base was proposed for closure. From 1988 to 1999, the U.S. Army was responsible for investigation and remediation of environmental issues at the Presidio. Several environmental investigations of the Presidio were conducted during the base closure process in accordance with CERCLA.

In 1999, an agreement was reached between the Army and the Presidio Trust to transfer responsibility for the remaining environmental cleanup to the Trust. Although the portion of the Presidio north of Doyle Drive is administered by the NPS, and the NPS is a participating agency for remediation in those areas, the Trust remains the lead agency for all remediation activities at the Presidio.

Methodology

Information from the above activities provided a foundation for identifying existing hazardous materials sites in the study area. Data collection tasks included:

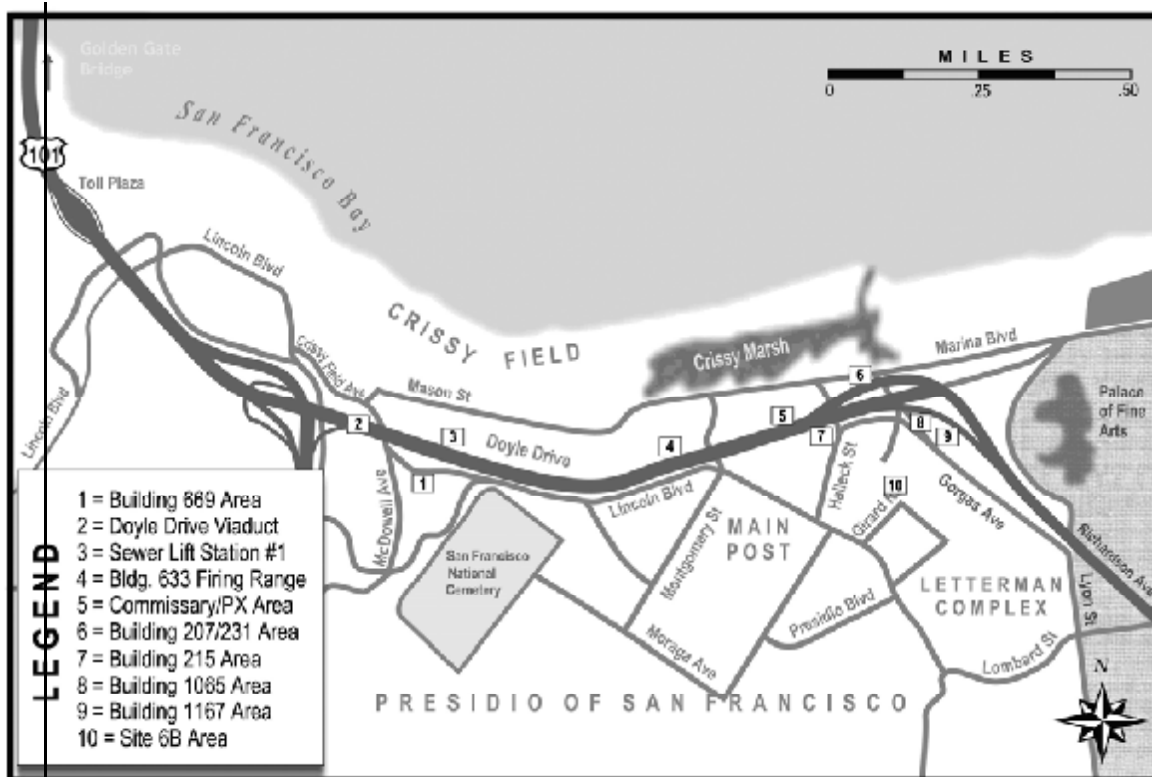
- **Data Survey:** A *Preliminary Site Investigation* (PSI) was conducted to identify hazardous waste/materials within the potential Doyle Drive Project study area. Information for this investigation was obtained by a review of previous environmental investigations, historical aerial photographs, topographic maps, regulatory agency databases and case files, and a visual reconnaissance of the alignment. No soil or groundwater samples were collected for this investigation.
- **Regulatory Database Search:** Regulatory agency databases were reviewed to determine regulatory agency actions regarding hazardous materials within 300 meters (984 feet) from the Doyle Drive construction limits.
- **Consultation with the Presidio Trust:** Additional information on environmental investigations and the current status of these areas of concern were collected by communication with Trust staff.

Potential Sources of Contamination

A review of the regulatory database records for PSI identified nine sites associated with hazardous materials within the projected construction limits. An additional 25 sites, called areas of concern, either use, store, or dispose of hazardous materials, or have had a reported release of hazardous materials. These 34 sites were evaluated in the PSI; following is a description of the ten sites within the immediate project area that were determined to have the greatest potential to affect development of the Doyle Drive Project. Locations are shown in **Exhibit 3-54**.

Responsibility for contamination related to historic Army operations was transferred from the Army to the Presidio Trust in a May 1999 agreement, although contamination associated with other sources, such as the Doyle Drive roadway and Golden Gate Bridge District operations, were not included in that agreement.

Exhibit 3-54
Hazardous Material Sites within the Study Area



1. Building 669 Area: Building 669 contained a former incinerator that was primarily used to burn animal carcasses from a nearby veterinary clinic. It may have also burned municipal waste. Ash generated from the burning operations was reportedly disposed on the hillside close the building. During CERCLA investigation of the site, lead was identified in soil at concentrations above Trust cleanup levels. The Trust performed remedial action at this site in 2008 in accordance with a DTSC-approved remedial action plan. DTSC closure approval is expected in mid-2009.

2. Doyle Drive Viaduct: An investigation of metals determined that total lead was the primary contaminant of concern. Six of the seven areas studied contained “hazardous” surface soils. The contamination at this site is understood to be a result of vehicle exhaust and sandblasting activities conducted by Caltrans, and not a result of historical Army land uses addressed in the 1999 agreement transferring responsibility for environmental cleanup at the Presidio to the Presidio Trust.

3. Sewer Lift Station #1: The sewer lift was used to pump waste water generated at the Presidio. During a CERCLA investigation of the site, cadmium, cobalt, lead, zinc, and selenium was identified in soil at concentrations above

Trust cleanup levels. The Trust performed remedial action at this site in 2008 in accordance with a DTSC-approved remedial action plan. DTSC closure approval is expected in mid-2009.

4. Building 633 Firing Range: Small arms were discharged from a firing line toward a backstop and target area. The concrete floor of the backstop and target area is overlain by sand. During CERCLA investigation of the site, antimony, arsenic, chromium, copper, lead, nickel, zinc, and benzo(a)pyrene were identified in soil at concentrations above Trust cleanup levels. The Trust performed remedial action at this site in 2008 in accordance with a DTSC-approved remedial action plan. DTSC closure approval is expected in mid-2009.

5. Commissary/PX Area: The Commissary/PX area historically contained a number of structures that constituted the Presidio Consolidated Motor Pool. Throughout 2000, the Trust conducted a series of investigations to identify and delineate the source of gasoline in the groundwater seeps at Crissy Field. Interim source removal activities, including the excavation of petroleum-affected soils, were conducted to address the groundwater seep contamination. During 2002 and 2003, two additional investigations were conducted to delineate petroleum contamination in this area. The Trust's *Corrective Action Plan* dated May 2006 was approved by the RWQCB on June 7, 2006. The *Corrective Action Plan* requires cleanup work to be completed in two phases and corrective actions consisting of the following components: excavation and removal of impacted soils, cover in place of impacted soils, and land use controls. The Trust performed remedial action at this site from 2006 to 2008. RWQCB closure approval is expected in early 2009.

6. Building 207/231 Area: Buildings 207 and 231 were former gasoline service stations on Halleck Street. Building 207 was located immediately north of Doyle Drive; Building 231 is located immediately south of the roadway. Underground storage tanks were removed from the Building 207 site in 1996; several tanks (including some solvent tanks) were removed from Building 231 from 1988 through 1996. Some contaminated soil and free-phase petroleum product were removed during the excavation. The Trust has prepared a revised *Corrective Action Plan* to address contamination at this site, which has been submitted to regulatory agencies for review. The revised *Corrective Action Plan* includes the following components: excavation and removal of impacted soil and cover in place of impacted soil and land use controls. The Trust proposes to perform the corrective actions at this site 2008 through 2010 in accordance with the RWQCB-approved corrective action plan.

7. Building 215 Area: The Building 215 area is the location of the former Burger King restaurant building in the Main Post area, and the historical location of a gasoline station and vehicle maintenance facility. The Army removed two underground storage tanks from this area in the late 1980s. In 2003, petroleum-affected soils were removed from this site. The site is proposed for no further remedial or corrective action.

8. Building 1065 Area: This is a former underground storage tank site, where petroleum hydrocarbons and associated volatile organic compounds have been identified in soils and groundwater. An interim cleanup was performed by the Trust in late 2003 and early 2004 to remove petroleum-contaminated soils. The Trust's *Corrective Action Plan* dated January 2007 was approved by the RWQCB on February 8, 2007. The *Corrective Action Plan* includes the following components: excavation and removal of impacted soil, cover in place of impacted soils, and land use controls. The Trust initiated corrective actions required by the corrective action plan in 2008, and expects to complete remediation in 2009.

9. Building 1167 Area: This building was historically used for furniture manufacturing, which included painting and staining. Elevated concentrations of arsenic and lead have been identified in a limited area of soils near the building. The Trust completed remedial action at this site in 2008 in accordance with a DTSC-approved remedial action plan. DTSC closure approval is expected in mid-2009.

10. Fill Site 6B: This site is a portion of a former Army landfill, which contains construction debris and soil from demolition of buildings in the Letterman Complex. In the late 1990s, the Army began the Remedial Investigation phase at this site, which will continue through 2009. Information from the investigations will be used to prepare a Corrective Action Plan, which will be subject to DTSC approval. Remedial action is expected to be performed in 2010 and 2011 in accordance with an approved DTSC Corrective Action Plan.

Temporary Impacts

The following discussion summarizes the potential temporary impacts associated with the alternatives. Because all alternatives are generally located within the same corridor, there is little variation between the alternatives.

Alternative 1: No-Build Alternative

There are no impacts associated with the No-Build Alternative because there would be no disturbance of sites potentially containing hazardous wastes. At present, soils in the viaduct area of Doyle Drive contain elevated levels of total lead, potentially from lead-based paint dust and aerially-deposited lead from vehicle exhaust. Elevated levels of lead could exist in shallow soils along the entire alignment if conditions were similar to those identified during investigation of the viaduct. These conditions would continue under the No-Build Alternative. Lead containment systems currently used during painting operations would continue to be used.

Alternative 2: Replace and Widen

All of the temporary impacts resulting from Alternative 2 are impacts which would also result from Alternative 5 and the Preferred Alternative. These mutual impacts are discussed below.

Alternative 5: Presidio Parkway

All of the temporary impacts resulting from Alternative 2 are impacts which would also result from Alternative 5 and the Preferred Alternative. These mutual impacts are discussed below.

Preferred Alternative: Refined Presidio Parkway

All of the temporary impacts resulting from Alternative 2 are impacts which would also result from Alternative 5 and the Preferred Alternative. These mutual impacts are discussed below.

Alternative 2: Replace and Widen, Alternative 5: Presidio Parkway, and Preferred Alternative: Refined Presidio Parkway

Thirty-four sites within the study area that use, store, dispose of, or have released hazardous materials were identified in regulatory agency databases and other sources. Except for nine sites located within the projected construction area, and an additional gun firing range still under evaluation, all areas of concern within or near the construction limits were evaluated as having no potential to affect the built alternatives based on the extent of contamination defined in previous investigations and the status of remedial activities. Depending on the timing of remedial efforts currently proposed by the Trust, remediation of some of the remaining sites at the Presidio may be completed prior to construction of any build alternatives for Doyle Drive while some sites may not. There is the potential that hazardous materials would be encountered during the construction period and would require appropriate disposal. Any hazardous materials encountered during construction of the Doyle Drive Project would be handled in accordance with state and federal regulations following the procedures described in Avoidance, Minimization and/or Mitigation Measures later in this section. Appropriate remediation of potential hazardous materials will ensure that there is no unacceptable environmental, human health, or financial risks associated with the Project.

Based on available information, the following types of impacts are anticipated during construction:

Exposure to Historic Hazardous Materials and Existing Aerially-Deposited Contaminants

Construction of the Doyle Drive build alternatives may expose construction workers to hazardous concentrations of metals and other contaminants from aerially-deposited lead, viaduct coatings, and historic hazardous materials releases along the project site. Potential means of worker exposure to hazardous materials and wastes include inhalation, ingestion, or skin contact. Contaminated soils may also have the potential to be entrained in stormwater runoff, which is evaluated in Section 3.3.1 of this document (Hydrology, Water Quality, and Stormwater).

Exposure to Naturally-Occurring Asbestos

Construction of the Doyle Drive build alternatives may expose construction workers to hazardous concentrations of naturally-occurring asbestos present in serpentinite bedrock. Intact bedrock itself poses no risk factor. Drilling, excavation, and removal of serpentinite could expose workers to airborne asbestos.

Exposure to and Disposal of Contaminated Groundwater

Construction dewatering may potentially discharge contaminated groundwater to sanitary and/or storm sewers, potentially affecting surface water quality. Hexavalent chromium, petroleum hydrocarbons, arsenic, barium, lead, nickel, and benzene have been detected in water samples at localized areas within the Presidio.

Exposure to Building Demolition Hazardous Materials

Demolition of structures for development of the Doyle Drive build alternatives may expose construction workers, park visitors, and nearby workers and residents to hazardous concentrations of lead and/or asbestos from building materials. Lead oxide and lead chromate were commonly used in paints until 1978, when regulations limited the allowable lead content in paint. Therefore, interior and/or exterior painted surfaces at buildings constructed prior to 1978 have the potential to contain lead-based paint. Lead-based paint surveys have been conducted by the Army at family housing buildings at the Presidio, but none are known to have been completed for buildings likely to be affected by the Doyle Drive build alternatives.

Asbestos was commonly used in construction materials until the 1980s, when its use was phased out. Therefore, building materials manufactured prior to the 1980s have the potential to contain asbestos fibers, which may be released during demolition activities. A base-wide asbestos survey was performed for the Army in 1989. Identified materials containing friable asbestos (asbestos that can be released by hand pressure) were abated by the Army, but most materials containing non-friable asbestos were left in-place. Caltrans has estimated that 80 percent of the buildings adjacent to Doyle Drive contained asbestos.

Project Interference with Presidio Remediation Actions

Construction of the Doyle Drive build alternatives may potentially interfere with the investigation and remediation of hazardous material sites at the Presidio.

Permanent Impacts

Any impacts related to the use and transport of hazardous materials or the disturbance of hazardous waste sites may be limited to the construction period. Although a release of hazardous materials during the construction period may potentially have long-lasting effects, construction-phase mitigation measures will be implemented to address this potential issue. Therefore, no permanent impacts are anticipated.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. A number of procedures will be performed prior to construction. Although the nature and likely extent of hazardous materials issues have been defined through previous investigations along the project alignment, remedial costs related to these issues will be defined during additional pre-construction investigations, and the soils, groundwater, and buildings to be affected by the project are determined. The estimated remediation costs for aerially deposited lead (ADL) is \$3.2 million based on the removal of the top 0.6 meters (two feet) of soil within the construction corridor. The estimated allowance for serpentinite remediation is \$6.2 million which is based on the costs associated with the excavation of serpentinite bedrock for the structures in the Park Presidio Interchange area. An additional allowance of \$5.6 million is included for the disposal of additional hazardous materials which may be encountered in areas of potential contamination. The costs and allowances for remediation are based on the updated project cost estimates for the Preferred Alternative. As discussed below, additional soil investigations will be performed during final design to determine the extent of potential hazardous materials. The following discussion identifies the process and procedures for dealing with hazardous materials.

Identify/Eliminate Additional Areas of Concern Along Doyle Drive Alignment

A soil investigation will be performed prior to project construction to determine if aerially deposited metals from vehicle exhaust and viaduct coating have affected shallow soils near Doyle Drive. Samples will be collected from surface soils in areas that will be disturbed during project construction. Soil samples will be analyzed for total lead and other contaminants of concern. Analytical results will be compared to cleanup levels established by the Trust in the *Revised Feasibility Study* (see Appendix C in the revised *Preliminary Site Investigation*, October 2004), the *Petroleum Contingency Plan* (Erler & Kalinowski, 2004), and the *The Development of Presidio-Wide Cleanup Levels for Soil, Sediment, Groundwater and Surface Water* (Erler & Kalinowski, 2002, commonly referred to as the *Presidio Cleanup Level Document*). Depending on the analytical results, special soil management and disposal procedures may be required, and/or additional construction worker health and safety procedures implemented during project construction.

Develop a Site Management Program/Contingency Plan

Prior to project construction, a *Site Management Program/Contingency Plan* (SMP/CP) will be prepared to address known and potential hazardous material issues during construction. The SMP/CP will incorporate Trust Land Use Controls and other applicable Trust protocols for construction at and near hazardous materials sites. If project construction will affect areas under active regulatory oversight, the SMP/CP will require regulatory agency approval to ensure that measures are compatible with ongoing remedial efforts.

The SMP/CP will include available data from environmental investigations and geotechnical borings from the project area, including areas of serpentinite bedrock that will be disturbed during construction. The SMP/CP will describe standard Caltrans construction specifications addressing hazardous materials management and will include additional measures as required to address management of contaminated soil and groundwater from known hazardous materials sites. For soils, the SMP/CP will include stockpile handling/management procedures, stockpile sampling methodology (including analytical methods, sampling frequency, and statistical analysis), and off-haul and reuse criteria. Reuse criteria will be those criteria developed by the Trust for the *Revised Feasibility Study*. Any management of Low Temperature Thermally Desorbed (LTTD) soils shall be in accordance with established Trust protocols. For groundwater, the SMP/CP will describe groundwater storage and discharge requirements, which may include pre-treatment of dewatered groundwater and other permit requirements.

The SMP/CP will include a site-specific *Health and Safety Plan* (HASP) prepared by a qualified environmental professional. The HASP should include measures to protect construction workers and the general public by including engineering controls, monitoring, and security measures to prevent unauthorized entry to the construction area, and reduce hazards outside it. If prescribed exposure levels will be exceeded, personal protective equipment will be required for workers in accordance with California Division of Occupational Safety and Health (DOSH) regulations.

The SMP/CP will also address the possibility of encountering unknown contamination or buried hazards and include procedures to protect workers and the public. This portion of the SMP/CP will be similar in scope to and consistent with the *Petroleum Contingency Plan* prepared by the Trust, and will include procedures for addressing both petroleum and non-petroleum contaminants. The SMP/CP will also include emergency procedures for accidental releases of hazardous materials used or stored during construction.

Identify Potential Serpentinite Bedrock Disturbance Areas

Prior to project construction, previously-prepared geotechnical reports and boring and trenching logs from the site will be reviewed to identify areas of serpentinite bedrock that will be disturbed during project construction. An *Asbestos Dust Mitigation Plan* will be prepared and submitted to BAAQMD, in accordance with the *Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations*. The *Asbestos Dust Mitigation Plan* will include *Best Management Practices* (BMPs) to minimize dust during grading and other earthmoving operations. BAAQMD will also be notified at least 14 days prior to construction activities at the site.

Identify Groundwater Dewatering Areas and Develop Testing/Treatment Protocol

During geotechnical examinations, in areas slated for dewatering, groundwater samples will be tested for hexavalent chromium, petroleum hydrocarbons, and

possibly other contaminants. When groundwater dewatering is required during project construction, a permit from SFRWQCB and/or the San Francisco Public Utilities Commission (SFPUC) will be required. Permit conditions could potentially include discharge volume limits, discharge mass limits for specific contaminants, and/or pre-treatment of groundwater prior to discharge. Dewatering near Halleck Street prior to the completion of remediation in the Building 207/231 area may require a water treatment system to remove organic compounds related to historic releases in that area.

Project construction will use techniques to minimize the amount of groundwater dewatering; therefore, the limited dewatering performed during construction will not create long-term changes in groundwater flow direction or velocity and will not be expected to drastically affect other areas of groundwater contamination at the Presidio.

Identify Building and Demolition Hazards

Prior to the start of major construction and demolition of buildings for project construction, a lead-based paint survey and asbestos-containing materials survey will be conducted. Identified lead and asbestos will be abated prior to building demolition in accordance with applicable regulations. All lead and asbestos abatement activities must be conducted by trained workers under direction of an appropriate health and safety plan to minimize potential exposure. Soils near structures potentially affected by lead-based paint will be investigated and remediated, if warranted, in accordance with the *Presidio-Wide Lead-Based Paint in Soil Plan* (Treadwell & Rollo, Inc., 2003).

Coordinate Construction with On-going Remediation Actions

All construction activities will be coordinated with the Trust to ensure that project development does not affect on-going investigation and/or remediation of hazardous materials sites. For those sites where Caltrans is not the responsible party (i.e., CERCLA or petroleum contamination sites at the Presidio where the Army has been identified as the responsible party), and avoidance of the site is not possible, Caltrans' policy is to "make every effort to have the owner and/or responsible party investigate and cleanup the contamination prior to acquisition" (*Caltrans Project Development Procedures Manual*, Chapter 8, Article 1).

In 1999, the Presidio Trust Board of Directors approved the execution of a Memorandum of Agreement among the Army, the Department of the Interior, National Park Service (the "DOI") and the Presidio Trust (the "Presidio MOA") and a Memorandum of Agreement between the Presidio Trust and the DOI (the "Area A Agreement"), whereby the Presidio Trust assumed responsibility for performing all actions necessary to accomplish environmental remediation of certain enumerated sites (as defined in the Agreements). The Presidio MOA provided that the Army would transfer one hundred million dollars (\$100,000,000) to the Presidio Trust to fund the cleanup of the enumerated sites and the Army would retain responsibility for the cleanup of unknown contamination (as defined in the Agreements). Further, the Presidio

Trust negotiated insurance policies underwriting the risks of environmental remediation cost overruns and the presence of unknown contamination.

Based on these agreements, the Presidio Trust is responsible for only remediating known contamination related to historic Army land uses at certain enumerated sites. Any further remediation activities will be carried out by the responsible parties as required by appropriate state and federal regulations and regulatory authorities. Any hazardous materials encountered during the course of the project, for which neither the Army nor Presidio Trust are the responsible agencies, will be appropriately handled by Caltrans and SFCTA in accordance with state and federal regulations.

If, as a result of the Doyle Drive project, soil is excavated within a site previously remediated by the Presidio Trust in accordance with a remedy approved by the lead regulatory agency, the replacement of any engineering site controls required by the lead regulatory agency as a condition of site closure would be incorporated into the project. The Presidio Trust will coordinate future environmental remediation proposed in the project corridor with Caltrans and SFCTA.

3.3.4 Air Quality

This section presents a summary of air quality conditions within the existing Doyle Drive Project study area. Detailed information regarding methodology and findings can be found in the *South Access to the Golden Gate Bridge: Doyle Drive Project Revised Air Quality Study*, November 2004.

Regulatory Setting

The *Clean Air Act* as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the *California Clean Air Act* of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called *National Ambient Air Quality Standards* (NAAQS). Standards have been established for carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃) and particulate matter (PM₁₀ and PM_{2.5}). These standards are shown in **Exhibit 3-55**.

Under the *1990 Clean Air Act Amendments*, the U.S. Department of Transportation (USDOT) cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to the *Clean Air Act* requirements. Conformity with the *Clean Air Act* takes place on two levels: at the regional level and at the project level. The proposed project must conform at both levels to be approved.

The *California Clean Air Act* (CCAA), which became effective on January 1, 1989, provides a planning framework for attainment of California Air Quality Standards. Local air quality agencies in violation of state ambient air quality standards are required to prepare plans for attaining the state standards. The California Air Resources Board (CARB) coordinates and oversees the activities

of California's many local air quality agencies. The CARB has established state ambient air quality standards, many of which are more stringent than the corresponding NAAQS (see **Exhibit 3-55** for a comparison of the standards).

Exhibit 3-55
Summary of Monitoring Data for San Francisco
(Arkansas Street Monitoring Station), 2000–2003

POLLUTANT	STATE STANDARD	NATIONAL STANDARD	POLLUTANT CONCENTRATION YEAR			
			2000	2001	2002	2003
OZONE						
Highest 1-hour average, ppm ^a	0.09	0.12	0.06	0.08	0.05	0.08
Days over State Standard			0	0	0	0
Days over National Standard			0	0	0	0
Highest 8-hour average, ppm	NA	0.08	0.04	0.05	0.05	0.06
Days over National Standard			0	0	0	0
CARBON MONOXIDE						
Highest 8-hour average, ppm	9.0	9	3.2	3.3	2.6	2.8
Days over Standard			0	0	0	0
RESPIRABLE PARTICULATE MATTER (PM₁₀)						
Highest 24-hour average, µg/m ³ ^a	50	150	63	70	74	52
Number of samples ^b			61	61	61	61
Days over State Standard			2	8	4	1
Days over National Standard			0	0	0	1
Annual average, µg/m ³	30	50	22	26	25	22
FINE PARTICULATE MATTER (PM_{2.5})						
Highest 24-hour average, µg/m ³	-	35 ^c		77	70	42
Days over National Standard				2	4	1
Annual Average, µg/m ³	12	15		12	13	10

Source: California Air Resources Board, *Summary of Air Quality Data, Gaseous and Particulate Pollutants, 2000–2003*.

Notes: NA = Not Applicable or Not Available.

^a ppm = parts per million; µg/m³ = micrograms per cubic meter.

^b PM₁₀ is not measured every day of the year. The number of samples refers to the number of days in a given year during which PM₁₀ was measured at Arkansas Street monitoring station.

^c USEPA, National Air Quality Standards for Particulate Matter; Final Rule, 40 CFR Part 50, October 17, 2006.

Regional level conformity is concerned with how well the region meets the standards set for the pollutants listed above. *Regional Transportation Plans* (RTP) are developed and include all of the transportation projects planned for a region over a period of 20 years. An air quality model is based on the projects included in the RTP, to determine whether or not the implementation of those projects would result in a violation of the *Clean Air Act*. If no violations would occur, then the regional planning organization (for this project, the Association of Bay

Area Governments), and the appropriate federal agencies, such as the FHWA, make the determination that the RTP is in conformity with the *Clean Air Act*. Otherwise, the projects in the RTP must be modified until conformity is attained.

Project level conformity is also required. If a region is meeting the standard for a given pollutant, then the region is said to be in “attainment” for that pollutant. If the region does not meet the standard, then it is designated a “non-attainment” area for that pollutant. Areas previously designated as non-attainment areas that have recently met the standard are called “maintenance” areas. If a project is located in a non-attainment or maintenance area for a given pollutant, then additional air quality analysis and reduction measures in regard to that pollutant is required. This is most frequently done for CO and PM₁₀/PM_{2.5}.

The Metropolitan Transportation Commission (MTC) prepares and adopts the *Transportation Improvement Plan* (TIP) every two years. The proposed project was included in the most recent TIP and subsequent amendments in 2007 (the 2007 TIP), as approved by the FHWA on October 2, 2006. The Doyle Drive Project is included in the Draft 2009 TIP.

On February 23, 2005, the MTC issued a final transportation air quality conformity finding for the *Transportation 2030 Plan* and the 2005 *TIP/Amendment #05-05*. The FHWA and FTA approved this air quality conformity finding on March 17, 2005. Since the design concept and scope of the project has not changed, the project still conforms to the *State Implementation Plan* (SIP).

General Study Area Conditions

On April 22, 2004, the U.S. Environmental Protection Agency (EPA) declared the San Francisco Bay Area as attainment for the national one-hour ozone standard. It would not officially be reclassified until the Bay Area Air Quality Management District (BAAQMD) submits a plan demonstrating how the area would maintain the standard for the next ten years. In June 2004, the Bay Area was designated as a marginal nonattainment area for the newly adopted national eight hour ozone standard.

In 1998, the EPA redesignated a subregion of the Bay Area, referred to as the urbanized area, from nonattainment to attainment for the national CO standard (EPA, 1998a). At the same time, EPA approved a “maintenance” plan, which shows how the subregion would continue to maintain the standard. The subregion is now designated as a “maintenance area” for the national CO standard.

The Bay Area is currently designated as nonattainment for state standards for ozone, PM_{2.5} and PM₁₀ and is attainment or unclassified for the other state standards (CARB, 1999).

The Bay Area is in attainment of the national annual average PM₁₀ standard and is unclassified for the national 24 hour PM₁₀ standard. With regard to the newly

adopted national PM_{2.5} standards, the Bay Area is unclassified for both the annual average and 24 hour average standards. The BAAQMD has set up a PM_{2.5} monitoring program to determine the attainment status in the region of the unclassified pollutant.

The BAAQMD periodically prepares and updates plans to achieve the goal of healthy air. Air quality plans usually include reduced air pollutant emissions from industrial facilities, commercial processes, motor vehicles and other sources. Bay Area plans are prepared with the cooperation of the MTC, and the Association of Bay Area Governments. The most recent plans are the *2002 Ozone Attainment Plan* and the *2000 Clean Air Plan*.

In addition to these standards and regulations, regional plans also dictate air quality criteria and goals.

National Park Service and Presidio Trust Air Quality Policy

The National Park Service (NPS) and the Presidio Trust provide additional emphasis on air quality. While there are no existing national or state air quality standards that are specific to the Presidio or national parks, the following lists the titles of existing NPS policies set forth in its Director's Orders and Executive Orders which provide general policy direction in promoting cleaner air quality:

- *Director's Order 13A - Environmental Management Systems*
- *Executive Order No 13031 – Federal Alternative Fueled Vehicle Leadership*
- *Executive Order No. 13123 - Greening the Government through Efficient Energy Management;*
- *Executive Order No. 13148 - Greening the Government through Leadership in Environmental Management; and*
- *Executive Order No. 13149 - Greening the Government through Federal Fleet and Transport Efficiency.*

Affected Environment

The project area lies within the city and county of San Francisco, at the northern end of the peninsula climatological sub-region of the San Francisco Bay Area Air Basin (Bay Area). Because most of San Francisco's topography is below 61 meters (200 feet), marine air is able to flow easily across most of the city, making its climate cool and windy. Pollutant emissions in San Francisco are high, especially from motor vehicle congestion. Localized pollutants, such as CO, can build up in "urban canyons." However, winds are generally strong enough to carry the pollutants away before they can accumulate (BAAQMD, 1999).

Criteria Air Pollutants

BAAQMD operates a regional air quality monitoring network that provides information on ambient concentrations of criteria air pollutants, including ozone, CO, and PM₁₀, the three pollutants of most concern in the Bay Area. The

nearest ambient air monitoring station to the project site is the Arkansas Street monitoring station in San Francisco.

Ozone

Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production. As shown in **Exhibit 3-55**, the local monitor has not recorded exceedances of the state ozone standard over the past four years.

Carbon Monoxide

Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. **Exhibit 3-55** shows that no exceedances of CO standards have been recorded by the local monitoring station over the past four years. CO emissions are expected to decrease by approximately 33 percent from 2000 to 2010 (BAAQMD, 1999) and thus background CO concentrations are expected to continue to be less than the corresponding standards for the foreseeable future.

Particulate Matter

Respirable particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}) consist of particulates ten microns (a micron is one one-millionth of a meter) or less in diameter and 2.5 microns or less in diameter, respectively. PM_{2.5} can be inhaled deeply into the lungs and cause adverse health effects. Particulate matter in the atmosphere, result from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of these operations, such as demolition and construction activities, primarily contribute to increases in local particulate concentrations, while others, such as vehicular traffic, affect regional particulate matter concentrations.

PM₁₀, and ambient air concentrations from 2000 to 2003 at the local monitoring station on Arkansas Street are reported in **Exhibit 3-55**. The data show that there were no exceedances of the federal PM₁₀ standard, and approximately five percent of the time, the more stringent state standard is exceeded. The Arkansas Street monitoring station is in an urban setting, and is between two freeways (U.S. 101 and I-280). These measured levels are consistent with the regional monitoring network which is representative of urban areas. Levels in the Doyle Drive Project study area would be lower than the Arkansas Street location, as they are not downwind of major sources of pollution.

PM_{2.5} data is also reported in **Exhibit 3-55** for 2000-2003. In spite of the two high 24-hour readings in 2001 and 2002 for the Arkansas Street monitor in San Francisco, the Bay Area is designated as attainment for the PM_{2.5} National Ambient Air Quality Standard. Attainment designations are based on a three-year average of 98th percentile values from a monitor called a design value. Of all

the monitors in a region, EPA uses the one with the highest design value as the basis for designations.

To obtain the design value for a particular monitor, the value that exceeds 98 percent of all observed values (i.e., the 98th percentile value) is taken from each of the three years being considered and averaged together. Thus, for San Francisco the monitor recorded a peak reading, but the majority of values recorded were below the 24 hour standard.

Under the *Clean Air Act*, ambient air quality must meet the standards for criteria pollutants in all locations generally accessible to the public; however, some land uses are considered more sensitive than others. Schools, parks, hospitals and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people or the infirmed frequent these areas and are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also sensitive to poor air quality.

Sensitive receptors within the Doyle Drive Project study area include:

- Open spaces of the Presidio;
- Crissy Field;
- Serra Preschool and Bay School; and
- Residential areas along and in the vicinity of Armistead Road (northwest of the junction of Highway 1 and Doyle Drive), Storey Avenue (north of Ruckman Avenue), Riley Avenue, and Girard Road.

Sensitive receptors adjacent to the project area:

- Sibert Loop (west of Arguello Boulevard);
- Sumner Street (west of Presidio Boulevard);
- The Ruckman Avenue residential area;
- The residential area along Hitchcock Street (immediately west of Highway 1);
- The residential area along Amatory Loop (east of Park Boulevard);
- The residential area along Wyman Avenue (near the southern boundary of the Presidio);
- Residences immediately east of the Palace of Fine Arts;
- Residences along the south side of Marina Boulevard;
- Residences along the east side of Lyon Street, north of Lombard;
- Residences along both sides of Richardson Avenue;
- Presidio Child Development Center; and
- Lone Mountain Children's Center.

Temporary Impacts

The construction-related air quality impacts analysis follows the methodology recommended by *BAAQMD Guidelines*. The *Guidelines* recommend a qualitative

approach to evaluating construction-phase impacts with the emphasis placed on identifying and implementing an adequate dust abatement program rather than on quantification of related emissions or ambient air concentrations. BAAQMD provides a recommended list of measures to minimize emissions during construction activities, and the air quality analysis relies on the list to develop measures appropriate for this Project.

Alternative 1: No-Build

The No-Build Alternative would not result in any construction activities, therefore there are no temporary impacts.

Alternative 2: Replace and Widen

Temporary impacts resulting from Alternative 2 are the same for all build alternatives. Impacts are discussed below.

Alternative 5: Presidio Parkway

Temporary impacts resulting from Alternative 5 are the same for all build alternatives. Impacts are discussed below.

Preferred Alternative: Refined Presidio Parkway

Temporary impacts resulting from the Preferred Alternative are the same for all build alternatives. Impacts are discussed below.

Alternative 2: Replace and Widen, Alternative 5: Presidio Parkway, and Preferred Alternative: Refined Presidio Parkway

The construction period for the Doyle Drive Project will be approximately 4 to 5 years. Construction will occur in phases. The build alternatives will involve standard construction techniques and require large-scale construction equipment and labor intensive activities.

Construction activities will generate emissions of criteria pollutants. Dust emissions will vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. In the absence of standard mitigation techniques, construction activities may result in substantial quantities of dust, and as a result, local visibility and PM₁₀ concentrations may be adversely affected on an intermittent basis during construction. Dust generated by construction will include not only PM₁₀, but also larger particles, which will fall out of the atmosphere within several hundred feet of the site and could result in nuisance-type impacts.

Construction activities will also result in the emission of other criteria pollutants from equipment exhaust, construction-related vehicular activity and construction worker automobile trips. Emission levels for construction activities will vary depending on the number and type of equipment, duration of use, operation schedules, and the number of construction workers. The impact of these

emissions will contribute to local air quality degradation in the area, but will be minor and temporary.

Permanent Impacts

The air quality impact analysis for long-term roadway operations addresses changes in regional emissions and changes in local air pollutant concentrations of CO. With respect to regional emissions, the San Francisco Bay Area is a nonattainment area for the state and national eight-hour ozone standard and a nonattainment area for the state PM₁₀ standard. Future emissions from the Doyle Drive Project have already been incorporated by the MTC into the most recent regional air quality conformity analysis. Consequently, regional emissions from the Doyle Drive Project will not contribute to exceedances of the national ozone standard.

With regard to local impacts of CO, a hot spot analysis²⁵ was conducted to determine if any of the build alternatives will cause or contribute to any localized CO violations near key intersections.²⁶

Tunnel portals were analyzed, in which maximum concentrations of CO in the tunnel ventilation system were considered to determine impacts. These maximum concentrations exiting the portals were modeled using the EPA dispersion model SCREEN3 to estimate downwind concentrations.

Based on the model's results, the following potential impacts were identified.

Alternative 1: No-Build

The No-Build Alternative would not result in any permanent impacts.

Alternative 2: Replace and Widen

All of the permanent impacts resulting from Alternative 2 are impacts which would also result from Alternative 5 and the Preferred Alternative. These mutual impacts are discussed later in this section.

Alternative 5: Presidio Parkway (tunnel portion)

This Alternative proposes to use two tunnels with lengths of approximately 240 meters and 315 meters (787 and 1,033 feet). The FHWA and EPA require that tunnels be designed to limit CO concentrations to certain levels in order to protect public health (Caltrans, 2000). CO concentrations are allowed to

²⁵ A hot spot analysis is a study which is performed at key roadway intersections to determine if air quality standards are being (or will be) met.

²⁶ The analysis uses the Project-Level Protocol developed jointly by Caltrans and the Institute of Transportation Studies, University of California at Davis and approved by EPA for use in the Bay Area. A top-down approach was followed, in which the intersection with the worst-case traffic levels and congestion was first analyzed. If, from the worst-case analysis, it is determined that CO concentrations do not exceed the ambient air standards, then it can be assumed that other intersections affected by the project, but with lower traffic counts and less congestion would also result in worst-case concentrations that are well below the standards and would not have to be analyzed.

approach a maximum 15 minute average concentration of 120 ppm (parts per million) or 35 ppm for a one-hour average within a tunnel, provided there are no pedestrians or bicycles allowed; otherwise, the 15 minute average limit is 60 ppm. Pedestrians and bicyclists would be prohibited on Doyle Drive; hence, the higher limits would be adhered to.

Emergency ventilation systems that would provide air and limit pollution concentrations within the tunnel to acceptable levels in the event of a vehicular accident or fire would be included in the design of this alternative. This emergency ventilation system would consist of a series of jet fans. Under normal operating conditions, the tunnel would be self-ventilating due to the piston-effect of vehicles for certain tunnel variations.

The greatest impacts outside the tunnels would be from emissions at the exit and entry portals. A modeling analysis of emissions from the tunnel portals was carried out to estimate maximum downwind concentrations. A screening modeling analysis predicted that maximum one hour CO concentrations at downwind locations would be no greater than 11 ppm. This level is well below the state and federal one-hour standards. Thus, the impact would be minor.

Preferred Alternative: Refined Presidio Parkway (tunnel portion)

The impact of the Preferred Alternative tunnel portion will be the same as that described above for Alternative 5.

Alternative 2: Replace and Widen, Alternative 5: Presidio Parkway, and Preferred Alternative

Permanent impacts which will result from the build alternative are discussed in this section. These impacts are the only air quality impacts identified for Alternative 2.

Regional Air Quality

During project operations, changes in traffic in the design year of 2030 are compared with the No-Build Alternative in the design year and with existing baseline conditions (2000) to determine if emissions will change and cause impacts on air quality. **Exhibit 3-56** summarizes the peak-hour vehicle miles traveled (VMT) for the various alternatives.

Exhibit 3-56 indicates that, although traffic volumes will increase by the design year as compared with existing conditions, VMT for all alternatives will be similar. Differences in VMT are attributable to the minor variations in alternative roadway configurations. There will be no air quality impacts for any of the alternatives when compared with the future No-Build Alternative. Although VMT for future years are greater than existing conditions for all of the alternatives, any emissions changes associated with the increased VMT have already been included in the 2003 TIP, and those emissions conform to the *Regional Clean Air Plan*.

Exhibit 3-56
Estimated Vehicle Miles Traveled at Peak Times

SCENARIO	VEHICLE MILES TRAVELED	
	AM PEAK	PM PEAK
2000 Base	61,500	69,600
2030 No-Build	69,500	77,400
2030 Replace and Widen	69,600	78,800
2030 Presidio Parkway Diamond Option	70,400	79,500
2030 Presidio Parkway Circle Option	70,200	79,400
2030 Preferred Alternative	70,400	79,500

Local Air Quality

CO

Project-related traffic may result in localized “hot spots.” Although the Doyle Drive Project alternatives are expected to have similar VMT, the change in route configurations may cause CO impacts to increase at key receptors.

The CO analysis utilizes the Project-Level CO Analysis Protocol developed jointly by Caltrans and the Institute of Transportation Studies, University of California at Davis. The protocol is based on the fact that the Bay Area meets air quality standards for CO, and it allows a qualitative approach for determining air quality impacts. In this approach, the highest traffic volume related to the Project is compared to the traffic volume on another artery in the area where the CO levels are not exceeded. In this case, existing Route 101 between Story Road and Tully Road in Santa Clara County (224,000 vehicles per day) is compared to the highest traffic volume related to the Project, which is Route 101 between Merchant Drive Ramps and Veterans Boulevard (83,000 vehicles per day). Since traffic volume related to the Project is much smaller, the Project will meet air quality standards and will therefore have no impacts on local air quality or cause exceedances of state or federal standards.

PM2.5 and PM10

In March 2006, the EPA published a final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in PM2.5 and PM10 nonattainment and maintenance areas (71 FR 12468). Pursuant to Section 1.3 of the U.S. EPA and FHWA jointly-released *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas*, the Project will not be considered a “project of air quality concern.” This is primarily because the Project will result in a very small increase in vehicles miles traveled (< 2.5 percent) over the Future No Project scenario (see **Exhibit 3-56**, above), and the Project will result in improved traffic flow and vehicle speeds and will

result in decreases in idling, and thus, the Project will have a “neutral or positive” influence on PM2.5 or PM 10 emissions. Accordingly, the Project would not be subject to a qualitative PM2.5 or PM10 hot spot analysis.

Air Toxics

The *Clean Air Act* identified 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list of toxics and identified a group of 21 as mobile source air toxics, which are set forth in an EPA final rule, *Control of Emissions of Hazardous Air Pollutants from Mobile Sources* (66 FR 17235). The EPA also extracted a subset of this list of 21 that it now labels as the six priority Mobile Source Air Toxics (MSATs). These are benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. While these MSATs are considered the priority transportation toxics, the EPA stresses that the lists are subject to change and may be adjusted in future rules.

In February 2006, the FHWA released the *Interim Guidance on Air Toxic Analysis in NEPA Documents*, which provided guidance on when and how to analyze Mobile Source Air Toxics (MSAT) in the NEPA process for highways. Pursuant to the *Interim Guidance*, the Doyle Drive Project would be considered in the category of “Exempt Project or Projects with no Meaningful MSAT Effects.” This Project will have no meaningful impact on traffic volumes (less than 2.5 percent increase over Future No Project scenario - see **Exhibit 3-56**, above) or vehicle mix, and traffic will flow more freely with less idling. Accordingly, no analysis or discussion of MSATs is required. As such, FHWA has determined that this project will generate minimal air quality impacts for *Clean Air Act* criteria pollutants and has not been linked with any special MSAT concerns. Consequently, this effort is exempt from analysis for MSATs.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. Even after accounting for a 64 percent increase in VMT, FHWA predicts MSATs will decline in the range of 57 percent to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in VMT. This will both reduce the background level of MSATs as well as the possibility of even minor MSAT emissions from this project.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. During construction, the contractor will be required to mitigate potential impacts by implementing BAAQMD’s basic dust control procedures, and to maintain project construction-related impacts at acceptable levels. These mitigation measures are identified in the *BAAQMD Guidelines* (BAAQMD, 1999). Elements of the dust abatement program for this project will include, as applicable, but may not be limited to the following:

- Water all active construction areas at least twice daily. Watering could be sufficient to prevent airborne dust from leaving the site. Increased watering frequency may be necessary whenever wind speeds exceed 24 kilometers per hour (15 miles per hour).
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 0.6 meter (two feet) of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer).
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep streets (with water sweepers using reclaimed water if possible) at the end of each day if visible soil material is carried onto adjacent paved roads.

In addition to these mitigation measures, there will be additional PM and NO_x emission reductions for future construction equipment, since on May 11, 2004, the EPA signed the final rule introducing Tier 4 emission standards, which are to be phased-in over the period of 2008-2015 [69 FR 38957-39273, 29 June 2004]. The Tier 4 standards require that emissions of PM and Nitrogen Oxides (NO_x) be further reduced by about 90 percent. Such emission reductions are to be achieved through the use of control technologies similar to those required by the 2007 to 2010 standards for highway engines. To enable sulfur-sensitive control technologies in Tier 4 engines—such as catalytic particulate filters and NO_x absorbers—the EPA mandated reductions in sulfur content in non-road diesel fuels are as follows:

- 500 ppm effective June 2007 for non-road (construction), locomotive and marine (NRLM) diesel fuels; and
- 15 ppm (ultra-low sulfur diesel) effective June 2010 for non-road fuels.

Implementation of this regulation will serve to reduce NO_x, Volatile Organic Compound (VOC), and toxic PM₁₀ emissions.

With implementation of the proposed construction mitigation measures, project compliance with all applicable regulations for reducing air emissions will be generally consistent with the NPS Director's and Executive Order's for promoting cleaner air quality.

3.3.5 Noise and Vibration

This section discusses the existing conditions and potential impacts related to noise and vibration.

Noise

This section describes the existing noise environment in the Doyle Drive Project study area and the results of detailed studies to predict future noise levels. Information for this section has been extracted from the *South Access to the Golden*

Gate Bridge: Doyle Drive Project: Final Noise and Vibration Study, December 2004. An addendum to the December 2004 *Final Noise and Vibration Study* was prepared in October 2006 to assess the potential impacts of the Preferred Alternative and the Temporary Construction Detour (TCD). This revised information has been incorporated into the impacts discussion of this section.

Regulatory Setting

The Doyle Drive Project is subject to the requirements of the *National Environmental Policy Act* (NEPA) and the *California Environmental Quality Act* (CEQA). These laws provide the basis for analyzing and abating the effects of highway traffic noise and construction noise. In addition to the federal and state requirements, the project must take into consideration noise standards for the city of San Francisco, the National Park Service (NPS), and the Presidio Trust (the Trust).

Federal Standards

The standard for the Federal Highway Administration (FHWA) is Title 23, Part 772 of the *Code of Federal Regulations*. 23 CFR 772 provides the framework for analyzing traffic noise impacts. Under 23 CFR 772, noise abatement must be considered when the construction of a highway project would cause either of the following:

- a substantial increase in noise; or
- predicted noise levels that would approach or exceed Noise Abatement Criteria (NAC).

The Caltrans *Traffic Noise Analysis Protocol* defines substantial as an increase in the existing noise levels by 12 dBA, Leq (h), and defines approach as being within 1 dBA of the federal criteria. The term dBA refers to A-weighted decibels, the unit of measure used to express environmental sound. Leq(h) refers to the energy-average of the A-weighted sound levels occurring during a one-hour period.

Exhibit 3-57 (on the following page) shows typical noise levels found in our everyday environment and their effect on the human ear.

The NAC, established by FHWA, is designed to identify traffic noise levels, based on the land use category, that require consideration of abatement. Land use is a consideration in analyzing noise impacts of a project. For example, the NAC noise level for residences (67 dBA) is lower than the level for commercial areas (72 dBA).

Exhibit 3-58 (on the following page) shows the NAC for various land uses. In instances when the project would cause a substantial increase in noise or cause noise levels to approach or exceed the NAC, noise abatement measures must be considered for inclusion in the project, if the measures are found to be reasonable and feasible.

**Exhibit 3-57
Everyday Noise Levels**

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL dBA	COMMON INDOOR ACTIVITIES
Jet Fly-over at 300 m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	90 80	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft) Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	30	Library Bedroom at Night Concert Hall (Background)
	20	Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

**Exhibit 3-58
Activity Categories and Noise Abatement Criteria**

CATEGORY	NAC, HOURLY A- WEIGHTED NOISE LEVEL, dBA $L_{eq}(h)$	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	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Leq (h): The highest one-hour average noise level caused by motor vehicle traffic over the course of a 24-hour day. Depending on average speeds during the peak (traffic) periods, the Leq(h) may or may not coincide with the peak traffic hour.

State Standards

Under CEQA, a substantial noise increase may result in a significant adverse environmental effect and must be identified as a noise impact. A substantial increase occurs when the predicted noise levels with the project exceed existing noise levels by 12 dBA, Leq(h). Once a noise impact is identified, mitigation measures must be investigated and considered for inclusion in the project.

Local Standards

The NPS *Director's Order 47, Soundscape Preservation and Noise Management*, requires all park facilities to be managed to minimize noise pollution. The *Director's Order 47* consequently states:

“Where natural soundscape conditions are currently not impacted by inappropriate noise sources, the objective must be to maintain those conditions. Where the soundscape is found to be degraded, the objective is to facilitate and promote progress toward the restoration of the natural soundscape.”

As noted in the *Final Environmental Impact Statement (FEIS)* for the *Presidio Trust Management Plan*, the FHWA criteria apply to the Trust lands. The FEIS also identifies areas of the Presidio that warrant special consideration as noise sensitive areas.

Methodology

In consultation with staff from the NPS, the Trust, and Caltrans, locations were identified within the Presidio to measure existing noise levels. These locations are known as receptor points. Receptor points represent buildings that are or might be considered noise-sensitive because of their current or future land use. They also represent areas that may be affected by high volumes of traffic or high levels of construction noise.

For this study, receptors are generally near consistent traffic flows, within view of Doyle Drive, or feature relatively uniform terrain. Receptor points also include areas that are a substantial distance from Doyle Drive and some receptors were used to establish ambient or background noise levels. A detailed discussion of methodology is provided in the section that follows.

Affected Environment

Locations within the project study area that are considered to be particularly sensitive to noise and vibration, as identified by the Trust and NPS, are:

- Crissy Field and Marsh;
- Crissy Field Center;
- Stilwell Hall;
- San Francisco National Cemetery; and
- Cavalry Stables.

Residential areas within the project study area considered particularly sensitive to noise and vibration are:

- Armistead Road (northwest of the junction of Highway 1 and Doyle Drive);
- Storey Avenue (north of Ruckman Avenue);
- Riley Avenue;
- Girard Road;
- Baker Street from Marina Boulevard to Richardson Avenue;
- the south side of Marina Boulevard from Baker Street to Broderick Street;
- the east side of Lyon Street north of Francisco Street; and
- Richardson Avenue from Doyle Drive to Francisco Street.

Another noise sensitive receptor within the project area that may be affected by the Doyle Drive Project is the Palace of Fine Arts.

Noise and vibration impacts on wildlife are discussed in the Natural Environment Section of this document.

General Noise Impacts

This section discusses how each project alternative would affect noise conditions in the study area. Noise levels measured in 2002 and 2004 at specific receptor points establish the baseline data of existing conditions. Traffic noise levels for the existing year and the year 2030 for all alternatives were then predicted using the traffic conditions that would be expected to create the worst case noise conditions.

Existing Noise Environment and Field Measurements

Vehicle traffic is the principal source of most existing noise within and surrounding the project area along Doyle Drive/Highway 101, Richardson Avenue, Lincoln Boulevard, Mason Street, and Gorgas Avenue. Deliveries to the Post Commissary and air handling equipment common to most buildings are also noise sources affecting the study area.

In 2002, long-term 24-hour noise measurements were taken at 11 locations: receptors A through K.²⁷ **Exhibit 3-59** presents the worst-hour noise level for each of these receptors.

In 2004, short-term, ten-minute measurements were taken at 20 locations over a period of five days between June 28 and July 2 to establish the general background level of noise within the study area. **Exhibit 3-60** (on the following pages) summarizes the average measured noise level at selected locations that have been identified as noise-sensitive areas. At some locations, like the Crissy Field Marsh Recreational Area and along Baker Street, the reasons for the higher than anticipated noise levels are not readily apparent. In both cases, high winds

²⁷ Long-term measurements were not taken at the Letterman site because of demolition activities.

Exhibit 3-59
Long-Term Noise Measurements

RECEPTOR	LOCATION	NUMBER OF Units	DISTANCE FROM NOISE SOURCE (IN METERS)	TRAFFIC NOISE ABATEMENT CATEGORY AND CRITERION	EXISTING WORST HOUR NOISE LEVEL dBA
A	3234 Lyon Street	8	15 meters from Richardson Ave. centerline	(B/E) 66	76
B	Marina Blvd. at Lyon	9	13 meters from Marina Blvd. centerline	(B/E) 66	74
C	Building 1029	40	130 meters from Doyle Drive centerline	(B/E) 66	62
D	Main Post Bldg. 106/211	n/a	15 meters from Doyle Drive centerline	(C) 71	70
E	Crissy Field/Commissary	n/a	130 meters from Doyle Drive centerline	(B) 66	63
F	Crissy Field/Stilwell Hall	n/a	50 meters from Doyle Drive centerline	(B) 66	64
G	Crissy Field/USCG	n/a	320 meters from Doyle Drive centerline	(B) 66	63
H	1251 Armistead Road	12	50 meters from Doyle Drive centerline	(B) 66	67
I	1291 Storey Ave.	16	50 meters from Doyle Drive centerline	(B) 66	61
J	National Cemetery/ Lincoln Blvd.	n/a	50 meters from Doyle Drive centerline	(B) 66	63
K	National Cemetery - Southend	n/a	460 meters from Doyle Drive centerline	(B) 66	57

and human activity are responsible for the high levels. For details on the noise receptor location and the results of the field measurements see pages 5-3 through 5-13 of the *Final Noise and Vibration Study*, December 2004. **Exhibits 3-61** through **3-63** on the following pages show the location of the receptors.

Modeled Data

When available, traffic data for the noise measurement period was input into the TNM to compare modeled measurements with the field measurements. Eleven long-term-measured receptor locations were modeled. Differences between the measured noise levels and the modeled noise levels for each receptor point were within 3 dBA. The only exception was the United States Coast Guard (USCG) facility at Crissy Field, whose results differed by 6 dBA. Local sound sources other than traffic most likely account for this difference.

The model was also used for the short-term field measurement receptors to establish existing traffic noise levels. The results at receptors 1, 10, 14, 17, 18, 19, 20, 21 were used to fine-tune the prediction model for the No-Build and Replace and Widen Alternatives. As noted above, details on each field

measurement site can be found in the *Final Noise and Vibration Study*. Where unusually high field measurements were identified, the cause is typically found to be one of two reasons:

- 1) the receptor location was in close proximity to the travel lane of a roadway;
or
- 2) large amounts of human or atmospheric interference (talking, laughter, high winds, etc.) during the measurement period were identified as typical of the conditions found at that receptor location.

Exhibit 3-60
Short-Term Noise Measurements for Selected Areas

SITE	LOCATION OR ADDRESS	CURRENT LAND USE	APPROXIMATE DISTANCE FROM NOISE SOURCE (IN METERS)	TRAFFIC NOISE ABATEMENT CATEGORY AND CRITERION	AVERAGE MEASURED NOISE LEVEL dBA
1	3234 Lyon Street	Residential, 8 residences	3 meters from edge of Richardson Ave.	(B/E) 66	77
6	Building 650/Stilwell Hall	Lodging	14 meter from Doyle Drive centerline	(B) 66	70
7	Crissy Field Marsh Recreation Area	Open Space	144 meters from Mason St. centerline	(B) 66	80
8	1253 Armistead Road	Residential, 12 residences	48 meters from Doyle Drive centerline	(B) 66	66
9	1291 Storey Avenue	Residential, 16 residences	50 meters from Doyle Drive centerline	(B) 66	66
10	National Cemetery at Lincoln Boulevard	Cemetery	37 meters from Doyle Drive centerline	(B) 66	69
12	Palace of Fine Art/Baker Street Area	Residential, 30 residences	14 meters from Baker St. centerline	(B) 66	82
16	Building 503 Crissy Field Center	Educational	11 meters from Mason St. centerline	(B) 66	72
19	Building 661/Cavalry Stable Pen	Commercial	99 meters from Doyle Drive centerline	C (71)	64
20	Log Cabin Picnic Area	Recreational	107 meters from Doyle Drive centerline	(B) 66	63
21	Battery Baldwin Area	Recreational	39 meters from Doyle Drive centerline	(B) 66	71

**Exhibit 3-81
Long-term Monitoring Locations, 2002**



A) Noise Monitoring and Assessment Locations

Exhibit 3-62
Short-term Noise Measurement Locations, 2004



9 Noise Measurement Locations

Exhibit 3-63
Noise Receptor Predictor Locations



9. Noise Receptor Prediction Locations

Temporary Impacts

The following section discusses the temporary noise impacts resulting from construction activities. These impacts are based on current knowledge of the anticipated construction process and may vary based on actual construction plans. In an attempt to identify potential construction impacts, both daytime and nighttime construction operations were considered. The *San Francisco Noise Ordinance* (which actually does not apply within the Presidio) was used as a guide to identify when and where potential construction noise impacts might occur throughout the project area. The results of the assessment are shown below.

Alternative 1: No-Build

Alternative 1 would not cause temporary impacts because no construction would occur.

Alternative 2: Replace and Widen

Temporary impacts resulting from Alternative 2 are generally the same as those for Alternative 5. Impacts specific to each construction option (With Detour and No-Detour) are discussed below.

Alternative 5: Presidio Parkway

Temporary impacts resulting from Alternative 5 are generally the same as those for Alternative 2. Impacts are discussed below.

Alternative 2: Replace and Widen and

Alternative 5: Presidio Parkway

Occurring over a construction period of multiple years, construction noise would be intermittent, and the level would vary depending on the type, location, and length of the activity. **Exhibit 3-64** shows the typical noise levels of construction equipment.

Generally, noise would range from the mid- to upper-80s dBA at receptors within 30 meters (100 feet) of the project construction limits. Construction equipment would generally operate in a limited area then move along the alignment until the completion of the project.

Temporary noise would affect the following sensitive areas:

Exhibit 3-64
Typical Noise Levels of
Construction Equipment

CONSTRUCTION EQUIPMENT	NOISE LEVEL (dBA at 15 meters [49 feet])
Dump Truck	88
Portable Air Compressor	81
Scraper	85
Concrete Mixer (Truck)	89
Jack Hammer	88
Dozer	85
Paver	89
Generator	81
Pile Driver	101
Backhoe	80

- **Residential areas throughout the project limits.** These areas could be exposed to noise levels above 89 dBA during construction.
- **Crissy Field Marsh.** Because of the distance of this area from most of the construction activities, construction noise impacts are expected to be minimal, if any.
- **Crissy Field Center.** With the possible exception of pile driving construction, noise levels would be in the range of 85 to 90 dBA within 15 meters (50 feet) of the corridor. The detour option would likely have the greatest construction noise impacts on the Crissy Field Center due to the actual construction of the detour, which would be placed in close proximity to the Center. The impacts resulting from these activities would generally be confined to Stage 1 construction and would be minimal beyond that point in the construction process until Stage 4, when the detour would be removed. An additional impact would be the staging of construction equipment in close proximity to the Center while the No-Detour option would have the staging area located further away.

Preferred Alternative: Refined Presidio Parkway

Exhibit 3-65 illustrates the predicted noise levels for 2030 traffic for the Temporary Construction Detour (TCD; the construction plan for the Preferred Alternative) and compares the results with those associated with the No-Build Alternative.

A review of the results shown in **Exhibit 3-65** on the following page reveals that of the 38 receptor sites reanalyzed, the noise levels of the TCD when compared to the No-Build Alternative are expected to decrease or remain the same at 23 sites and increase at 14 sites. The future noise levels are expected to approach or exceed the Noise Abatement Criteria (NAC) at sites 1, 6, 7, 10, 43, 47, 49, 50, 70, 71, 72, 73, and 76. Of the 14 sites with an increase, two of these sites are classified as Category B land uses (residential, recreational, etc.), while the remaining 12 are identified as commercial, office and mixed use sites under Category C. Of the 38 sites found in **Exhibit 3-65**, 15 already approach or exceed the NAC. The average increase in the traffic noise level as a result of the TCD is predicted to be about 3.5 dBA over the existing noise levels, a change which is barely detectable to the human ear in an exterior setting. This indicates that the TCD will create higher noise levels at some sites than the existing condition while it will be lower than the existing noise level at most of the sites that were analyzed.

Exhibit 3-65
Predicted Traffic Noise Levels During the Temporary Construction Detour (TCD) Phase

Receptor ¹	Site Description	Assumed Future Land Use ²	NAC Approach ³	Existing Condition	Preferred Alternative TCD Phase 2010	Change between Existing Condition and Preferred Alt TCD Phase
1	Palace of Fine Arts	Educational	66	71*	77*	6
2	Palace of Fine Arts	Educational	66	70*	60	-10
4	Mason St. Warehouse Building 1182	Office	71	68	60	-8
5	Mason St. Warehouse Building 1183/1186	Office	71	68	65	-3
6	Mason St. Warehouse Building 1184/1185	Office	71	69	75*	6
7	Building 603/ Crissy Interpretive Center	Educational	66	68*	74*	6
9	Building 610 / Post Commissary	Museum	71	69	70	1
10	Battery Blaney	Historic	66	75*	69*	-6
43	National Cemetery	Cemetery	66	72*	67*	-5
44	Building 129/Enlisted Family Quarters	Residential	66	65	61	-4
45	Building 122/Gym	Mixed Use	71	74*	65	-9
46	Building 108/Storage	Undetermined/ Commercial	71	74*	65	-9
47	Building 107/Switching Station	Undetermined/ Commercial	71	76*	72*	-4
48	Building 104/Mess Hall	Office	71	70	62	-8
49	Building 105/Mess Hall	Office	71	76*	76*	0
50	Building 106/Offices	Office	71	80*	74*	-6
51	Building 211/Former Burger King	Restaurant	71	75*	69	-6
52	Building 204/Exchange Store	Office	71	68	70	2
53	Building 210/Guard House	Bank and Post Office	71	71*	63	-8
55	Building 220/Bakers and Cooks School	Office	71	64	59	-5

Exhibit 3-65 (Continued)
 Predicted Traffic Noise Levels During the Temporary Construction Detour (TCD) Phase

Receptor ¹	Site Description	Assumed Future Land Use ²	NAC Approach ³	Existing Condition	Preferred Alternative TCD Phase 2010	Change between Existing Condition and Preferred Alt TCD Phase
56	Building 231/Exchange Gas Station	Undetermined / Commercial	71	65	67	2
57	Building 228/Bakery	Retail	71	65	63	-2
58	Building 227/Warehouse	Retail	71	64	61	-3
59	Building 223/Warehouse	Office	71	60	60	0
61	Building 1029/Swords to Plowshares	Residential	66	63	60	-3
62	Building 1030/Swords to Plowshares	Residential	66	63	57	-6
63	Building 1063/Medical Warehouse	Water Recycling Facility	71	61	60	-1
64	Building 1062/Quartermaster Shop	Undetermined / Commercial	71	59	58	-1
66	Building 1167/Gorgas Avenue Warehouse	Office	71	65	66	1
67	Building 1163/Gorgas Avenue Warehouse	Office	71	64	63	-1
68	Building 1169/Gorgas Avenue Warehouse	Office	71	66	68	2
69	Building 1162/Gorgas Avenue Warehouse	Office	71	62	66	4
70	Building 1170/Gorgas Avenue Warehouse	Office	71	70	75*	5

Exhibit 3-65 (Continued)
Predicted Traffic Noise Levels During the Temporary Construction Detour (TCD) Phase

Receptor ¹	Site Description	Assumed Future Land Use ²	NAC Approach ³	Existing Condition	Preferred Alternative TCD Phase 2010	Change between Existing Condition and Preferred Alt TCD Phase
71	Building 1161/Gorgas Avenue Warehouse	Office	71	66	72*	6
72	Building 1160/Gorgas Avenue Warehouse	Office	71	72*	75*	3
73	Building 1152/Presidio YMCA Gym	Office	71	71*	73*	2
75	Building 1004/Officers Quarters	Office	71	55	58	3
76	3234 Lyon St.	Residential	66	75*	75*	0
Number of sites approaching or exceeding the NAC				15	13	

- Notes: ¹For details regarding the receptor location, see Appendix E of the 2004 NVS.
²Based on Presidio Trust Management Plan and consultation with Presidio Trust and NPS staff. In cases where future land use was undetermined, the existing land use was assumed for land use.
³FHWA noise abatement criterion approach based on existing or anticipated land use. Approach is defined by Caltrans as being within one 1dBA of the noise abatement criterion.
***Bolded** numbers indicate noise levels that approach, equal, or exceed the NAC.

The TCD, as shown in **Exhibit 3-65**, has the potential to increase the noise levels at 28 sites when compared to the predicted noise levels for the existing condition. This increase is expected to range from 1 to 6 dBA. The increase in the expected traffic noise level associated with the TCD is primarily attributable to the general shift to the north and to the placement of the roadway in an at-grade condition in areas where it was previously anticipated to be elevated.

The greatest increase in noise level is expected to be at the Crissy Field Center, Buildings 1184 and 1185 and 1186 (Mason Street warehouses), Buildings 1161 and 1170, and the Palace of Fine Arts. While all buildings and public use areas within the Doyle Drive corridor that could be impacted by traffic noise from the TCD were evaluated, specific concerns related to the impacts on the Crissy Field Center were reviewed in detail. The Crissy Field Center is a community environmental facility that offers a wide variety of programs such as workshops and special events. The Center also houses a media lab, arts workshop, urban ecology lab, and resource library and is used for many educational functions such

as summer programs. Concerns about the continued operation of the Center during and following construction have been raised.

Based on the results of the traffic noise modeling effort completed as part of this study, no basic increase in traffic noise is expected over the No-Build scenario with either the Presidio Parkway Alternative or the Preferred Alternative. The greatest concern related to traffic noise impacts is associated with the TCD and the construction process itself. While the construction impacts have been noted in detail in the 2004 *Final Noise and Vibration Study*, the impacts associated with the TCD are noticeably greater (5 dBA or more increase) at five locations.

Consistent with 23 CFR 772, noise abatement must be considered for Type I projects when the predicted noise level approaches or exceeds the NAC or when the project results in a substantial noise increase (defined by Caltrans as an increase of 12 dBA or more). A number of locations were identified where traffic noise exposure currently is anticipated to approach, equal, or exceed the NAC within the realigned segment of the Preferred Alternative. Since abatement for this area was considered in the 2004 *Final Noise and Vibration Study*, further consideration of abatement is not warranted since the overall composition of this alternative has not changed.

Consistent with Caltrans protocol and FHWA requirements, noise abatement is only considered where noise impacts are predicted, and where frequent human use occurs and a lowered noise level would be of benefit. This approach gives primary consideration to exterior areas. If there are no exterior activities that are affected by traffic noise, then the interior criterion shown in Category E of the FHWA regulations would be used as the basis for determining whether noise abatement is reasonable and feasible.

Permanent Impacts

The 76 receptor points selected to predict future noise levels represent various land uses and distances to Doyle Drive. For each alternative, the morning peak level condition and the afternoon peak level condition was evaluated. Existing noise levels were analyzed, and noise levels were predicted for the year 2030 using the traffic conditions that would be expected to create the worst case noise condition. Changes in anticipated traffic noise levels at the 31 impacted receptor points are shown in **Exhibit 3-66**. At a number of receptors, the reason for the change is not readily apparent. In most cases the change is due to one of the following: an increase in traffic; a shift in the alignment that brings the traffic closer or further away from the receptor; or a change in the profile (elevation) of the roadway. For details on each receptor and an explanation for the change (if any), refer to pages 6-3 through 6-17 of the 2004 *Final Noise and Vibration Study*.

**Exhibit 3-66
Predicted Traffic Noise Levels**

RECEPTOR ¹	SITE DESCRIPTION	ASSUMED FUTURE LAND USE ²	NAC APPROACH ³	EXISTING	NO-BUILD 2030	REPLACE & WIDEN 2030	ALTERNATIVES			PREFERRED ALTERNATIVE 2030
							PRESIDIO DIAMOND 2030	PRESIDIO PARKWAY CIRCLE 2030	PRESIDIO PARKWAY DIAMOND 2030	
1	Palace of Fine Arts	Educational	65	71*	72*	71*	70*	69*	70*	
2	Palace of Fine Arts	Educational	65	70*	71*	67*	62	62	62	
3	Mason St. Warehouse Building 1187/1188	Office	71	68	69	67	57	58	57	
4	Mason St. Warehouse Building 1182	Office	71	68	69	64	55	56	55	
5	Mason St. Warehouse Building 1183/1185	Office	71	68	68	65	57	57	57	
6	Mason St. Warehouse Building 1184/1185	Office	71	69	70	66	60	59	60	
7	Building 603/Chase Interpretative Center	Educational	65	68*	67*	69*	55	57	54	
8	PX Building	Undetermined/Commercial	71	70	70	67	60	60	60	
9	Building 610/ Post Commissary	Museum	71	69	69	66	71*	71*	68	
10	Battery Boney	Historic	65	75*	75*	71*	70*	70*	72*	
11	Battery Shaucliter	Historic	65	79*	80*	81*	66*	66*	63	
12	Battery Sherwood	Historic	65	77*	77*	77*	66*	66*	66*	
13	Battery Baldwin	Historic	65	66*	67*	65	68*	68*	68*	
14	Building 644/ Unit/Motor Pool	Undetermined/Commercial	71	63	64	61	61	61	61	
15	Building 649/ Army Reserves	Lodging	65	60	61	61	61	61	61	
16	Building 650/ Stowell Hall	Lodging	65	61	60	60	59	60	59	
17	Leidum Court/ Officers Quarters	Residential	65	64	65	66*	65	65	65	
18	1253 Armistead Road	Residential	65	71*	72*	73*	77*	77*	77*	
19	Building 969/ Garage	Undetermined/Commercial	71	52	53	53	59	59	59	
20	Building 968/ Garage	Undetermined/Commercial	71	54	55	55	60	60	60	
21	Building 967/ Film Vault	Undetermined/Commercial	71	56	57	57	65	65	65	
22	Building 966/ Radio Receiver Station	Undetermined/Commercial	71	56	57	57	65	65	63	
23	Building 964/ Officer Family Housing	Residential	65	53	54	55	64	64	64	
24	Building 963/ Officer Family Housing	Residential	65	54	55	55	63	63	63	
25	Building 962/ Officer Family Housing	Residential	65	54	55	55	62	62	62	
26	Building 1659/ Data Center	Undetermined/Commercial	71	69	70	70	75*	75*	75*	
27	Log Cabin Picnic Area	Recreational	65	69*	69*	69*	69*	69*	69	
28	Ft. Scott Chapel	Religious	65	61	63	62	65	65	65	
29	1258 Storey Ave./ Enlisted Family Housing	Residential	65	67*	68*	68*	67*	67*	67*	
30	1257 Storey Ave./ Enlisted Family Housing	Residential	65	68*	70*	69*	69*	69*	69*	

South Access to the Golden Gate Bridge - Doyle Drive FEIS/R
Chapter Three: Affected Environment, Environmental Consequences, and Avoidance,
Minimization and Mitigation Measures

**Exhibit 3-66 (Continued)
Predicted Traffic Noise Levels**

RECEPTOR ¹	SITE DESCRIPTION	ASSUMED FUTURE LAND USE ²	NAC APPROACH ³	EXISTING	ALTERNATIVES				
					NO-BUILD 2030	REPLACE & WIDEN 2030	PRESIDIO PARKWAY DIAMOND 2030	PRESIDIO PARKWAY CIRCLE 2030	PREFERRED ALTERNATIVE 2030
31	1255 Storey Ave./Enlisted Family Housing	Residential	63	70*	71*	71*	71*	71*	71*
32	1254 Storey Ave./Enlisted Family Housing	Residential	63	72*	73*	71*	71*	71*	71*
33	1253 Storey Ave./Enlisted Family Housing	Residential	63	73*	74*	72*	72*	72*	72*
34	1251 Storey Ave./Enlisted Family Housing	Residential	63	73*	74*	73*	73*	73*	73*
35	1250 Storey Ave./Enlisted Family Housing	Residential	63	73*	74*	74*	74*	74*	74*
36	1259 Storey Ave./Enlisted Family Housing	Residential	63	70*	71*	73*	73*	73*	73*
37	1263 Storey Ave./Enlisted Family Housing	Residential	63	66*	67*	69*	69*	69*	69*
38	Building 682/ Cross Cultural Center	Educational	63	63	64	65	65	65	65
39	Building 661/ Cavalry Stables	Park Police	71	66	67	60	60	60	60
40	Building 662/ Cavalry Stables	Cultural/Educational	63	66*	66*	63	63	63	63
41	Building 663/ Cavalry Stables	Cultural/Educational	63	65	65	63	63	63	63
42	Building 667/ Cavalry Stables	NPS Archives	71	66	67	67	67	67	67
43	National Cemetery Grave Site	Cemetery	63	72*	73*	64	65	65	57
44	Building 129/ Enlisted Family Quarters	Residential	63	65	70*	57	58	58	71*
45	Building 122/ Gym	Mixed Use	71	74*	75*	62	63	63	73*
46	Building 108/ Storage/Electrical Shop	Undetermined/Commercial	71	74*	74*	63	63	63	73*
47	Building 107/ Switching Station	Undetermined/Commercial	71	76*	75*	68	68	68	74*
48	Building 104/ Barracks and Mess Hall	Office	71	70	70	59	59	59	71*
49	Building 105/ Barracks and Mess Hall	Office	71	76*	74*	74*	74*	74*	77*
50	Building 106/ Band Barracks	Office	71	80*	75*	73*	73*	73*	78*
51	Building 211/ former Burger King	Restaurant	71	75*	74*	63	66	66	63
52	Building 204/ Exchange Store	Office	71	68	67	Gone ⁴	Gone ⁴	Gone ⁴	Gone ⁴
53	Building 210/ Guard House	Bank and Post Office	71	71*	71*	63	63	63	63
54	Building 201/ Exchange Store	Office and Retail	71	65	64	Gone ⁴	Gone ⁴	Gone ⁴	Gone ⁴
55	Building 220/ Bakers and Cooks School	Office	71	64	65	54	54	54	54
56	Building 231/ Exchange Gas Station	Undetermined/Commercial	71	68	68	63	66	66	63
57	Building 228/ Bakery	Retail	71	65	65	62	62	62	62
58	Building 237/ Warehouse	Retail	71	64	64	59	59	59	59
59	Building 233/ Warehouse	Office	71	60	61	57	58	58	57
60	Building 230/ Warehouse	Retail or other use	71	67	67	Gone ⁴	Gone ⁴	Gone ⁴	Gone ⁴

**Exhibit 3-66 (Continued)
Predicted Traffic Noise Levels**

RECEPTOR ¹	SITE DESCRIPTION	ASSUMED FUTURE LAND USE ²	NAC APPROACH ³	EXISTING	ALTERNATIVES					PREFERRED ALTERNATIVE 2030
					NO-BUILD 2030	REPLACE & WIDEN 2030	PRESIDIO PARKWAY DIAMOND 2030	PRESIDIO PARKWAY CIRCLE 2030	PRESIDIO PARKWAY ALTERNATIVE 2030	
61	Building 1025/ Swords to Plowshares	Residential	65	63	64	63	60	60	60	62
62	Building 1030/ Swords to Plowshares	Residential	65	61	62	61	58	58	58	58
63	Building 1063/ Medical Supply Warehouse	Water Recycling Facility	71	61	62	62	63	63	63	63
64	Building 1062/ Quartermaster Shop	Undetermined/Commercial	71	59	60	60	60	60	60	62
65	Building 1060/ Medical Supply Warehouse	Undetermined/Commercial	71	58	59	60	60	60	60	62
66	Building 1167/ Gorgas Warehouse	Office	71	65	66	66	65	66	66	65
67	Building 1168/ Gorgas Warehouse	Office	71	64	65	65	65	66	66	65
68	Building 1169/ Gorgas Warehouse	Office	71	68	67	68	65	64	64	65
69	Building 1162/ Gorgas Warehouse	Office	71	62	63	63	63	63	63	63
70	Building 1170/ Gorgas Warehouse	Office	71	70	70	72*	72*	72*	72*	72*
71	Building 1161/ Gorgas Warehouse	Office	71	68	68	67	67	67	67	67
72	Building 1160/ Gorgas Warehouse	Office	71	72*	71*	71*	72*	72*	72*	72*
73	Building 1152/ Presidio YMCA Gym	Office	65	71*	71*	71*	72*	70*	70*	72*
74	Building 1151/ Presidio YMCA Pool	Recreational Pool	65	74*	73*	73*	73*	Gone ⁴	Gone ⁴	73*
75	Building 1004/ Officers Quarters	Office	71	55	56	57	57	57	57	57
76	3234 Lyon Street	Residential	65	75*	76*	76*	75*	73*	73*	75*
	Number of sites approaching or exceeding the NAC			31	31	25	25	24	24	25

Source: ESA 2004

Notes: ¹For details regarding the receptor location, see Appendix H of the Final Noise and Vibration Study, December 2004.

²Based on the Presidio Trust Management Plan and consultation with Presidio Trust and NPS staff. In cases where future land use was undetermined, the existing land use was assumed for future use.

³FHWA noise abatement criterion approach based on anticipated land use, as defined in Footnote 2 above. Approach is defined by Caltrans as being within 1 dBA of the noise abatement criterion.

⁴Indicates that this building is anticipated to be removed as part of the construction project.

Bolded numbers indicate a noise level that approaches, equals, or exceeds the NAC.

Alternative 1: No-Build

The No-Build Alternative would not create any permanent noise impacts. Currently, the noise level at 31 of the 76 receptors modeled for traffic noise impacts approach, equal, or exceed the NAC for the receptors' land use. Noise at all 31 of these receptors is expected to approach, equal or exceed the NAC in 2030. This increase would likely range from 1 dBA to 2 dBA, an increase that is not perceptible.

The No-Build Alternative's effects on the sensitive land uses described in the affected environment section of this document would be as follows:

- **Crissy Field Center and Crissy Field** (receptor 7) - No perceptible increase in noise is expected. The predicted existing exterior noise level at this receptor is 68 dBA. The future No-Build traffic noise levels are expected to be slightly lower (67 dBA) as a result of slower traffic speeds – a direct result of increased congestion.
- **Cavalry Stables** (receptor 39 to 42) - No perceptible noise impacts would occur. Noise levels are expected to increase no more than 1 dBA over the existing noise level.
- **Stilwell Hall** (receptor 16) - No noise impacts would occur. Existing noise levels are predicted to be 61 dBA and the No-Build Alternative is not predicted to approach the NAC for this land use.
- **National Cemetery** (receptor 43) - Both existing and future No-Build noise levels are predicted to remain at the existing 72 dBA level, which exceeds the NAC by 5 dBA.

Alternative 2: Replace and Widen

While the final configuration of both options within the Replace and Widen Alternative are nearly the same, resulting in similar noise impacts, the No-Detour option results are presented in the following information. For the No-Build condition, noise levels at 31 of the 76 receptors approach, equal, or exceed the NAC. Under Alternative 2, the number of receptors where noise levels approach, equal, or exceed the NAC increases to 34.

Noise at the following four receptors would remain the same or decrease by 3 to 7 dBA, a perceptible decrease:

- **Palace of Fine Arts** (receptor 1) – the noise level would match the existing noise level of 71 dBA.
- **Battery Blaney** (receptor 10) - noise levels would decrease from 75 dBA to 71 dBA.
- **Building 106** (receptor 50) - noise levels would continue to exceed the NAC, but depending on the option, possibly would decrease from 80 dBA to 75 dBA.
- **Building 1152** (receptor 73) - noise would exceed the NAC by 5 dBA, decreasing from 71 dBA to 68 dBA.

Noise at Building 129 (receptor 44), a residence that is currently below the NAC, would increase by 5 dBA, a perceptible increase, from 65 dBA to 70 dBA. Noise at the remaining areas would mainly increase by 1 dBA to 2 dBA, an imperceptible increase.

Exhibit 3-67 on the following page summarizes the data for the 34 receptors. The following summarizes how Alternative 2 would affect the sensitive receptors within the project area:

- **Crissy Field and the Crissy Field Center** (receptor 7) - No perceptible noise impacts would occur. The exterior noise level at this receptor is currently high, 68 dBA.
- **Cavalry Stables** (receptors 40 and 41) - No perceptible noise impacts would occur. Noise levels are not expected to increase noticeably above the current 65 to 66 dBA level.
- **Stilwell Hall** (receptor 16) - No noise impacts would occur. Noise levels are currently predicted to be 61 dBA and the future noise level would not approach the NAC for this land use.
- **National Cemetery** (receptor 43) - Noise impacts would occur; noise levels are predicted to increase 1 dBA to 73 dBA, exceeding the NAC by 6 dBA. However, the net increase in noise level from existing conditions would be 1 dBA, an imperceptible increase.

Alternative 5: Presidio Parkway

Alternative 5 has two options for creating direct access to the Presidio and Marina Boulevard at the eastern end of the project: the Diamond Option and the Circle Drive Option. With either option, noise levels at 24 of the receptors is predicted to approach, equal, or exceed the NAC in 2030. Noise at 22 of these receptors currently approaches, equals, or exceeds the NAC.

Noise levels at the 1253 Armistead Road house (receptor 18) would be 77 dBA, a perceptible increase of 6 dBA over existing levels. Noise at the 1289 and 1263 Storey Avenue houses (receptors 36 and 37) would be 73 dBA and 69 dBA, respectively, an increase of 3 dBA at each address.

At the historic Batteries Blaney, Sherwood, and Slaughter, noise would decrease. At Battery Slaughter (receptor 11) noise levels would decrease substantially to 66 dBA, a 13 dBA decrease from existing levels. At Battery Sherwood (receptor 12), noise would decrease to 66 dBA, an 11 dBA decrease. At Battery Blaney (receptor 10), noise would decrease by 5 dBA, from 75 dBA to 70 dBA, but would still be 3 dBA above the NAC.

Exhibit 3-67

Alternative 2 — Predicted Traffic Noise Levels Receptors that will Approach, Equal, or Exceed NAC

RECEPTOR ¹	SITE DESCRIPTION	ASSUMED FUTURE LAND USE ²	NAC APPROACH ³	EXISTING	REPLACE & WIDEN 2030	dBA CHANGE
1	Palace of Fine Arts	Educational	66	71	71	0
2	Palace of Fine Arts	Educational	66	70	67	-3
7	Building 603/Crissy Interpretative Center	Educational	66	68	69	+1
10	Battery Blaney	Historic	66	75	71	-4
11	Battery Slaughter	Historic	66	79	81	+2
12	Battery Sherwood	Historic	66	77	77	0
17	Lendrum Court/ Officers Quarters	Residential	66	64	66	+2
18	1253 Armistead Road	Residential	66	71	73	+2
27	Log Cabin Picnic Area	Recreational	66	69	69	0
29	1298 Storey Ave./ Enlisted Family Housing	Residential	66	67	68	+1
30	1297 Storey Ave./Enlisted Family Housing	Residential	66	68	69	+1
31	1295 Storey Ave./Enlisted Family Housing	Residential	66	70	71	+1
32	1294 Storey Ave./Enlisted Family Housing	Residential	66	72	73	+1
33	1293 Storey Ave./Enlisted Family Housing	Residential	66	73	75	+2
34	1291 Storey Ave./Enlisted Family Housing	Residential	66	73	75	+2
35	1290 Storey Ave./Enlisted Family Housing	Residential	66	73	75	+2
36	1289 Storey Ave./Enlisted Family Housing	Residential	66	70	72	+2
37	1263 Storey Ave./Enlisted Family Housing	Residential	66	66	68	+2
40	Building 662/Cavalry Stables	Cultural/Educational	66	66	67	+1
41	Building 663/Cavalry Stables	Cultural/Educational	66	65	66	+1
43	National Cemetery Grave Site	Cemetery	66	72	73	+1
44	Building 129/ Enlisted Family Quarters	Residential	66	65	70	+5
45	Building 122/ Gym	Mixed Use	71	74	74	0
46	Building 108/ Storage/Electrical Shop	Undetermined/ Commercial	71	74	74	0
47	Building 107/ Switching Station	Undetermined/ Commercial	71	76	75	-1
49	Building 105/ Barracks and Mess Hall	Office	71	76	74	-2
50	Building 106/ Band Barracks	Office	71	80	75	-5
51	Building 211/ former Burger King	Restaurant	71	75	74	-1
53	Building 210/ Guard House	Bank and Post	71	71	71	0
70	Building 1170/ Gorgas Warehouse	Office	71	70	71	+1
72	Building 1160/ Gorgas Warehouse	Office	71	72	72	0
73	Building 1152/ Presidio YMCA Gym	Office	66	71	68	-3
74	Building 1151/ Presidio YMCA Pool	Recreational/Pool	66	74	75	+1
76	3234 Lyon Street	Residential	66	75	76	+1

Notes: ¹For details regarding the receptor location, see Appendix H of the Final Noise and Vibration Study, December 2004.

²Based on the Presidio Trust Management Plan and consultation with Presidio Trust and NPS staff. In cases where future land use was undetermined, the existing land use was assumed for future use.

³FHWA noise abatement criterion approach based on anticipated land use, as defined in Footnote 2 above. Approach is defined by Caltrans as being within 1 dBA of the noise abatement criterion.

Noise at Building 1659 (receptor 26) would increase by 6 dBA, from 69 dBA to 75 dBA, exceeding the NAC. Conversely, noise at Building 106 (receptor 50), currently used as office space, would decrease by 7 dBA, from 80 dBA to 73 dBA, bringing the level to 1 dBA above the NAC. At the remaining receptor, noise levels would either not change, increase by 1 dBA to 2 dBA, or decrease by 1 dBA to 2 dBA, changes that are not perceptible.

The Diamond Option

If the Diamond Option is built, noise at Building 1151, the Presidio YMCA pool, would decrease by 1 dBA, an imperceptible change. **Exhibit 3-68** on the following page summarizes data for receptor points affected by Alternative 5 with the Diamond Option.

The Circle Drive Option

The Circle Drive Option would yield a 1 dBA decrease in noise levels in the vicinity of the Palace of Fine Arts (receptor 1), and at Building 1152 – Presidio Gym (receptor 73) and a 2 dBA decrease at 3234 Lyon Street (receptor 76). In the Gorgas vicinity Buildings 1163 and 1167 (receptors 66 and 67) there would be a 1 to 2 dBA increase in noise.

The following summarizes the noise effects of the Presidio Parkway Alternative with either the Diamond Option or Circle Drive Option on sensitive land uses within the project area:

- **Crissy Field** - No perceptible noise impacts would occur. No increase in noise is expected; traffic in much of this area would be in a tunnel.
- **Crissy Field Center** (receptor 7) - No perceptible noise impacts would occur. Because traffic would be in tunnels in this area, noise is predicted to decrease by 11 dBA to 12 dBA, reducing levels to well below the NAC.
- **Cavalry Stables** (receptors 39 to 42) - No noise impacts would occur. Levels are expected to range from 60 dBA to 67 dBA, equal to or below the NAC, depending on the interchange design that is built.
- **Stilwell Hall** (receptor 16) - No perceptible noise impacts would occur. Noise levels are expected to be 59 dBA to 60 dBA, well below the NAC.

Exhibit 3-68
Alternative 5 (Diamond Option) — Predicted Traffic Noise Levels Receptors that will Approach, Equal, or Exceed NAC

RECEPTOR ¹	SITE DESCRIPTION	ASSUMED FUTURE LAND USE ²	NAC APPROACH ³	EXISTING	PRESIDIO PARKWAY DIAMOND 2030	dba CHANGE
1	Palace of Fine Arts	Educational	66	71	70	-1
9	Building 610/ Post Commissary	Museum	71	69	71	+2
10	Battery Blaney	Historic	66	75	70	-5
11	Battery Slaughter	Historic	66	79	66	-13
12	Battery Sherwood	Historic	66	77	66	-11
13	Battery Baldwin	Historic	66	66	68	+2
18	1253 Armistead Road	Residential	66	71	77	+6
26	Building 1659/ Data Center	Undetermined/ Commercial	71	69	75	+6
27	Log Cabin Picnic Area	Recreational	66	69	69	0
29	1298 Storey Ave./Enlisted Family Housing	Residential	66	67	67	0
30	1297 Storey Ave./Enlisted Family Housing	Residential	66	68	69	+1
31	1295 Storey Ave./Enlisted Family Housing	Residential	66	70	71	+1
32	1294 Storey Ave./Enlisted Family Housing	Residential	66	72	71	-1
33	1293 Storey Ave./Enlisted Family Housing	Residential	66	73	72	-1
34	1291 Storey Ave./Enlisted Family Housing	Residential	66	73	73	0
35	1290 Storey Ave./Enlisted Family Housing	Residential	66	73	74	+1
36	1289 Storey Ave./Enlisted Family Housing	Residential	66	70	73	+3
37	1263 Storey Ave./Enlisted Family Housing	Residential	66	66	69	+3
49	Building 105/ Barracks and Mess Hall	Office	71	76	74	-2
50	Building 106/ Band Barracks	Office	71	80	73	-7
70	Building 1170/ Gorgas Warehouse	Office	71	70	72	+2
72	Building 1160/ Gorgas Warehouse	Office	71	72	72	0
73	Building 1152/ Presidio YMCA Gym	Office	66	71	72	+1
74	Building 1151/ Presidio YMCA Gym	Recreational/ Pool	66	74	73	-1
76	3234 Lyon Street	Residential	66	75	75	0

Notes: ¹For details regarding the receptor location, see Appendix H of the Final Noise and Vibration Study, December 2004.

²Based on the Presidio Trust Management Plan and consultation with Presidio Trust and NPS staff. In cases where future land use was undetermined, the existing land use was assumed for future use.

³FHWA noise abatement criterion approach based on anticipated land use, as defined in Footnote 2 above. Approach is defined by Caltrans as being within 1 dBA of the noise abatement criterion.

- **National Cemetery** (receptor 43) - No perceptible noise impacts would occur. Because traffic would travel through a cut section of the road or a tunnel bordering the cemetery, noise in this area would decrease from existing levels by 7 dBA to 8 dBA, reducing the levels to below the NAC.
- **Residential Areas at Armistead Road** (receptor 18), **Storey Avenue** (receptors 29-37), and **Lyon Street** (receptor 76) - The noise level is predicted to range from 67 dBA to 77 dBA. This represents a variation of -1 to +6 dBA, depending upon the residential area in question. The greatest increase would be in the Armistead Road area while the Storey Avenue residents would see a change from -1 to +3 dBA. Those along Lyon Street are not predicted to see any change.

Presidio Parkway Design Options

Noise effects were evaluated for the Presidio Parkway Alternative's two design options: the Merchant Road Slip Ramp Option and the Hook Ramp Option. The results of that evaluation are summarized in **Exhibit 3-68**. In each case, the noise level shown reflects the worst case result, whether it was the Slip Ramp or Hook Option. In some cases (for example, receptor 18) the results are the same.

Merchant Road Slip Ramp. The Merchant Road Slip Ramp would be a new connection from westbound Doyle Drive to Merchant Road. Traffic would be shifted northwards, closer to residences on Armistead Road, increasing the noise level at receptor 17 and receptors 19 to 25 by 2 dBA to 4 dBA above the levels anticipated for the Presidio Parkway Alternative without this option. However, because four buildings would be removed to construct the ramp, fewer buildings along Armistead Road would be affected by an increase in noise levels.

Hook Ramp. The Hook Ramp Option would rebuild the existing ramp connecting northbound Veterans Boulevard to eastbound Doyle Drive, improving the ramp entrances and exits. This option would not cause a change in existing noise levels. Although the ramp would be closer to the Cavalry Stables, it would be higher and would not extend as far to the east, lessening the effects of traffic noise on receptors in its vicinity. The traffic volumes are also projected to be lower with this option, which would also reduce the traffic noise level.

Tunnel Design Elements. Elements of the tunnel design of the Presidio Parkway Alternative may affect the noise environment in areas adjacent to the tunnels.

- **Exhaust Fans** — The Presidio Parkway Alternative may require operating exhaust fans in the tunnels, which could cause noise impacts to the area around the tunnels if typical tunnel exhaust portals are used. Ceiling-mounted fans that force air in either direction without the need for exhaust vents would be the likely choice for this alternative. This type of fan eliminates the need for exhaust portals and reduces noise effects.

Additionally, the location of the fans within the tunnels would ensure that fan noise would not affect the tunnel portal areas.

- Tunnel Portal Noise — Although the tunnels are predicted to reduce traffic noise in some areas, tunnel portal noise may affect receptors near the tunnel portals. Using the TNM model to establish tunnel portal noise levels was not feasible. However, research on tunnel noise shows that noise levels measured in front of tunnel portals is minor beyond 18 to 21 meters (60 to 70 feet). The research also shows that noise levels on top of a tunnel are minor beyond 9 to 12 meters (30 to 40 feet).

Given the location of the tunnels, few areas within the project corridor would be affected by tunnel portal noise. These areas are a small portion of the National Cemetery (receptor 43), Battery Blaney (receptor 10), Battery Sherwood (receptor 12), and Building 231/Service Station (receptor 56), totaling 692 square meters (7,449 square feet). Noise levels in these areas increase by 3 dBA because of the proximity of the portals of the tunnels. This additional noise was used in calculation of potential areas of impact at the portals and used to determine preliminarily reasonable and feasible abatement concepts. No other noise sensitive areas are within a 21-meter (70-foot) radius of the tunnel portals.

Preferred Alternative: Refined Presidio Parkway

Exhibit 3-69 illustrates the predicted noise levels for 2030 traffic for the Preferred Alternative and compares the results with those for the future No-Build Alternative. A review of the results shown in **Exhibit 3-69** reveals that of the 76 receptor sites reanalyzed, the noise levels of the Preferred Alternative when compared to the No-Build Alternative are expected to decrease or remain the same at 48 sites and increase at 25 sites, with three sites being removed for construction. The future noise levels are expected to approach or exceed the NAC at sites 1, 10, 12-13, 18, 26-27, 29-37, 44-50, 74, and 76. Of the 25 sites with an increase, 11 of these sites are classified as Category B land uses (residential, recreational, etc.), while the remaining 14 are identified as commercial, office or mixed use sites under Category C. Overall, the average noise level for the 76 sites is predicted to decrease 2.8 dBA from the levels predicted for the No-Build Alternative. .

The Preferred Alternative impacts would be location specific, concentrated in the residential areas along Storey Avenue, Armistead Road, Officer Family Housing, and Lyon Street. These receptors are near the roadways, often less than six meters (20 feet) away. As noted in **Exhibit 3-69**, the Preferred Alternative is expected to have a noticeable traffic noise level increase on Buildings 129, 962, 963, 964, 966, 967, 968, 969, 1659, and 1253 Armistead Road with a minor increase at Battery Baldwin, Building 644, Ft. Scott Chapel, 1289 Storey Avenue, 1263 Storey Avenue, Buildings 682, 104, 105, 1063, 1060, 1170, 1161, 1160, 1152, and 1104. At the same time, the Preferred Alternative is predicted to result in a noticeable decrease in traffic noise levels at Buildings 210, 211, 220, 227, 603 (Crissy Field Center), 1182-1188 (Mason Street warehouses), 605 (PX Building),

Battery Slaughter, Battery Sherwood, and the National Cemetery site. Minor decreases are predicted at Buildings 106, 107, 108, 122, 223, 228, 231, 610, 650, 662, 663, 1029, 1030, 1167, 1169, Battery Blaney, 1291 Storey Avenue, 1293 Storey Avenue, 1294 Storey Avenue, 1297 Storey Avenue, 1298 Storey Avenue and 3234 Lyon Street.

Most of these buildings are currently vacant or are designated for commercial use with no exterior areas of frequent human use where a lowered noise level would be of benefit. Therefore, additional consideration of noise abatement in the form of noise barrier walls beyond those considered in the 2004 *Final Noise and Vibration Study* was determined to be unwarranted. As noted in the 2004 *Final Noise and Vibration Study*, the use of soundproofing and quieter pavement surfaces would be explored in detail as part of the design phase of this project.

The following summarizes the noise effects of the Preferred Alternative on sensitive land uses within the project area:

- **Crissy Field** - No perceptible noise impacts would occur. No increase in noise is expected; traffic in much of this area would be in a tunnel.
- **Crissy Field Center** (receptor 7) - No perceptible noise impacts would occur. Because traffic would be in tunnels in this area, noise is predicted to decrease by 13 dBA from the No-Build condition, reducing levels to well below the NAC.
- **Cavalry Stables** (receptors 39 to 42) - No noise impacts would occur. Levels are expected to range from 60 dBA to 67 dBA, equal to or below the NAC, depending on the interchange design that is built.
- **Stilwell Hall** (receptor 16) - No perceptible noise impacts would occur. Noise levels are expected to be 59 dBA, well below the NAC.
- **National Cemetery** (receptor 43) - No perceptible noise impacts would occur. Because traffic would travel through a tunnel bordering the cemetery, noise in this area would decrease from existing levels by 15 dBA, reducing the levels to below the NAC.
- **Residential Areas at Armistead Road** (receptor 18), **Storey Avenue** (receptors 29-37), and **Lyon Street** (receptor 76) - The noise level is predicted to range from 67 dBA to 77 dBA. When compared to the No-Build condition, this represents a variation of -1 to +5 dBA, depending upon the residential area in question. The greatest increase would be in the Armistead Road area (up to a 5 dBA increase) while the Storey Avenue area would experience a variation -1 to +2 dBA. Those along Lyon Street are not predicted to see any change.

Tunnel Design Elements. Elements of the tunnel design of the Preferred Alternative may affect the noise environment in areas adjacent to the tunnels.

- **Exhaust Fans** — The Preferred Alternative may require operating exhaust fans in the tunnels, which could cause noise impacts to the area around the tunnels if typical tunnel exhaust portals are used. Ceiling-mounted fans that

force air in either direction without the need for exhaust vents would be the likely choice for this alternative. This type of fan eliminates the need for exhaust portals and reduces noise effects. Additionally, the location of the fans within the tunnels would ensure that fan noise would not affect the tunnel portal areas.

- Tunnel Portal Noise — Although the tunnels are predicted to reduce traffic noise in some areas, tunnel portal noise may affect receptors near the tunnel portals. Using the TNM model to establish tunnel portal noise levels was not feasible. However, research on tunnel noise shows that noise levels measured in front of tunnel portals is minor beyond 18 to 21 meters (60 to 70 feet). The research also shows that noise levels on top of a tunnel are minor beyond 9 to 12 meters (30 to 40 feet).

Given the location of the tunnels, few areas within the project corridor would be affected by tunnel portal noise. These areas are a small portion of the National Cemetery (receptor 43), Battery Blaney (receptor 10), Battery Sherwood (receptor 12), and Building 231/Service Station (receptor 56), totaling 692 square meters (7,449 square feet). Noise levels in these areas increase by 3 dBA because of the proximity of the portals of the tunnels. This additional noise was used in calculation of potential areas of impact at the portals and used to determine preliminarily reasonable and feasible abatement concepts. No other noise sensitive areas are within a 21-meter (70-foot) radius of the tunnel portals.

**Exhibit 3-89
Predicted Traffic Noise Levels during operation of Preferred Alternative**

RECEPTOR ¹	SITE DESCRIPTION	ASSUMED FUTURE LAND USE ²	NAC APPROACH ³	EXISTING	No-BUILD 2030	PREFERRED ALTERNATIVE 2030	CHANGE BETWEEN No-BUILD AND PREFERRED ALTERNATIVE
1	Palace of Fine Arts	Educational	68	71*	72*	70*	-2
2	Palace of Fine Arts	Educational	68	70*	71*	62	-9
3	Mason St Warehouse Building 1187/1183	Office	71	88	69	57	-12
4	Mason St Warehouse Building 1182	Office	71	68	69	56	-13
5	Mason St Warehouse Building 1183/1186	Office	71	88	68	57	-11
6	Mason St Warehouse Building 1184/1185	Office	71	69	70	60	-10
7	Building 803/Crispy Interpretative Center	Educational	68	68*	67*	54	-13
8	PX Building	Undetermined/Commercial	71	70	60	60	-10
9	Building 610/ Post Commissary	Museum	71	89	69	88	-1
10	Battery Blaney	Historic	68	75*	75*	72*	-3
11	Battery Slaughter	Historic	68	79*	80*	63	-17
12	Battery Sherwood	Historic	68	77*	77*	66*	-11
13	Battery Belkain	Historic	68	66*	67*	68*	+2
14	Building 644/ Unit Motor Foot	Undetermined/Commercial	71	83	64	61	+3
15	Building 649/ Army Reserves	Lodging	68	80	61	61	0
16	Building 650/ Stowell Hall	Lodging	68	81	60	59	-1
17	Lendrum Court Officers Quarters	Residential	68	84	65	85	0
18	1253 Armistead Road	Residential	68	71*	72*	77*	+5
19	Building 969/ Garage	Undetermined/Commercial	71	52	53	59	+6
20	Building 968/ Garage	Undetermined/Commercial	71	54	55	60	+5
21	Building 967/Film Vault	Undetermined/Commercial	71	58	57	65	+8
22	Building 966/Radio Receiver Station	Undetermined/Commercial	71	56	57	66	+8
23	Building 964/ Officer Family Housing	Residential	68	53	54	64	+10
24	Building 953/ Officer Family Housing	Residential	68	54	55	63	+8
25	Building 962/ Officer Family Housing	Residential	68	54	55	62	+7
26	Building 1669/ Data Center	Undetermined/Commercial	71	89	70	76*	+5
27	Log Cabin Picnic Area	Recreational	68	69*	69*	69*	0
28	Ft. Scott Chapel	Religious	68	81	63	85	+2
29	1298 S.orcey Ave./ Enlisted Family Housing	Residential	68	67*	68*	67*	-1

Exhibit 3-69 (Continued)
Predicted Traffic Noise Levels during operation of Preferred Alternative

RECEPTOR ¹	SITE DESCRIPTION	ASSUMED FUTURE LAND USE ²	NAC APPROACH ³	EXISTING	NO-BUILD 2030	PREFERRED ALTERNATIVE 2030	CHANGE BETWEEN NO-BUILD AND PREFERRED ALTERNATIVE
30	1297 Storey Ave./Enlisted Family Housing	Residential	66	68*	70*	69*	-1
31	1295 Storey Ave./Enlisted Family Housing	Residential	66	70*	71*	71*	0
32	1294 Storey Ave./Enlisted Family Housing	Residential	66	72*	73*	71*	-2
33	1293 Storey Ave./Enlisted Family Housing	Residential	66	73*	74*	72*	-2
34	1291 Storey Ave./Enlisted Family Housing	Residential	66	73*	74*	73*	-1
35	1290 Storey Ave./Enlisted Family Housing	Residential	66	73*	74*	74*	0
36	1289 Storey Ave./Enlisted Family Housing	Residential	66	70*	71*	73*	+2
37	1263 Storey Ave./Enlisted Family Housing	Residential	66	66*	67*	69*	+2
38	Building 682/ Cross Cultural Center	Educational	66	63	63	65	+2
39	Building 661/ Cavalry Stables	Park Police	71	66	67	60	-7
40	Building 662/Cavalry Stables	Cultural/Educational	66	66*	66*	63	-3
41	Building 663/Cavalry Stables	Cultural/Educational	66	65	65	63	-2
42	Building 667/Cavalry Stables	NPS Archives	71	66	67	67	0
43	National Cemetery Grave Site	Cemetery	66	72*	72*	57	-15
44	Building 129; Enlisted Family Quarters	Residential	66	65	65	71*	+6
45	Building 122/ Gym	Mixed Use	71	74*	75*	73*	-2
46	Building 108/ Storage/Electrical Shop	Undetermined/Commercial	71	74*	75*	73*	-2
47	Building 107/ Switching Station	Undetermined/Commercial	71	76*	77*	74*	-3
48	Building 104/ Barracks and Mess Hall	Office	71	70	70	71*	+1
49	Building 105/ Barracks and Mess Hall	Office	71	76*	76*	77*	+1
50	Building 106/ Band Barracks	Office	71	80*	80*	78*	-2
51	Building 211/ former Burger King	Restaurant	71	75*	76*	66	-10
52	Building 204/ Exchange Store	Office	71	68	69	Gone ⁴	NA
53	Building 210/ Guard House	Bank and Post Office	71	71*	71*	63	-8
54	Building 201/ Exchange Store	Office and Retail	71	65	68	Gone ⁴	NA
55	Building 220/ Bakers and Cooks School	Office	71	64	65	54	-11
56	Building 231/ Exchange Gas Station	Undetermined/Commercial	71	66	67	66	-1
57	Building 226/ Bakery	Retail	71	65	66	62	-4
58	Building 227/ Warehouse	Retail	71	64	65	59	-6
59	Building 223/ Warehouse	Office	71	60	61	57	-4

Exhibit 3-69 (Continued)
Predicted Traffic Noise Levels during operation of Preferred Alternative

RECEPTOR ¹	SITE DESCRIPTION	ASSUMED FUTURE LAND USE ²	NAC APPROACH ³	EXISTING	NO-BUILD 2030	PREFERRED ALTERNATIVE 2030	ALTERNATIVES	
							CHANGE BETWEEN NO-BUILD AND PREFERRED ALTERNATIVE	CHARGE BETWEEN NO-BUILD AND PREFERRED ALTERNATIVE
60	Building 230/ Warehouse	Retail or other use	71	67	68	60e ⁴	NA	NA
61	Building 1029/ Swords to Plowshares	Residential	66	63	64	60	-4	-4
62	Building 1030/ Swords to Plowshares	Residential	66	61	62	58	-4	-4
63	Building 1063/ Mexica Supply Warehouse	Water Recycling Facility	71	61	62	63	+1	+1
64	Building 1062/ Quartermaster Shop	Undetermined/Commercial	71	59	60	69	0	0
65	Building 1060/ Mexica Supply Warehouse	Undetermined/Commercial	71	58	59	59	+1	+1
66	Building 1187/ Gorgas Warehouse	Office	71	65	66	66	-1	-1
67	Building 1183/ Gorgas Warehouse	Office	71	64	65	64	0	0
68	Building 1169/ Gorgas Warehouse	Office	71	66	67	60	-2	-2
69	Building 1182/ Gorgas Warehouse	Office	71	62	63	60	0	0
70	Building 1170/ Gorgas Warehouse	Office	71	70	70	65	+2	+2
71	Building 1161/ Gorgas Warehouse	Office	71	66	66	65	+1	+1
72	Building 1160/ Gorgas Warehouse	Office	71	72*	71*	65	+1	+1
73	Building 1152/ Presidio YMCA Gym	Office	66	71*	71*	63	+1	+1
74	Building 1151/ Presidio YMCA Pool	Recreational/ Pool	66	74*	73*	72*	0	0
75	Building 1004/ Officers Quarters	Office	71	55	58	67	+1	+1
76	3234 Lyon Street	Residential	66	75*	76*	72*	-1	-1
		Number of sites approaching or exceeding the NAC		31	31	34		

Notes: ¹For details regarding the receptor location, see Appendix H of the Final Noise and Vibration Study, December 2004.
²Based on the Presidio Trust Management Plan and consultation with Presidio Trust and NFS staff. In cases where future land use was undetermined, the existing land use was assumed for future use.
³FHWA noise abatement criterion based on anticipated land use, as defined in Footnote 2 above. Approach is defined by Caltrans as being within 1 dBA of the noise abatement criterion.
⁴Indicates that this building is anticipated to be removed as part of the construction project.
⁵**Bolded** numbers indicate a noise level that approaches, equals, or exceeds the NAC.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. The mitigation measures described below are intended to minimize or eliminate temporary construction and permanent impacts.

As part of the construction noise plan and due to the uncertainty of construction noise, the areas adjacent to the construction zone, and deemed sensitive by the Trust and the NPS, will be monitored for changes in wildlife behavior. If distinct behavioral changes of concern are recorded, a plan will be developed to reduce noise levels to the maximum extent practicable.

The abatement measures considered for the traffic noise associated with the Preferred Alternative and TCD to reduce the predicted exterior traffic noise impacts were:

- Alteration of horizontal and vertical roadway alignment;
- Temporary and permanent noise barriers;
- Building insulation;
- Temporary relocation; and
- Construction Noise Plan

Alteration of Horizontal and Vertical Roadway Alignment

While the TCD minimizes impacts by reducing the need for building removal within the Doyle Drive corridor, it has also resulted in an increase in operational traffic noise levels at a number of buildings within the project area, most notably the Crissy Field Center. Because of the limited space to place the TCD between the existing roadway and nearby buildings, there are no further opportunities to adjust the alignment to reduce traffic noise.

Temporary Noise Barriers

When evaluating temporary noise barriers, a number of factors must be considered including:

- Lateral clearances (sufficient distances from the traveled way to the barrier);
- Sight distance requirements (providing for sufficient stopping sight distance);
- Access requirements for the properties being protected;
- Barrier dimensions (length and height);
- Construction materials; and
- Aesthetics.

Construction of a temporary noise barrier at sites that are on local streets such as Richardson Avenue, Lyon Street, Marina Boulevard, Mason Street, Lincoln Boulevard, Gorgas Avenue, Montgomery Street, Girard Road and Halleck Street will not be feasible because driveways will need to be maintained to provide access to those properties. As such, there appear to be no reasonable measures to reduce the predicted traffic noise with the TCD at Sites 1 and 2 (the Palace of

Fine Arts Building), Sites 6 (the Mason Street warehouses), Site 47 (Building 107), Site 49 (Building 105), Site 50 (Building 106), Site 70 and 72 (Gorgas Avenue warehouses), Site 73 (YMCA Building) and at Receptor 76 (residential area along Lyon Street and Richardson Avenue).

Site 7 (the Crissy Field Center) was also assessed for the potential to be benefited by the construction of temporary noise barriers along the TCD following the Caltrans protocol for the determination of reasonable and feasible noise barrier construction. The Caltrans protocol identifies a reasonable noise barrier as one that provides at least 5 dBA of traffic noise reduction at a reasonable cost. The cost effectiveness of a noise barrier is determined by a base allowance of \$32,000 per benefited receiver that is adjusted upwards based on the absolute noise levels predicted to occur, the increase between the Preferred Alternative and No-Build Alternative, the amount of noise reduction that can be achieved, and the antiquity of the impacted receptors in the project corridor. This provides for a total noise abatement allowance for noise barriers that are considered feasible. This protocol was applied to the noise barrier concepts discussed below.

Since the Caltrans protocol is based on a noise barrier wall design, all noise barriers were treated as though a wall was used. In fact, this may not actually be the final decision as the project progresses towards final design and construction. There are a wide variety of noise barrier options, in terms of both material and design that can minimize the visual impact as well as reducing the traffic noise level. The primary options include a rigid wall, an earth berm, or a combination of the two. There are also variations of the earth berm concept such as crib walls or living walls, which are typically a concrete structure in a triangular shape filled with soil and planted to resemble a mound of earth. The advantage of this design over an earth berm is that less horizontal space is required to achieve a similar height, which can be important in a limited space environment such as the Doyle Drive corridor.

Within the rigid wall concept, which is probably the most common structural noise abatement method employed, there are a number of combinations of design elements including glass, plastic, metal, concrete, steel, and other materials. The details of the noise abatement option will be coordinated during the design phase for any noise barrier option that is determined to be preliminarily reasonable and feasible. This will give all interested parties the opportunity to provide input into the aesthetics of the barrier as well as the materials to be employed. Due to the constraints that may be placed on noise barrier design such as utility locations, drainage, structural loading limits, and maintenance issues, the specific type of barrier material to be used and the exact placement of the barrier can only be estimated at this time. Where visual impacts may result from the placement of a noise barrier, a decision will have to be made as to what constitutes a reasonable compromise between the two in order to accommodate both desires.

A variety of noise barriers at the Crissy Field Center were investigated at heights of 2.44 to 4.88 meters (8 to 16 feet) and at lengths varying from 117 to 147

meters (384 to 482 feet). The barrier was analyzed as though it was placed at the edge of the safety shoulder of the roadway along the north side of the TCD and optimized at 3.05 meters (ten feet) in height and 117 meters (384 feet) in length. The barrier wall is predicted to achieve a 6 dBA reduction at these dimensions.

The most recent Caltrans information regarding noise barrier costs was employed, which includes a base allowance of \$32,000 with an increase of \$4,000 because the absolute noise levels are between 70 and 74 dBA. An additional \$2,000 was allowed because the build versus existing noise levels are between 3 and 7 dBA. Another \$2,000 was added because the achievable noise reduction was between 6 and 8 dBA. Finally, an additional \$10,000 was incorporated into the allowable amount because the building pre-dated 1978. This created a total reasonable allowance for this site of \$50,000.

Using the current unit cost for a masonry wall, the estimated cost of the temporary noise barrier is \$150,623, which exceeds the allowable cost of \$50,000. Therefore it was determined that a temporary noise barrier was not a reasonable approach to traffic noise reduction at the Crissy Field Center. Alternative materials for the noise barrier were not investigated as the Crissy Field Center operations will be relocated during construction.

Exhibit 3-70 illustrates the results of an assessment of the reasonableness and feasibility of providing a temporary noise barrier in the vicinity of the Crissy Field Center and permanent noise barriers at Storey Avenue and Armistead Road.

Exhibit 3-70
Noise Barrier Preliminary Reasonableness Determination

ELEMENTS	TEMPORARY NOISE BARRIER	PERMANENT NOISE BARRIER	PERMANENT NOISE BARRIER
Location	Crissy Field Center	Storey Avenue	Armistead Road
Length	117 meters (383.88 feet)	565 meters (1,853.7 feet)	318 meters (1,043.3 feet)
Height	3.05 meters (10 feet)	4.88 meters (16 feet)	3.05 meters (10 feet)
Preliminary Reasonable Cost Allowance Benefit Unit ¹	\$50,000	\$46,000	\$54,000
Number of Benefited Units	1	0	5
Preliminary Reasonable Barrier Total Construction Cost Allowance	\$50,000	\$0	\$270,000
Estimated Barrier Construction Cost	\$150,623	\$1,163,787	\$409,385
Preliminary Reasonable (Yes/No)	No	No	No

Source: *Environmental Science Associates, 2004, 2006.*

Notes: ¹Based on Caltrans TNAP, October 1998 as modified in 2006.

Permanent Noise Barrier

The evaluation of permanent noise barriers followed the Caltrans reasonableness protocol which was presented in the discussion of Temporary Noise Barriers. Permanent noise barriers are not a viable solution for all areas with noise increases. For example, the houses along Lyon Street are properties that need driveways for access and therefore, noise barriers are not a viable solution. For the areas which would benefit from permanent noise barriers, the evaluation of whether the noise barrier is a viable option followed the Caltrans reasonableness protocol which was presented above in the discussion of Temporary Noise Barriers. **Exhibit 3-70** illustrates the results of an assessment of the reasonableness and feasibility of providing a temporary noise barrier in the vicinity of the Crissy Field Center and permanent noise barriers in at Storey Avenue and Armistead Road.

A noise barrier for the houses on Storey Avenue (receptors 27 through 36) was investigated and found not to be an effective noise abatement measure. A 4.88-meter-high (16-foot) wall along the south side of the eastbound section of Doyle Drive extending from west of the Log Cabin area to the southbound Park Presidio off-ramp would reduce noise by 1.7 dBA, well below the required 5 dBA standard for feasibility. This is due to the topographic conditions of the area. A barrier outside of the right-of-way along the top of the ridge bordering Doyle Drive may reduce traffic noise but would require additional right-of-way in the area of the Log Cabin. This location contains identified sensitive habitat

that could be adversely affected by the construction of a wall. Therefore, abatement at this location was not considered reasonable or feasible.

A barrier could reduce noise by approximately 10 dBA at the five affected residential receptors located north of Doyle Drive in the area along Armistead Road. This wall would measure 3.05-meter-high (10-foot) and 318 meters long (1,043 feet) and would extend along the edge of the Doyle Drive right of way line along the northbound on-ramp from Veterans Boulevard to Doyle Drive and extend westward to Merchant Road. Results of the initial investigation indicate that this barrier would not be feasible according to the Caltrans protocol. In addition, the soundwall was determined to not be desirable or consistent with the cultural landscape of the Presidio. The Presidio Trust as land managers have indicated that the benefits from building this soundwall would be outweighed by the negative effects on the cultural landscape. This determination was made through the application of the historic preservation and architectural criteria developed for the Doyle Drive Project as part of the *Built Environment Treatment Plan*. The *Built Environment Treatment Plan* is part of the *Programmatic Agreement* which was developed as part of the Section 106 process to document the measures which will be taken to mitigate the adverse effects of the Project on cultural and historic resources.

Building Insulation

Insulating the Crissy Field Center was given detailed consideration in an attempt to insure that the interior noise levels will not approach or exceed the FHWA Interior NAC of 52 dBA as a result of the operation of the Preferred Alternative and TCD. Given the type of building structure (masonry with single-glazed windows) found at the Crissy Field Center, it could be reasonably assumed that the noise reduction (exterior to interior) will be on the magnitude of 49 dB (minus the lower reduction for the windows, which will be on the order of 24 dB) using the HUD guidance offered in *The Noise Guidebook*. Therefore, an effective inside/outside reduction on the order of 25 dB could be expected with the doors and windows closed. This will reduce the predicted TCD interior noise level to approximately 50 dB, which is 2 dB below the FHWA interior criteria found in the NAC.

Given this anticipated condition, additional noise reduction will not be required to ensure that the interior space will continue to be usable as an educational facility during the operational phase of the Preferred Alternative. However, this may not be the case during use of the TCD. With the concern for the ability of the Crissy Field Center to fulfill its educational function during the construction period, it has been determined that building insulation is not a practical approach, since many of these educational activities involve both indoor and outdoor settings.

Temporary Relocation

After considerable efforts to identify a method to minimize or eliminate the potential impacts at the Crissy Field Center from the TCD, it has been determined that practical methods to accomplish this is very limited. Therefore, based on the concerns expressed by the owners of the Crissy Field Center, it has been determined that the functions of the Crissy Field Center will be temporarily relocated during the construction phase to a more suitable location. This will insure that the Crissy Field Center will be able to continue to function as an educational facility without any construction noise impacts. Following the construction period, the functions of the Crissy Field Center can be relocated back to the current location.

Construction Noise Plan

Although construction noise is not expected to have any substantial impacts on the human environment (including the recreational areas of Crissy Field and Crissy Marsh), a detailed construction noise plan will be developed for inclusion into the construction contract documents. This plan will include the specifications found in the current version of the *Caltrans Standard Specifications* related to noise control as well as those found in the *Caltrans Standard Special Provisions*. In addition to the noise-related specifications found in the *Caltrans Standard and Special Specifications*, the plan will include noise field monitoring of construction impacts. This monitoring will be conducted in concert with the Trust and NPS staffs, using monitoring sites and meteorological conditions that are consistent with standard practices for this type of activity. Monitoring will be limited to times when construction activities are taking place and will focus on those areas identified in the Affected Environment portion of this discussion. All noise levels will be reported in A-weighted decibels using the Leq(1h) descriptor. If the noise levels observed are determined to be excessive, the Contractor will make adjustments in the field operations to reduce the noise level to the extent that is practicable.

Vibration

This section discusses the effects of vibration on buildings and their occupants within the Doyle Drive Project study area. The vibration study evaluates vibrations caused by both the construction of the project and future traffic volumes on Doyle Drive.

Regulatory Setting

The San Francisco Department of Public Works and Caltrans include specifications on vibration limits in their construction contracts to minimize the risk of damage to buildings and other structures. These limits are defined in terms of Peak Particle Velocity (PPV). PPV is the term for the highest velocity attained during a vibratory event.

Comparison of Building Damage and Human Comfort Criteria

The occupants of buildings can often feel vibrations even though the vibration causes no damage to the building. **Exhibit 3-71** summarizes the effects of continuous vibration on people and building structures. These data indicate that a vibration can become unpleasant and lead to complaints well before causing any risk of even superficial structural damage to most buildings.

The measurements in **Exhibit 3-71** can also be applied to buildings of historic interest. Therefore, the PPV measurement -- 2.0 millimeters per second (mm/sec) or 0.08 inches per second (in/sec) -- would apply to the historical buildings in the Presidio, particularly the masonry buildings that are susceptible to damage. Even though a vibration of 2 mm/sec (0.08 in/sec), particularly from intermittent construction (including sustained pile-driving), is unlikely to cause structural damage to a building, it could produce floor vibration levels high enough to disturb the people in a building. Thus, a ground vibration velocity not exceeding 2 mm/sec (0.08 in/sec) PPV was used to establish preliminary buffer distances from impact pile driving.

Exhibit 3-71
Effects of Continuous Vibration on People and Buildings

VIBRATION LEVEL (PEAK PARTICLE VELOCITY)			
MILLIMETERS PER SECOND (MM/SEC)	INCHES PER SECOND (IN/SEC)	HUMAN REACTION	EFFECT ON BUILDINGS
0.15 – 0.30	0.006 – 0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling – houses with plastered walls and ceilings
10-15	0.4 – 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: "A Survey of Traffic-induced Vibrations" by Whiffen and Leonard, Transport and Road Research Laboratory, RRL Report LR418, Crowthorne, Berkshire, England, 1971.

Note: The vibration levels are based on peak particle velocity in the vertical direction. Where human reactions are concerned, the value is at the point at which the person is situated. For buildings, the value refers to the ground motion. No allowance is included for the amplifying effect, if any, of structural components.

Affected Environment

Many of the historic buildings within this national historic landmark are within the project area, which comprises a large number of masonry and wood frame buildings. These structures may be susceptible to vibratory damage.

Methodology

The assessment of vibration effects is based on reviews of the plans of the current Doyle Drive alignment and the preliminary plans of the Replace and Widen and the Presidio Parkway Alternatives. Methods included gathering vibration data during the 2002 study of existing vibration levels near historic buildings, and reviewing published construction-generated vibration data and existing and projected future traffic volumes on Doyle Drive and other roadways in the project study area.

General Vibration Impacts

Existing Vibrations

Baseline vibration levels were measured in April 2002 during a period when traffic was freely flowing on both Doyle Drive and Veterans Boulevard. **Exhibit 3-72** summarizes the locations and their descriptions.

Existing vibration levels were established at the following sensitive sites:

- **Location 1A** — Historical wood-frame buildings, adjacent to the existing Doyle Drive near Halleck Street (Buildings 201, 204 and 230)
- **Location 2** — Historic brick buildings at the Main Post locations (Buildings 105, 106 and 107)
- **Location 3** — Veterans Boulevard tunnel on Washington Boulevard. Two vibration measurement locations spaced 15 meters (50 feet) apart were used over the top of the tunnel to ensure that maximum levels of vibration were obtained. The measured data were similar and have been averaged for presentation in this report.

Exhibit 3-72
Measurement Locations Descriptions

LOCATIONS	DESCRIPTION
1A	At the foundation base of the northwest corner of Building 201, approximately eight meters (27 feet) from the curb of Halleck Street and approximately 17 meters (55 feet) from the nearest support column of Doyle Drive
1B	At the base of a southern support column of Doyle Drive, approximately 17 meters (55 feet) north of Location 1a.
2	At the foundation base of the northeast corner of Building 105, approximately five meters (15 feet) from the curb of Lincoln Boulevard., immediately west of Doyle Drive.
3	On the concrete curb of Washington Boulevard, directly over the top of the Veterans Boulevard Tunnel.

Ambient vibrations were measured for a period of 15 minutes at each location. At Location 1B, the base of the Doyle Drive support column, and Location 1A, the northwest corner of Building 201, vibration levels approach or exceed the threshold of human perception. The highest PPV recorded at Location 1B was approximately 2 mm/sec (0.08 in/sec).

The highest PPV recorded at Location 1A was approximately 0.5 mm/sec (0.02 in/sec), well below the conservative 2 mm/sec (0.08 in/sec) threshold for damage for historical buildings.

These findings are consistent with those of other studies, including a Caltrans investigation, which determined that traffic-generated ground vibration is not normally strong enough to cause any risk of structural damage to adjacent buildings.

During construction, a PPV of 2 mm/sec (0.08 in/sec) is a conservative, and an appropriate limit for the historic buildings of masonry construction, which includes most of the buildings in the Main Post area of the Presidio. Some of these brick buildings show differential settlement and have cracks in their facades.

Most of the other historical buildings in the Presidio are wood-framed structures, which are less susceptible to damage from vibration. For most of these buildings, a higher PPV of 5 mm/sec (0.2 in/sec) would be an appropriate limit for construction vibration. The exterior facades of some of these wood-framed buildings are in poor condition, although the buildings are structurally sound.

Temporary Impacts

This temporary impacts discussion focuses on the Preferred Alternative.

The equipment used to construct the Preferred Alternative will cause temporary vibration impacts in the project area. **Exhibit 3-73** shows the typical vibration levels caused by various types of equipment at a distance of 7.5 meters (25 feet).

The Preferred Alternative requires work on roads other than Doyle Drive, particularly near the east end of the project. Implementing appropriate vibration management procedures can reduce the risk of structural damage to the historical buildings and structures within the Presidio, and the Palace of Fine Arts.

The following sections summarize the equipment and activities that are likely to generate the highest levels of ground vibration during construction.

Exhibit 3-73
Vibration Source Levels for Construction Equipment

EQUIPMENT		PPV AT 7.5 M (25 FT) [IN MM/SEC IN/SEC]	APPROXIMATE L _v AT 7.5 M (25 FT)
Pile Driver (impact)	upper range	38.6 (1.518)	112
	typical	16.4 (0.644)	104
Pile Driver (sonic)	upper range	18.6 (0.734)	105
	typical	4.3 (0.170)	93
Clam shovel drop (slurry wall)		5.1 (0.202)	94
Hydromill (slurry wall)	in soil	0.2 (0.008)	66
	in rock	0.4 (0.017)	75
Large bulldozer		2.3 (0.089)	87
Caisson drilling		2.3 (0.089)	87
Loaded trucks		1.9 (0.076)	86
Jackhammer		0.9 (0.035)	79
Small bulldozer		0.08 (0.003)	58

Pile Driving

The Preferred Alternative requires piles along much of the route, including the section of tunnel adjacent to the Main Post. Piles will support the tunnel road structure, and shoring will be installed during the excavation of the tunnel.

Hydraulic power units used for pile driving and other continuously operating equipment such as compressors can be strategically located to reduce both noise and vibration at sensitive buildings. This equipment, therefore, should not cause structural damage.

Dynamic Compaction

The Preferred Alternative will require compacting the road surfaces using vibratory rollers along much of the route. This also applies to existing roads that will be reconstructed as part of the Preferred Alternative. These include Palace Drive (adjacent to the Palace of Fine Arts), Halleck Street, Girard Road, Gorgas Avenue, Lincoln Boulevard, Crissy Field Avenue, and temporary construction (haul) roads.

Blasting

Blasting is generally the most cost-effective and fastest means of breaking rock. Blasting may be used in the area of the Park Presidio Interchange. Vibrations of preliminary test blasts, using low charge weights, will be monitored to assist in the blast design. Blasting will comply with conservative ground vibration limits at the closest buildings. Vibrations will be monitored during subsequent blasting, and potentially affected structures will be surveyed both before and after

construction. If blasting is not permitted, some form of mechanical means of rock breaking and extraction will be used in the Park Presidio Interchange area.

Demolition

Demolition of the low-viaduct by cutting the structure into sections that will be progressively dropped to the ground may cause strong vibrations. When demolition occurs near historical buildings that are susceptible to damage, lowering the sections by crane rather than dropping them to the ground could reduce vibration levels. Another method is to drop the sections onto earthen cushions. The vibrations caused by dropping sections of the low-viaduct to the ground (with and without an earthen cushion) will be measured in areas that are not sensitive to vibration before the low-viaduct is demolished near historical buildings.

Using hoe rams or other hydraulic breakers to break existing reinforced concrete structures on the ground may also produce strong vibrations. However, the vibration levels are likely to be lower than those generated by dropping the components to the ground.

Trucks

Truck movements on temporary construction routes will not normally produce vibrations strong enough to cause damage to adjacent historical buildings. However, people in the buildings might feel the vibrations. Vibration levels may increase if the surface of the road pavement is poorly maintained.

Permanent Impacts

The data on existing traffic counts and counts projected for 2030 indicate that traffic volumes will increase slightly on Doyle Drive from now to 2030. Traffic volumes for the build alternative vary slightly from those for the No-Build Alternative, as shown in **Exhibit 3-74**. Because of their weight, trucks are the main cause of maximum ground vibrations from roadways. Assuming that the percentage of trucks and other heavy vehicles stays the same vibrations caused by traffic would not change.

Alternative 1: No-Build

The No-Build Alternative would not result in any permanent impacts.

Alternative 2: Replace and Widen

Permanent impacts resulting from Alternative 2 are the same for both build alternatives. Impacts are discussed below.

Exhibit 3-74
Existing and Future AM and PM Peak Hour Traffic Volumes on Doyle Drive

LOCATION	TIME (PEAK HOUR)	BASE CASE (2000)	NO-BUILD (2030)	REPLACE & WIDEN (2030)	PRESIDIO PARKWAY CIRCLE (2030)	PRESIDIO PARKWAY DIAMOND (2030)
Toll Plaza to Veterans Boulevard	AM	9,140	11,460	11,430	11,650	11,640
Toll Plaza to Veterans Boulevard	PM	8,770	11,290	12,000	11,700	12,060
Veterans Boulevard to Richardson Avenue	AM	7,250	7,930	7,980	7,840	7,950
Veterans Boulevard to Richardson Avenue	PM	7,230	8,400	8,650	8,630	8,710

Alternative 5: Presidio Parkway

Permanent impacts resulting from Alternative 5 are the same for both build alternatives. Impacts are discussed below.

Alternative 2: Replace and Widen and Alternative 5: Presidio Parkway

The Replace and Widen Alternative would require moving the elevated roadway support columns closer to some historical buildings. Likewise, the Presidio Parkway Alternative would move the entire alignment closer to historical buildings. In addition, the Presidio Parkway Alternative would change the existing elevated alignment to an at-grade alignment in some areas.

The current levels of ground vibration outside the historical buildings near Doyle Drive are unlikely to cause perceptible floor vibrations inside the buildings. Future ground vibrations, even if stronger, would not necessarily cause perceptible interior floor vibrations.

Building 106, which would continue to be office space, in the Main Post area would be the closest building to the Presidio Parkway, about eight meters (26 feet) from the center of the nearest traffic lane, which would be four meters (13 feet) below grade.

The worst-case ground vibration velocity at Building 106 could be up to 1.4 mm/sec (0.06 in/sec) PPV at eight meters (26 feet). This would exceed the threshold of perception of 0.15 mm/sec to 0.30 mm/sec. The worst-case velocity is based on data from a Caltrans vibration study that measured the maximum truck vibration levels. However, given that the surface of the roadway would be smooth, vibrations at the closest corner of Building 106 should not exceed a PPV of 0.5 mm/sec (0.02 in/sec). Furthermore, Building 106 is heavier than modern structures and would react less to ground vibrations than a modern

building. Interior floor vibrations would be lower than those at the exterior corner of the building.

Even if the future vibration is perceptible, it is predicted that the vibration in the areas within Building 106 closest to Doyle Drive would not be unduly intrusive or annoying.

Preferred Alternative: Refined Presidio Parkway

The data on existing traffic counts and counts projected for 2030 indicate that traffic volumes will increase slightly on Doyle Drive from now to 2030. Because of their weight, trucks are the main cause of maximum ground vibrations from roadways. Assuming that the percentage of trucks and other heavy vehicles stays the same, vibrations caused by traffic will not change.

The Preferred Alternative will require moving the entire alignment closer to historical buildings. In addition, the Preferred Alternative will change the existing elevated alignment to an at-grade alignment in some areas.

The current levels of ground vibration outside the historical buildings near Doyle Drive are unlikely to cause perceptible floor vibrations inside the buildings. Future ground vibrations, even if stronger, will not necessarily cause perceptible interior floor vibrations.

Building 106, which will continue to be office space, in the Main Post area would be the closest building to the roadway, about eight meters (26 feet) from the center of the nearest traffic lane, which will be four meters (13 feet) below grade.

The worst-case ground vibration velocity at Building 106 could be up to 1.4 mm/sec (0.06 in/sec) PPV at eight meters (26 feet). This will exceed the threshold of perception of 0.15 mm/sec to 0.30 mm/sec. The worst-case velocity is based on data from a Caltrans vibration study that measured the maximum truck vibration levels. However, given that the surface of the roadway will be smooth, vibrations at the closest corner of Building 106 should not exceed a PPV of 0.5 mm/sec (0.02 in/sec). Furthermore, Building 106 is heavier than modern structures and will react less to ground vibrations than a modern building. Interior floor vibrations will be lower than those at the exterior corner of the building.

Even if the future vibration is perceptible, it is predicted that the vibration in the areas within Building 106 closest to Doyle Drive will not be unduly intrusive or annoying.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. The following vibration management measures will be required (as needed) within the area of the Presidio (including the Crissy Field Center) and/or Palace of Fine Arts to maintain vibrations at acceptable levels during construction:

- Appropriate construction vibration limits will be incorporated in the construction documents. The recommended ground vibration limits are a PPV not exceeding 5 mm/sec (0.20 in/sec) next to the closest facades of wood-framed historical buildings in good condition, and a PPV not exceeding 2 mm/sec (0.08 in/sec) next to the closest facades of historical buildings that are susceptible to damage (buildings of masonry construction and other buildings in a poor structural condition).
- Impact pile driving will not be used within 60 meters (200 feet) of fragile historic structures.
- As an alternative to driven piles, several methods of pile placement are available to the construction contractor that will reduce noise and vibration impacts, including cast in drilled hole (CIDH) pile placement, screw piles or press-in piles.
- Contractors will monitor vibrations and consider using lighter rollers when compacting soil, particularly with a heavy roller, within 20 meters (65 feet) of historical buildings that are susceptible to damage (for example, the masonry structures or buildings in poor structural condition). Vibratory rollers will not be stopped or started near sensitive buildings to avoid resonance effects.
- Demolition operations will be modified as necessary to reduce the vibrations caused by dropping demolished viaduct structures onto the ground near historical buildings. Alternative methods include lowering demolished viaduct structures by crane or dropping the sections onto earthen cushions. If earthen cushions are used, their effectiveness in reducing vibration will first be evaluated in less sensitive areas of the project site.
- Demolished sections of the viaduct will be placed as far as possible from the historic buildings before they are broken up.
- Buildings that could be affected by demolition or construction activities will be inspected before work begins. Crack monitors will be installed where any substantial existing cosmetic or structural cracks are found in the pre-construction surveys and checked as construction proceeds. These buildings will be inspected immediately after completing the activity.
- Before and during construction activities that will generate high levels of ground vibration, vibration levels will be monitored next to the facades of the closest historical buildings. If the limits are exceeded, the work causing the excessive vibrations must immediately cease. The contractor will investigate modifying the work or using alternate procedures to reduce vibration levels before resuming work.

If blasting is permitted, it will comply with conservative ground vibration limits at the closest buildings. Vibrations will be monitored during preliminary test blasts, which will use low charge weights, and subsequent blasts. Potentially affected structures will be surveyed both before and after construction.

The contractor will inform the Trust and the occupants of potentially affected buildings, particularly people living in the Riley Avenue and Ruckman Avenue houses, about the construction schedule, its progress, and the hours of work. The contractor will give adequate notice to residents and building occupants before work begins near their buildings. They will be advised that construction noise and vibration might cause them some disruption, but that extensive measures have been taken to carefully monitor vibrations and maintain vibrations at levels that will not cause damage to any building.

3.3.6 Energy

This section assesses the impact of the Doyle Drive Project alternatives on transportation-related energy consumption in the study corridor for the design year 2030. 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.

Regulatory Setting

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 U.S. Environmental Protection Agency (EPA) administers the Corporate Average Fuel Economy (CAFE) program, which ensures that vehicle manufacturers are in compliance with the standards.

The *California Environmental Quality Act* (CEQA) requires that a discussion of the potential energy impacts of a proposed project be addressed, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary energy consumption.

Affected Environment

Existing (year 2000) energy consumption in the study area consists of direct energy consumption resulting from automobile and transit operations. Automobile and transit operations are quantified using annual vehicle miles traveled (VMT). The existing annual VMT for passenger vehicles, heavy trucks, and transit vehicles in the Doyle Drive corridor results in the consumption of approximately 125,000 barrels of oil.

Exhibit 3-75 shows the fuel consumption rates, as measured in British thermal units (BTUs), which were used in the analysis. One BTU is the quantity of energy necessary to raise one pound of water one degree Fahrenheit. These rates were developed by Oak Ridge National Laboratory and published in 1993 by the U.S. Department of Energy in the *Transportation Energy Data Book: Edition 16*.

**Exhibit 3-75
Energy Consumption Rates**

VEHICLE TYPE	ENERGY CONSUMPTION/VEHICLE MILE
Passenger Vehicles (auto, van, light truck)	6,233 BTU
Heavy Trucks (3 or more axles)	22,046 BTU
Transit Bus (all vehicle types)	41,655 BTU

Source: U.S. Department of Energy, 1993

Temporary Impacts/Indirect Energy

Indirect energy involves the one-time, non-recoverable 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. An Input-Output method was used to estimate construction energy consumption for each of the alternatives. This method converts either VMT or year 2000 construction dollars into energy consumption based on existing data of other roadway improvement projects in the U.S. Indirect energy also involves the manufacturing and maintenance of vehicles. This includes passenger vehicles, heavy trucks, and transit buses.

Estimates of the indirect energy consumption under each alternative are provided in **Exhibit 3-76**. This table also shows the BTU-equivalent barrels of crude oil. The energy consumption estimates listed under the construction category represent a one-time expenditure of energy. A discussion of the indirect energy consumption impacts of each alternative is provided on the following pages.

Exhibit 3-76
Estimates of Annual Indirect Energy Consumption in Year 2030

	ALTERNATIVE				
	NO-BUILD	REPLACE AND WIDEN AND W/DETOUR	REPLACE AND WIDEN W/DETOUR	PRESIDIO PARKWAY DIAMOND AND PREFERRED	PRESIDIO PARKWAY CIRCLE DRIVE
CONSTRUCTION¹ (in millions BTU)					
Passenger Vehicle and Heavy Truck Manufacturing	173,471	175,242	175,242	177,013	176,659
Transit Bus Manufacturing	3,308	3,308	3,308	3,308	3,308
Roadway	0	534,937	534,937	681,385	681,385
Structures	0	1,862,123	2,131,030	2,156,368	2,156,368
Total Construction	176,779	2,575,610	2,844,517	3,018,074	3,017,720
MAINTENANCE² (in millions BTU)					
Passenger Vehicle and Heavy Truck	172,240	173,999	173,999	175,758	175,406
Transit Bus	12,527	12,527	12,527	12,527	12,527
Total Maintenance	184,767	186,526	186,526	188,285	187,933
SUMMARY					
Total BTU's (in millions)	361,546	2,762,036	3,031,043	3,206,359	3,205,653
Total Barrels of Oil ¹	62,336	476,230	522,594	552,821	552,699
Change in Barrels of Oil from No-Build Alternative	N/A	x 7.6	x 8.4	x 8.9	x 8.9

Source: Parsons Brinckerhoff, Inc., August 2004.

Notes: ¹Construction Energy Conversions (Caltrans, 1983):

Vehicle construction energy:

Passenger vehicles and heavy trucks - 1,410 BTUs/VMT
 Transit bus - 3,470 BTUs/VMT
 Roadway - 27,500 BTUs/1977\$
 Structures - 50,100 BTUs/1973\$

²Maintenance Conversions (Caltrans, 1983):

Passenger vehicles and heavy trucks - 1,400 BTUs/VMT
 Transit bus - 13,142 BTUs/VMT

Alternative 1: No-Build

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. Based on energy consumption conversions provided in **Exhibit 3-76**, the manufacturing and maintenance of such vehicles would consume approximately 62,300 barrels of oil in the design year 2030.

Alternative 2: Replace and Widen

The energy analysis indicates that the options for the Replace and Widen Alternative each have a different impact on energy. The following discusses the indirect energy impacts for each option.

No-Detour Option

The Replace and Widen (No-Detour Option) Alternative's maintenance costs are equivalent to 32,200 barrels of oil, similar to the No-Build Alternative, but slightly higher due to the higher VMT. Construction costs, however, would be much higher, as this alternative would entail the reconstruction or rehabilitation of both viaduct structures. Based on energy consumption conversions provided in **Exhibit 3-76**, the construction costs would result in the consumption of approximately 444,000 barrels of oil. The total indirect energy consumption for the No-Detour Option would be equivalent to approximately 476,200 barrels of oil, which amounts to seven-and-a-half times the consumption anticipated under the No-Build Alternative.

With Detour Option

The Replace and Widen (With Detour Option) Alternative's maintenance costs are equivalent to 32,200 barrels of oil, exactly the same as the option without the detour. Construction costs, however, would be higher, as this alternative would add a detour structure to be used during the reconstruction/ rehabilitation process. Based on energy consumption conversions provided in **Exhibit 3-76**, the construction costs would result in the consumption of approximately 490,400 barrels of oil (a ten percent increase over the No-Detour Option). The total indirect energy consumption for the With Detour Option would be equivalent to approximately 522,600 barrels of oil, which amounts to eight-and-a-half times the consumption anticipated under the No-Build Alternative.

Alternative 5: Presidio Parkway

The Diamond and Circle Drive Options of the Presidio Parkway Alternative are grouped together in this discussion because the inputs for the indirect energy analysis (VMT and construction costs) are not significantly different. Both options would result in the highest indirect energy consumption of all study alternatives. Based on energy consumption conversions provided in **Exhibit 3-76**, construction activities would result in the consumption of approximately 520,300 barrels of oil and the maintenance of passenger vehicles, heavy trucks, and transit vehicles would result in the consumption of approximately 32,400 barrels of oil. The total indirect energy consumption for the Presidio Parkway Alternative would be equivalent to approximately 552,800 barrels of oil, which amounts to nine times the indirect energy consumption of the No-Build Alternative, 16 percent more than the Replace and Widen (No-Detour Option) and six percent more than the Replace and Widen (With Detour Option).

Preferred Alternative: Refined Presidio Parkway

The temporary impacts resulting from this impact are the same for Alternative 5, Diamond Option.

Permanent Impacts

Permanent impacts to energy include the use of energy directly expended by the vehicles which use the facility.

The method used to estimate long-term (direct) energy consumption is outlined in the *Reporting Instructions for the Section 5309 New Starts Criteria* (USDOT, 2002). Direct energy consumption involves the fuel needed by all of the vehicles (automobile, truck, bus, or transit lane vehicle) in the study corridor. In assessing the direct energy impact, the following factors were used:

- Annual vehicle miles traveled for passenger vehicles, heavy trucks, and transit buses; and
- Fuel consumption rates by vehicle type.

Daily traffic volumes and total VMT for the corridor (year 2030) were used in the direct energy analysis for each alternative. The 2030 daily traffic volumes for the corridor were developed as part of the traffic modeling process.²⁸ The daily VMT was annualized using a factor of 335 days/year.²⁹

Estimates of the annual direct energy consumption, in BTUs, in the year 2030 under the No-Build, Replace and Widen, Presidio Parkway, and Preferred Alternatives are provided in **Exhibit 3-77**. This table also shows the BTU-equivalent barrels of crude oil consumed under each alternative. A discussion of the direct energy consumption impacts of each alternative is provided on the following pages.

²⁸ The VMT for heavy trucks was developed using detailed vehicle axle data for 22 roadway segments in the project area, as reported in the 2003 Annual Average Daily Truck Traffic Report (Caltrans, 2004).

²⁹ To annualize average weekday VMT, the factor of 335 was used to account for variations in VMT due to holidays and weekends.

Exhibit 3-77
Estimates of Annual Direct Energy Consumption in Year 2030

	ALTERNATIVE				
	NO-BUILD	REPLACE AND WIDEN NO-DETOUR	REPLACE AND WIDEN W/DETOUR	PRESIDIO PARKWAY DIAMOND AND PREFERRED	PRESIDIO PARKWAY CIRCLE DRIVE
PROJECTED VEHICLE MILES TRAVELED (in thousands)					
Daily Passenger Vehicle	366.1	369.9	369.9	373.6	372.9
Annual Passenger Vehicle	122,660	123,912	123,912	125,165	124,914
Daily Heavy Truck	1.10	1.11	1.11	1.12	1.12
Annual Heavy Truck	369.1	372.9	372.9	376.6	375.9
Daily Transit Bus	2.8	2.8	2.8	2.8	2.8
Annual Transit Bus	953.2	953.2	953.2	953.2	953.2
ESTIMATED BTU'S (in millions)					
Passenger Vehicle	764,538	772,344	772,344	780,151	778,590
Heavy Truck	8,137	8,220	8,220	8,303	8,286
Transit Bus	39,706	39,706	39,706	39,706	39,706
SUMMARY					
Total BTU's (in millions)	812,381	820,270	820,270	828,160	826,582
Total Barrels of Oil ¹	140,066	141,426	141,426	142,786	142,514
Change in Barrels of Oil from No-Build Alternative	N/A	+ 0.97%	+ 0.97%	+ 1.94%	+ 1.75%

Source: Parson Brinckerhoff, Inc., August 2004.

Note: ¹ Barrel of Oil = 5.8 million BTUs (USDOT 2002)

Alternative 1: No-Build

Under the No-Build Alternative, the year 2030 VMT for passenger vehicles (automobiles, vans and light trucks) and heavy trucks in the Doyle Drive corridor is projected to be approximately 123.0 million miles and approximately 953,200 miles for transit buses. Based on energy consumption rates provided in **Exhibit 3-77**, these vehicles would consume approximately 812 billion BTUs, or approximately 140,000 barrels of oil, in the year 2030.

Alternative 2: Replace and Widen

The Replace and Widen Alternative, No-Detour with With Detour Options are grouped together in this discussion because the input for the direct energy analysis (VMT) is not different. Under these alternatives, the year 2030 VMT for passenger vehicles in the Doyle Drive corridor is projected to be approximately 124 million miles and approximately 953,200 miles for transit buses. Based on

energy consumption rates provided in **Exhibit 3-77**, these vehicles would consume approximately 820 billion BTUs, or approximately 141,000 barrels of oil, in the year 2030.

Alternative 5: Presidio Parkway

The energy analysis indicates that the options for the Presidio Parkway Alternative each have a different impact on energy. The following discusses the direct energy impacts for each option.

Diamond Option

Under the Presidio Parkway Alternative, Diamond Option, the year 2030 VMT for passenger vehicles in the Doyle Drive corridor is projected to be approximately 125 million miles and approximately 953,200 miles for transit buses. Based on energy consumption rates provided in **Exhibit 3-77**, these vehicles would consume approximately 828 billion BTUs, or approximately 143,000 barrels of oil, in the year 2030.

Circle Drive Option

Under the Presidio Parkway Alternative, Circle Drive Option, the year 2030 VMT for passenger vehicles in the Doyle Drive corridor is projected to be approximately 125 million miles and approximately 953,200 miles for transit buses. Based on energy consumption rates provided in **Exhibit 3-77**, these vehicles would consume approximately 827 billion BTUs, or approximately 143,000 barrels of oil, in the year 2030.

While facility-operation components are not included in this analysis, it should be noted that an additional direct energy expenditure would be required to operate tunnel segments in the Presidio Parkway Alternative. Tunnel components that require energy to operate include ventilation fans, lighting, and drainage pumps. It is estimated that the operation of these tunnel components would result in an additional 13 billion BTUs (approximately 2,200 barrels of oil) of annual direct energy consumption, or approximately 1.4-percent more than the consumption values shown in **Exhibit 3-77**.

Preferred Alternative: Refined Presidio Parkway

The permanent impacts resulting from this impact are the same for Alternative 5, Diamond Option.

All Alternatives (including the No-Build)

Direct energy consumption attributable to transit operations is equal among the four build alternatives. None of the alternatives favor transit over another, and therefore the same level of transit operations in the Doyle Drive corridor was assumed to be among all alternatives in the design year 2030.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and/or mitigation measures discussion focuses on the Preferred Alternative only. The construction costs of the Preferred

Alternative makes it far less energy efficient than the No-Build Alternative. The only means by which energy consumption could be reduced will be through mitigation measures intended to reduce the short-term energy consumption associated with construction activities. Such mitigation measures could include:

- Locate material production facilities on-site or within close proximity to the project site;
- Use newer, more energy efficient construction vehicles; and
- Implement a program to encourage construction workers to carpool or use public transportation for travel to and from the construction site.

3.4 Biological Environment

Botanical and wildlife species in urban landscapes depend on the availability of suitable habitat for survival. Habitat loss and increasing habitat fragmentation are the primary causes of species decline in these environments. This section provides an overview of:

- natural communities;
- wetlands and other waters of the United States;
- plant species;
- animal species; and
- invasive species.

Detailed information about biological resources can be found in the *South Access to the Golden Gate Bridge: Doyle Drive Project Revised Natural Environmental Study* (NES), July 2005. The NES contains an analysis of impacts and specific mitigation measures, as well as *Best Management Practices* (BMPs) and conservation measures for the biological environment. The NES is incorporated in this document by reference, and in all areas where more detail is provided on mitigation measures, the NES commitments are considered part of this document.

The overall mitigation goal identified in the NES is to avoid or minimize construction-related project impacts on biological resources, using generally accepted and practicable mitigation measures through the deployment of BMPs and the designation of Environmentally Sensitive Areas (ESAs)³⁰. Generally, BMPs focus on prevention and containment. This is achieved by controlling the generation of source pollutants and then capturing and containing source pollutants that are generated. For example, application of temporary erosion control materials to unfinished slopes can control a source of sediment deposition. Silt fence can also be deployed to capture sediments that are generated. Deploying both source and sediment control measures provides an efficient and manageable method for addressing erosion. Other examples include: locating equipment and material staging areas in existing disturbed areas within construction limits; limiting fueling and maintenance of equipment to areas not containing sensitive resources (e.g., serpentine plant communities and potential raptor breeding habitat); prohibitions against washing vehicles on site; establishing fueling zones at least 30 meters (100 feet) from wetlands; or as

³⁰ *Environmentally Sensitive Areas (ESAs) are locations of identified at-risk resources that are to be protected by avoidance or by restrictions on Caltrans activities. ESAs typically use fencing, flagging, signing, or monitoring to protect resources from direct physical damage by project activities. The use of the term in this document should not be confused with any discussion of sensitive resources within the construction corridor, for which impacts and mitigation measures are identified. An ESA, by definition, is a site where all impact is avoided. ESAs will be staked and flagged prior to construction and clearly marked on the contract project plans.*

designated by a qualified biologist.³¹ Standard water pollution control procedures such as sandbagging, use of hay bales, diversion ditches, and desilting ponds will also be employed. The project applicant will employ feasible engineering methods during construction to avoid and minimize fugitive dust, erosion and sedimentation, and hazardous materials spills. Refer to the NES for a further description of BMPs for the biological environment. Most of these BMPs are derived from guidelines such as Caltrans' *Storm Water Pollution Prevention Plan*, 2003 (SWPPP), the *Water Pollution Control Program (WPCP) Preparation Manual*, and the *Construction Site Best Management Practices (BMPs) Manual*.

3.4.1 Natural Communities

This section presents a summary of the existing plant communities in the Doyle Drive Project area. The focus is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation is the potential for habitat to be divided, thereby lessening its biological value³².

Regulatory Setting

Federal laws and regulations guide the preservation of the biological environment within the Presidio while state and local requirements provide additional guidance in the surrounding study area. These include The:

- *San Francisco General Plan*; and
- National Park Service (NPS) and Presidio Trust (Trust) Plans and Policies:
 - *Final General Management Plan Amendment (GMPA)*;
 - *Presidio Trust Management Plan (PTMP)*;
 - *Tennessee Hollow Watershed Project Environmental Assessment*;
 - *Natural Resources Section of the Resources Management Plan*;
 - *Presidio Vegetation Management Plan and Environmental Assessment (VMP)*; and
 - *National Park Service (NPS) Management Policies*.

Generally, the NPS and the Trust consider all native plant communities that are biologically intact and diverse as important natural communities (NPS, 1999c). Plant communities on serpentine substrates (i.e., mixed serpentine chaparral, serpentine bunchgrass, and northern coastal bluff scrub) or those communities that are biologically intact and diverse have been identified as Special Ecological Areas by resource managers of the Golden Gate National Recreation Area (GGNRA).

³¹ A "qualified biologist," as the term is used here, means any person who has completed at least four years of university training in wildlife or plant biology or a related science, and/or has demonstrated field experience in the identification and life history of the species potentially present.

³² Biological value as a result of habitat fragmentation is defined as loss of total habitat area and habitat connection, and increased insularity and edge effects.

These plans and policies are discussed in detail in Section 3.2 of this document.

Affected Environment

The project area for biological resources encompasses the Doyle Drive construction corridor (i.e., the footprint and construction limits of the No-Build and the build alternatives) and an area extending 229 meters (750 feet) outside the Doyle Drive construction corridor. The total area of the Doyle Drive construction corridor is 46.66 hectares (115.25 acres).

The majority of the project study area is composed of ornamental landscape (lawn, isolated trees and shrubs), buildings, paved areas, and roadways and total 34.86 hectares (86.14 acres). Many of the plant communities that are in the remainder of the project study area, such as northern coastal bluff scrub, are affected by human activities and natural environmental disturbances (e.g., salt spray, wind, and sun exposure).

The majority of the understory of the non-native introduced forest (understory scrub) and riparian scrub (including central coast arroyo willow scrub and blackberry) within the project study area is highly disturbed, as indicated by the presence of certain invasive plant species (e.g., cape ivy (*Delaria odorata*), English ivy (*Hedera helix*), and cotoneaster (*Cotoneaster* sp.)). Cape ivy is also present, approximately 30 meters (100 feet) north of the construction corridor; wild radish (*Raphanus sativus*), a moderately invasive species, occurs on the northern coastal bluffs.

Many of the plant communities in the Presidio are remnant populations of native communities that were once extensive along the coast of California. Using the Holland (1986) classification system and field observations, 12 wetland and upland plant communities were identified in the project area. They are:

- non-native introduced forest and ornamental wildlife habitat;
- coast live oak woodland;
- riparian scrub (central coast arroyo willow scrub and California blackberry);
- mixed serpentine chaparral;
- non-native grassland;
- native grassland;
- northern coastal scrub (including coastal scrub on sandy soils and on sandy soils with serpentinite inclusions);
- northern coastal bluff scrub;
- northern foredune;
- coastal salt marsh and associated communities; and
- emergent wetland vegetation.

Exhibit 3-78³³ shows the number of hectares (and acres) of each plant community within the project study area and the construction corridor. **Exhibit 3-79**³⁴ illustrates the general location of native vegetation within the Doyle Drive Project study area.

Non-native Introduced Forest and Ornamental Wildlife Habitat

Non-native introduced forest and ornamental wildlife habitat³⁵ covers approximately 32.42 hectares (80.10 acres) within the project study area and approximately 9.95 hectares (24.59 acres) in the construction corridor. The non-native introduced forest is primarily composed of blue gum eucalyptus (*Eucalyptus globulus*), Monterey cypress (*Cupressus macrocarpa*), and Monterey pine (*Pinus radiata*). Monterey cypress and Monterey pine are species native to the Monterey Peninsula of California, but are invasive throughout the rest of California. Blue gum eucalyptus grows rapidly and is native to southeast Australia. Where these species occur within the Historic Forest Management Zone, they are designated as a cultural resource in the NPS's *Vegetation Management Plan*. These species are considered non-native invasive species within the Native Plant Zone of the *Vegetation Management Plan*. This report collectively refers to these trees as non-native introduced forest. Non-native introduced forest provides wildlife habitat.

Coast Live Oak Woodland

Coast live oak woodland occurs in moist sites in the project study area and totals approximately 0.98 hectare (2.43 acre). This vegetation type is not present within the construction corridor. Coast live oak (*Quercus agrifolia*) is the dominant species in this plant community, and associated species include poison oak (*Toxicodendron diversilobum*), toyon (*Heteromeles arbutifolia*), and California coffeeberry (*Rhamnus californica*).

³³ 'Coastal salt marsh and associated communities' include 'Central dune scrub and 'Coastal salt marsh' and are depicted on Exhibit 3-79 separately.

³⁴ Note that some vegetation types were combined for illustration purposes. 'Northern coastal scrub' and 'Understory coastal scrub' can include 'Northern coastal scrub on sandy soils' and 'Northern coastal scrub on sandy soils with serpentinite inclusions' depending on its location (see Exhibit 3-81). 'Central coast arroyo willow scrub' also includes California blackberry. Non-native grassland is not shown because it is too small to map. Wetland vegetation communities are included for display purposes only on Exhibit 3-79. Refer to Exhibit 3-82 for an illustration of all wetlands.

³⁵ The term 'Ornamental wildlife habitat' is used to define landscape vegetation that can provide habitat for wildlife species.

Exhibit 3-78
Existing Plant Communities in Project Study Area and Doyle Drive Construction Corridor

PLANT COMMUNITY	NUMBER OF HECTARES (ACRES) IN PROJECT STUDY AREA	NUMBER OF HECTARES (ACRES) IN DOYLE DRIVE CONSTRUCTION CORRIDOR
Non-native Introduced Forest and Ornamental Wildlife Habitat	32.42 (80.10)	9.95 (24.59)
Coast Live Oak Woodland	0.98 (2.43)	None
Riparian Scrub (arroyo willow and blackberry)	1.16 (2.88)	0.71 (1.76)
Mixed Serpentine Chaparral	0.42 (1.06)	None
Non-native Grassland	0.05 (0.13)	0.05 (0.13)
Northern Coastal Scrub on sandy soils	6.63 (16.36)	0.30 (0.73)
Northern Coastal Scrub on sandy soils and with serpentinite inclusions	Included with northern coastal scrub totals above	0.71 (1.76)
Native Grassland	0.65 (1.62)	None
Northern Coastal Bluff Scrub	1.21 (3.00)	None
Northern Foredune	1.04 (2.58)	None
Coastal Salt Marsh and Associated Communities	Approximately 6 (15)	None
Emergent Wetland	0.26 (0.63)	0.06 (0.15)
TOTAL AREA	48.75 (120.67)	11.60 (28.67)

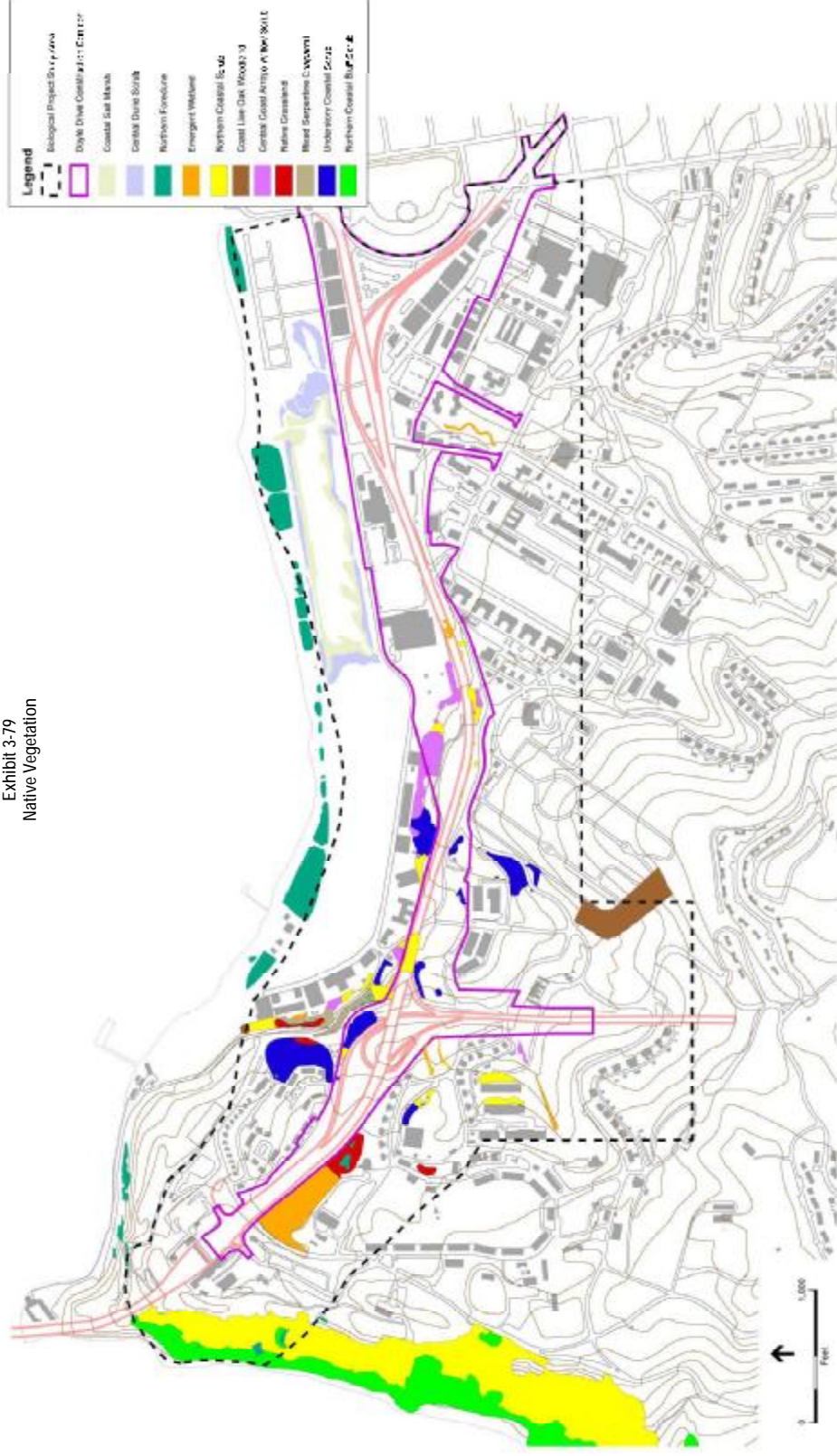
Source: Environmental Science Associates, 2005.

Areas of plant communities were calculated using ArcGIS 9.0. Area of Doyle Drive Construction Corridor is 46.66 hectares (115.25 acres). Non-habitat areas comprised of ornamental landscape areas (lawn, isolated trees and shrubs), buildings, paved areas, and roadways total 34.86 hectares (86.14 acres). Thompson Reach is not included in the total of Emergent Wetland. Areas not accounted for in the Exhibit above are wetlands described in Exhibit 3-83.

Riparian Scrub (including Central Coast Arroyo Willow Scrub and California blackberry)

Riparian scrub covers 1.16 hectares (2.88 acres) and occurs on hillside slopes with perennial, or at least intermittent, water flows in three areas of the project study area. A total of 0.71 hectare (1.76 acres) of riparian scrub is present in the construction corridor. Arroyo willow (*Salix lasiolepis*) is the primary species in riparian scrub. A few blue elderberry (*Sambucus mexicana*) and red elderberry (*S. racemosa*) are present in central coast arroyo willow scrub. California blackberry (*Rubus ursinus*) intermixes with arroyo willow in one area of the Presidio. The NPS and the Presidio Trust consider riparian scrub an important plant community; little of this community remains in the Presidio.

Exhibit 3-79
Native Vegetation



Source: Environmental Science Associates, 2004; Parsons Brinckerhoff, 2004; National Park Service, 2001; 2005.

Mixed Serpentine Chaparral

Mixed serpentine chaparral covers 0.42 hectare (1.06 acres) within the project study area but does not occur in the construction corridor. This community occurs on shallow serpentine soils, which are unique geological soils naturally deficient in certain plant nutrients; only plants specially adapted to or tolerant of these chemically unique soils tend to grow and persist. The NPS and the Trust consider mixed serpentine chaparral an important plant community because it is limited within the Presidio and it frequently supports several special-status plant species.

In the project study area, mixed serpentine chaparral is made up of primarily coyote brush (*Baccharis pilularis*), toyon, and blue blossom ceanothus (*Ceanothus thyrsiflorus*).

Mixed serpentine chaparral on the coastal bluffs supports the following special-status plant species, which are classified by the California Native Plant Society (CNPS) as having limited distribution (List 4): coast rock cress (*Arabis blepharophylla*), a federal species of local concern; Franciscan thistle (*Cirsium andrewsii*), a federal species of special concern; and San Francisco wallflower (*Erysium franciscanum*) a federal species of special concern.

San Francisco gumplant (*Grindelia hirsutula var. maritima*), a federal species of special concern, and a species classified as rare, threatened, or endangered in California and elsewhere by the CNPS, occurs in two locations north of the construction corridor.

Non-native Grassland

A small area of non-native grassland, 0.05 hectare (0.13 acre), is present within the project study area and entirely within the construction corridor. These grasses include annuals such as bromes (*Bromus* spp.), wild oats (*Avena fatua*), and ruderal vegetation.

Northern Coastal Scrub

Northern coastal scrub occurs on sandy soil as well as sandy soil with serpentinite inclusions. Soils with serpentinite inclusions are soils with small, localized spots containing chemically unique serpentine soils.

Northern coastal scrub, including coastal scrub in the understory of trees totals 6.63 hectares (16.36 acres) within the project study area. Dominant species of northern coastal scrub that were observed in the project study area included coyote brush and yellow bush lupine (*Lupinus arboreus*).

In the construction corridor, northern coastal scrub comprises 1.01 hectares (2.49 acres). Northern coastal scrub in the construction corridor is an open community with sparsely distributed plants, and it has low plant species diversity. Understory scrub within the construction corridor is primarily composed of non-native species, including cotoneaster, black acacia, blue gum eucalyptus, English ivy, and non-native annual grasses. A very small area (less than 0.1 hectare [0.25 acre]) of understory scrub is located on the north-facing slope of the Park Presidio Interchange and is composed of native species, including poison oak, monkey flower (*Mimulus aurantiacus*) and stinging nettle (*Urtica dioica*). The sandy soil in this area has serpentinite inclusions.

Northern coastal scrub is a common plant community in northern California and is not typically considered sensitive by the California Department of Fish and Game (CDFG) or by the NPS. It is an important plant community and is considered locally rare by the NPS and the Trust.

Northern Coastal Bluff Scrub

The dominant species that compose northern coastal bluff scrub are similar to those in northern coastal scrub. The main difference between these two communities is that northern coastal bluff scrub occurs on steeper slopes and is exposed to harsher environmental conditions (e.g., salt spray, wind, and sun exposure) than northern coastal scrub. Northern coastal bluff scrub comprises about 1.21 hectares (three acres) and occurs on the western perimeter of the project study area. It does not occur in the construction corridor.

Native Grassland

Native grassland consists of native species on serpentine and non-serpentine areas and totals 0.65 hectare (1.62 acres). Serpentine bunchgrass grassland totals approximately 0.19 hectare (0.47 acre) in the study area and primarily consists of herbaceous perennial bunchgrasses. Serpentine bunchgrass grassland occurs approximately 91 meters (300 feet) north of the construction corridor, but not in the construction corridor. This grassland type, occurring on chemically unique serpentinite soils, is primarily composed of purple needlegrass (*Nassella pulchra*), California oatgrass (*Danthonia californica*), and foothill needlegrass (*Nassella lepida*). Non-serpentine grassland consists of similar species as serpentine bunchgrass and occurs south of the Doyle Drive construction corridor. Non-serpentine native grassland totals 0.46 hectare (1.15 acres). The NPS and the Trust consider serpentine native grassland a sensitive plant community.

Northern Foredune

The northern foredune community comprises 1.04 hectares (2.58 acres) of the project study area. It occurs at Crissy Marsh, north of the construction corridor, but does not occur within the construction corridor.

Northern foredune is subject to harsh environmental conditions resulting in an open community with sparsely distributed low-growing herbs and subshrubs. Dominant species in this community include sand-verbena (*Abronia* spp.), beach

primrose (*Camissonia cheiranthifolia*), silvery beachweed (*Ambrosia chamissonis*), and coastal sagewort (*Artemisia pycnocephala*). The NPS and the Trust consider northern foredune an important plant community and is identified as a Special Ecological Area (SEA) by NPS.

Coastal Salt Marsh and Associated Communities

Coastal salt marsh was restored as part of the larger 40.5 hectare (100 acres) Crissy Field Restoration Project. Within the project study area, the dominant salt marsh species include Pacific cordgrass (*Spartina foliosa*), pickleweed (*Salicornia* sp.), salt grass (*Distichlis spicata*), alkali heath (*Frankenia salina*), san-spurrey (*Spergularia* sp.), fleshy jaumea (*Jaumea carnosa*), and marsh rosemary (*Limonium californicum*). Northern foredune, central dune scrub (2.82 hectares [6.98 acres]), and freshwater wetland communities are also present in the approximately six hectare (15 acre) Crissy Marsh area. These communities occur outside of the construction corridor. Both the NPS and the Trust consider communities in the Crissy Marsh important, and the Crissy Field dune community is identified as a Special Ecological Area (SEA) by the NPS.

Emergent Wetland

Emergent wetland includes plant species found in seasonal wetlands and perennial streams. Plant species observed in the emergent wetlands may include water bentgrass (*Agrostis semiverticillata*), watercress (*Rorippa nasturtium-aquaticum*), calla lily (*Zantedeschia aethiopica*), wild celery (*Apium graveolens*) and horsetail (*Equisetum* sp.). Emergent wetland vegetation occurs at W-3, Battery Howe-Wagner, portions of Dragonfly Creek, and North Fort Scott, and totals 0.26 hectare (0.63 acre) in the project study area and 0.06 hectare (0.15 acre) in the construction corridor. Thompson Reach also supports emergent wetland vegetation within the project study area. Emergent wetland vegetation is accounted for in Section 3.4.2 Wetlands and Other Waters of the United States.

Temporary Impacts

Temporary, direct, construction-related effects under the build alternatives would include trampling in the construction corridor areas resulting in minor effects on vegetation. Trampling effects could result in erosion, community fragmentation, soil and root compaction, and plant mortality at localized areas.

This section discusses temporary impacts to the natural communities.

Non-Native Vegetation

All of the build alternatives would require grading and removal of a similar amount of vegetation. Temporary, and direct, construction-related effects under the build alternatives would include trampling in the construction corridor areas. Trampling could lead to erosion, community fragmentation, soil and root compaction, and plant mortality at localized areas. Trampling can also create favorable conditions for invasive non-native plant species, such as bull thistle (*Cirsium vulgare*), and non-native annual species to be introduced or spread into

the area. Invasive plant species can form monocultures and displace native plant species, and as a result, adversely modify species composition and diversity. Temporary construction impacts would be addressed by implementing a revegetation plan in areas disturbed during construction. Revegetating would minimize erosion and the establishment of invasive non-native species.

All build alternatives will involve demolition, excavation and grading during the dry season that would cause dust. If left uncontrolled, dust could temporarily cover the leaves of plants in a localized area and reduce light and gas exchange. Effects on common vegetation caused by dust emissions during the dry season will be locally adverse, but minor.

Important Plant Communities

The build alternatives will result in direct temporary impacts on important upland plant communities. For northern coastal scrub on sandy soils, the area of impact varies from 0.01 hectare (0.02 acre) for the Presidio Parkway Alternative and the Preferred Alternative, to 0.04 hectare (0.11 acre) for the Alternative 2, Detour Option. A slightly larger area, 0.06 hectare (0.16 acre) of northern coastal scrub on sandy soil with serpentinite inclusions would be disturbed by the Alternative 2, With Detour and No-Detour Options. With the Presidio Parkway Alternative, this area of impact is 0.17 hectare (0.43 acre) for the Diamond, Circle and Loop Options and 0.35 hectare (0.87 acre) for the Diamond, Circle and Hook Options. The same area would be disturbed whether or not the Merchant Road Slip Ramp is included. With the Preferred Alternative, the area of impact will be 0.35 hectare (0.87 acre). These communities will be revegetated in place to the extent feasible or restored elsewhere within the construction corridor.

The build alternatives may also result in temporary indirect impacts such as soil runoff during the rainy season, dust (particularly during the dry season), and trampling. Important plant communities north of Lincoln Boulevard may be indirectly affected by soil runoff in the rainy season during excavation and grading for the high-viaduct at the Park Presidio Interchange, which will occur with all build alternatives. Construction of the Merchant Road Slip Ramp Option with the Presidio Parkway Alternative would also indirectly affect these plant communities. Implementing measures such as soil stabilization controls and silt fencing during construction would avoid these indirect effects on plant species of concern.

Dust could temporarily cover the leaves, thereby reducing the exchange of light and gas of plants within important plant communities north of the construction corridor and within the project study area. These communities are coastal salt marsh, central dune scrub, freshwater wetland, native grassland, mixed serpentine chaparral, central coast arroyo willow scrub, northern coastal scrub (on sandy soil and sandy soil with serpentine inclusions), and northern foredune. The effects of dust would be minor because Bay Area Air Quality Management District's

(BAAQMD) basic dust control procedures and measures in *Caltrans Special Provisions* would be implemented as part of the project.

Exhibit 3-80 shows the direct temporary impacts to each plant community by alternative.

Exhibit 3-80
Direct Temporary Impacts to Plant Communities other than Wetlands

	NON-NATIVE INTRODUCED FOREST AND ORNAMENTAL WILDLIFE HABITAT (HECTARES / ACRES)	NORTHERN COASTAL SCRUB ON SANDY SOIL (HECTARES / ACRES)	NORTHERN COASTAL SCRUB WITH SERPENTINE INCLUSIONS (HECTARES / ACRES)	NON-NATIVE GRASSLAND (HECTARES / ACRES)
Number of Hectares (acres) in Doyle Drive Construction Corridor	9.95 / 24.59	0.30 / 0.73	0.71 / 1.76	0.05 / 0.13
ALTERNATIVE	IMPACT AREA			
Alternative 2: Detour Option	0.67 / 1.65	0.04 / 0.11	0.06 / 0.16	None
Alternative 2: No-Detour Option	0.59 / 1.45	0.02 / 0.06	0.06 / 0.16	None
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options and the Loop Ramp Option	1.18 / 2.91	0.01 / 0.02	0.17 / 0.43	None
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options, the Loop Ramp Option, and a Merchant Road Slip Ramp	1.18 / 2.91	0.01 / 0.02	0.17 / 0.43	None
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options and the Hook Ramp Option	1.22 / 3.02	0.01 / 0.02	0.35 / 0.87	None
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options, the Hook Ramp Option, and a Merchant Road Slip Ramp	1.22 / 3.02	0.01 / 0.02	0.35 / 0.87	None
Preferred Alternative: Refined Presidio Parkway	1.22 / 3.02	0.01 / 0.02	0.35 / 0.87	None

Permanent Impacts

Permanent impacts to plant communities are anticipated for all build alternatives.

Common Vegetation

If not controlled, demolition, excavation and grading during the rainy season for all build alternatives may cause sedimentation problems that will affect adjacent vegetation. However, by adhering to a *Stormwater Pollution Prevention Plan* (SWPPP) and *Best Management Practices* (BMPs), which are identified at the beginning of this section and further described in the NES, the proposed project would cause only minor effects to common vegetation.

Under Alternative 2, With Detour and No-Detour Options, non-native grasslands would not be permanently affected. However, constructing Alternative 2, With Detour Option would result in a loss of 2.37 hectares (5.86 acres) of non-native introduced forest and ornamental wildlife habitat. Constructing Alternative 2, No-Detour Option would result in the loss of 2.57 hectares (6.35 acres) of non-native introduced forest and ornamental wildlife habitat.

Alternative 5, Diamond or Circle with Loop Options would result in the permanent loss of 4.54 hectares (11.23 acres) of non-native introduced forest and ornamental wildlife habitat and grasslands. The Diamond or Circle with Hook Options would result in the loss of 4.61 hectares (11.39 acres) of non-native vegetation.

An additional 0.47 hectare (1.15 acres) of non-native introduced forest and ornamental wildlife habitat would be removed if the Merchant Road Slip Ramp Option is included.

The Preferred Alternative will result in the permanent loss of 4.62 hectares (11.42 acres) of non-native introduced forest and ornamental wildlife habitat and grasslands.

Permanent effects on common non-native vegetation are considered minor. The eastern portion of all build alternatives on Richardson Avenue between Francisco and Lyon Streets will support existing street trees. The street trees along Richardson Avenue will not be affected by the haul route proposed for all build alternatives because they are located away from the road.

Important Plant Communities

Construction of all build alternatives will result in localized permanent effects to northern coastal scrub on sandy soils and northern coastal scrub on sandy soils with serpentine inclusions. The construction corridor does not contain areas designated as Special Ecological Areas by the NPS.

All of the build alternatives will remove, damage or alter northern coastal scrub on sandy soil and northern coastal scrub on sandy soil with serpentine inclusions.

Northern coastal scrub on sandy soil.

Alternative 2, With Detour Option would disturb 0.16 hectare (0.40 acre) of northern coastal scrub on sandy soil. Alternative 2, No-Detour Option would disturb 0.17 hectare (0.43 acre) of this plant community, and each Presidio Parkway Alternative would disturb 0.20 hectare (0.50 acre). The Preferred Alternative will disturb 0.21 hectare (0.53 acre) of this plant community.

Northern coastal scrub on sandy soil with serpentine inclusions

Alternative 2, With Detour Option and Alternative 2, No-Detour Option would each disturb an area of 0.20 hectare (0.50 acre) of northern coastal scrub on sandy soil with serpentine inclusions. The Presidio Parkway Alternative would disturb between 0.20 hectare (0.49 acre) and 0.37 hectare (0.91 acre) of this plant community, depending upon the Presidio Parkway Alternative Option. If the Merchant Road Slip Ramp is built, the area of disturbance would increase by 0.10 hectare (0.44 acre). The Preferred Alternative will disturb 0.21 hectare (0.53 acre) of this plant community.

Permanent impacts on important plant communities caused by the build alternatives will conflict with the NPS' natural resource management policies and the Trust's objectives stated in the VMP and the PTMP, and will be considered adverse.

The Presidio Parkway Alternatives and the Preferred Alternative will allow the area above the Main Post and Battery Tunnels to be revegetated with native plants. The Presidio Parkway and Preferred Alternatives' Main Post Tunnels will constrain rooting depths and limit the volume of soil to between 1 and 2 meters (3 to 6 feet) along a two percent west to east gradient. The Battery tunnels will allow up to five meters (16 feet) of soil depth. Despite these limitations, a 1 to 1.5 meter (3 to 5 feet) depth is considered sufficient to provide a substrate volume for rooting the shrubby coastal and scrub species. Refer to Hydrology, Water Quality and Storm Water, Section 3.3.1 for a further discussion of hydrologic issues associated with the proposed tunnels.

In areas above the tunnels where the volume of soil is greater, perennial herbaceous species, such as California brome (*Bromus carinatus*) and purple needlegrass could establish. The area above the eastern ends of the tunnels would provide the greatest rooting depth below the surface grade, and a variety of annual and perennial species could establish in this area. Additionally, woody shrubs, such as coyote brush and coffeeberry, could be planted at the eastern end of the tunnels.

Exhibit 3-81 shows the permanent impacts to each plant community by alternative.

Exhibit 3-81
Direct Permanent Impacts to Plant Communities other than Wetlands

	NON-NATIVE INTRODUCED FOREST AND ORNAMENTAL WILDLIFE HABITAT (HECTARES / ACRES)	NORTHERN COASTAL SCRUB ON SANDY SOIL (HECTARES / ACRES)	NORTHERN COASTAL SCRUB WITH SERPENTINE INCLUSIONS (HECTARES / ACRES)	NON-NATIVE GRASSLAND (HECTARES / ACRES)
Total Number of Hectares (acres) in Doyle Drive Construction Corridor	9.95 / 24.59	0.30 / 0.73	0.71 / 1.76	0.05 / 0.13
ALTERNATIVE	IMPACT AREA			
Alternative 2: Detour Option	2.37 / 5.86	0.16 / 0.40	0.20 / 0.50	None
Alternative 2: No-Detour Option	2.57 / 6.35	0.17 / 0.43	0.20 / 0.50	None
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options and the Loop Ramp Option	4.54 / 11.23	0.20 / 0.50	0.27 / 0.67	0.02 / 0.04
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options, the Loop Ramp Option, and a Merchant Road Slip Ramp	5.01 / 12.38	0.20 / 0.50	0.37 / 0.91	0.02 / 0.04
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options and the Hook Ramp Option	4.61 / 11.39	0.20 / 0.50	0.20 / 0.49	0.01 / 0.03
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options, the Hook Ramp Option, and a Merchant Road Slip Ramp	5.08 / 12.54	0.20 / 0.50	0.30 / 0.73	0.01 / 0.03
Preferred Alternative: Refined Presidio Parkway	4.61 / 11.39	0.21 / 0.53	0.21 / 0.53	0.01 / 0.03

Avoidance, Minimization, and/or Mitigation Measures

The overall mitigation goal is to avoid and minimize temporary construction-related impacts and long-term project impacts to natural communities. The following presents a discussion of avoidance, minimization, and mitigation measures for the Preferred Alternative.

Implement a Plan for Revegetation of Temporarily Disturbed Vegetation

Mitigation measures for upland natural communities are described below in Section 3.4.3, Plant Species. Mitigation measures for wetland natural communities are described below in Section 3.4.2, Wetlands and Other Waters of the United States.

Implement a General Biological Resource Monitoring Program³⁷

The Doyle Drive Monitoring Program for Biological Resources (Monitoring Program) described in this section is designed to ensure that biological monitoring is effectively administered and results in the avoidance and minimization of adverse effects on sensitive resources. It also provides that in cases where standards are not met, the appropriate parties are notified to take corrective action and implement adaptive management. Refer to the NES for further information on the Doyle Drive Monitoring Program for Biological Resources.

Biological Contractor Compliance Manager

The Biological Contractor Compliance Manager (Contractor) will oversee all aspects of the Monitoring Program that need to be implemented by persons working in the field. This person will interact directly with the Biological Monitor to notify the Resident Engineer when an activity is causing concerns, when an activity should be stopped, or when an activity should be modified.

Construction Project Manager

The Construction Project Manager will be responsible for all aspects of the Monitoring Program requiring senior management review. The project manager will receive monitoring reports, forward those reports to resource agencies when appropriate, and make decisions on Doyle Drive Project modifications.

Resident Engineer

The Resident Engineer is the focal point for contact with the Contractor. The biological monitoring staff will direct all construction-related concerns to the Resident Engineer.

Biological Monitors

The Biological Monitors will be qualified biologists who meet a set of established professional criteria. In addition to being able to identify wetlands, special-status plant and wildlife species, general plants and wildlife, woodrat nests, and bird nests, the Biological Monitor functions as a facilitator and record keeper. The Biological Monitors need to be present during construction for Environmentally Sensitive Area (ESA) fence installation, clearing and grubbing, and the initial grading.

Should the contractor's workers encounter wetlands, special-status plant and wildlife species, nesting birds, or any other important biological resource noted in the NES, the contractor will notify the Biological Monitor and, if necessary, stop

³⁷ A Biological Resource Team, comprised of members of all of the responsible agencies involved, will agree to and approve the details of the Biological Resource Monitoring Program, including the Special-status Bird Avoidance/Mitigation Plan (see Section 3.4.4).

work until the Biological Monitor has addressed the issue involving the biological resource. Biological Monitors will be responsible for the following:

- completing surveys where required (i.e., assessing if nesting birds and roosting bats are present);
- monitoring construction activities, active construction zones and Crissy Marsh;
- completing daily biological monitoring reports for each day spent monitoring construction;
- monitoring biological resources as needed;
- recording compliance with the measures described in this section; and
- helping administer the environmental training sessions to construction personnel.

The specific tasks and procedures associated with biological monitoring will be detailed in the project's special provisions.

Training

Training for project staff and other staff involved with the Doyle Drive Project will include a Pre-Construction training session for all construction workers. This session will:

- describe the construction sequence and key safety concerns;
- present information provided by the Trust and NPS on working with these agencies and within national parks, such as picking up all trash and not feeding wildlife;
- provide insights into effective monitoring and inspection;
- establish a common understanding of the Monitoring Program; and
- establish communication procedures.

A project environmental kick-off meeting for all management-level project staff will be held.

3.4.2 Wetlands and other Waters of the United States

Wetlands are unique, natural areas that occur wherever land is inundated, covered, or influenced by the presence of water. Wetlands support the growth of water-loving and water-tolerant vegetation.

At times of flooding, wetlands at the mouths of streams and rivers receive overflow water that is rich in nutrients and sediments. Such wetlands provide floodwater storage and attenuation functions, which allow sediments to settle and clearer water to percolate into the groundwater. Thus, wetlands play an essential role in filtering nutrients and sediments out of water before it enters lakes and bays. By storing and slowly releasing flood water, wetlands also moderate the damage that flooding can cause. Wetlands are located throughout stream and river systems, providing nutrient and sediment traps and flood

control all along the way. Wetlands support high wildlife diversity as well as provide a water source for species associated with upland habitats.

This section discusses water bodies (e.g., wetlands, streams, marshes) in the project study area and the construction corridor and describes the potential effect of the build alternatives on those water bodies. Water-associated features in the study area include:

- Waters of the United States, which include wetlands and other special aquatic sites that are subject to U.S. Army Corps of Engineers (USACE) jurisdiction under *Section 404* of the *Clean Water Act* and *Executive Order 11990*;
- U.S. Fish and Wildlife Service (USFWS) wetlands according to the Cowardin classification system (Cowardin et al. 1979) that are protected, along with waters of the United States, by the National Park Service (NPS) and the Presidio Trust under *Executive Order 11990*, *Presidio Trust Management Plan* (PTMP) and National Park Service Management Policies; and
- Future wetlands that are planned to exist within the Doyle Drive corridor (e.g., the Tennessee Hollow restoration project and the Crissy Field restoration expansion project) as discussed in the *General Management Plan Amendment* (GMPA) and the *Presidio Trust Management Plan*.

Regulatory Setting

Wetlands and non-wetland water resources (e.g., rivers, streams, and natural ponds) are a subset of waters of the United States. Because of the importance of wetlands within the biological environment, the following laws and regulations govern their preservation.

Federal Laws and Regulations

Clean Water Act, Section 404

The *Clean Water Act* (33 U.S.C. 1344) (CWA) is the primary law regulating waters of the United States. CWA *Section 404* regulates the discharge of dredged or fill material into waters of the United States. The USACE has primary federal responsibility for administering regulations that concern waters of the United States and wetlands within project sites.

Executive Order 11990

Executive Order for the Protection of Wetlands (11990) was issued “to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative....”

Executive Order 11990 directs federal agencies to:

- 1) provide leadership and to take action to minimize the destruction, loss, or degradation of wetlands;
- 2) preserve and enhance the natural and beneficial value of wetlands; and

- 3) avoid direct or indirect support of new construction in wetlands unless there are no practicable measures to minimize harm to wetlands.

State Regulations

San Francisco Bay Regional Water Quality Control Board

The San Francisco Regional Water Quality Control Board (SFRWQCB), North Coast Region, regulates waters of the State under the *Porter-Cologne Act*. Under *Section 401* of the CWA, the RWQCB has review authority of *Section 404* permits. The RWQCB has a policy of no-net-loss of wetlands in effect and typically requires mitigation for all impacts to wetlands before it would issue a water quality certification. Dredging, filling, or excavating isolated waters constitutes a discharge of waste to waters of the State, and prospective dischargers are required to submit a report of waste discharge to the RWQCB and comply with other requirements of the *Porter-Cologne Act*.

San Francisco Bay Conservation and Development Commission

The *Coastal Zone Management Act* (CZMA), Section 307 mandates that federal agency activities be “consistent to the maximum extent practicable with the enforceable policies of approved state management programs” and that this consistency be documented and coordinated with the state. A federal agency ensures consistency of its proposed actions with state management programs by submitting a consistency determination to the relevant state agency. After receipt of the consistency determination, the state agency informs the federal agency of its concurrence with, or objection to, the federal agency’s consistency determination.

The San Francisco Bay Conservation and Development Commission (BCDC) is the state agency charged with administering the federal CZMA within the San Francisco Bay segment of the California coastal zone. Within the Commission’s areas of concern, the coastal zone consists of all areas located within the Commission’s jurisdiction except those lands that the federal government owns, leases, holds in trust, or over which the federal government has sole discretion. While by definition all Presidio lands are outside the coastal zone, any federal activity (regardless of location) that affects any natural resources, land uses, or water uses in the coastal zone will be subject to the consistency requirement. The Federal Highway Administration will ensure that its obligations under the CZMA are met through the appropriate federal consistency determination process outlined in the *Coastal Zone Management Act (CZMA) Federal Consistency Regulations*, 71 Federal Regulation 787-831 (Jan. 5, 2006) at 15 CFR 930.

It is the intent of the lead agencies to comply with and conduct the Doyle Drive Project in a manner which is consistent with the *Bay Plan* to the maximum extent practicable. Based on the information developed through this EIS/R process, the Preferred Alternative, if implemented, will be consistent with the BCDC’s coastal management program. The Commission may review this consistency determination and either concur or object.

Affected Environment

The Presidio has a variety of wetland types. The following discusses these wetlands.

U.S. Army Corps of Engineers Jurisdictional Waters of the United States

Thirteen soil pits were examined and 13 water-associated features were delineated on July 25, 2000, and November 28, 2000, within and adjacent to the Doyle Drive construction corridor. Other water-associated features in the project study area that were delineated include North Fort Scott, Battery Howe-Wagner, Dragonfly Creek, and Lower Dragonfly Creek, which is a subset of Dragonfly Creek. All of these features were incorporated into a wetland delineation that was verified by the USACE on August 29, 2001.

On August 29, 2001, the USACE also verified that seven of the water-associated features are jurisdictional waters of the U.S. under *Section 404* of the CWA. These are identified in **Exhibits 3-82³⁸** and **3-83** (on the following pages) as W-2, W-3, W-8, W-8b, Battery Howe-Wagner, Lower Dragonfly Creek, and Tennessee Hollow. The 2001 wetland delineation was updated in 2007 and is awaiting verification by the USACE. The following analysis incorporates the 2007 wetland delineation data. It is anticipated that a *Nationwide Permit #14* will be required for this project.

- North Fort Scott and Crissy Marsh (W-1) were identified during the 2001 wetland delineation as jurisdictional waters of the U.S. in the project study area. The USACE determined that the remaining water-associated features within the construction corridor were non-jurisdictional. Jurisdictional waters of the U.S. identified in the project study area total 6.82 hectares (16.87 acres), of which 0.17 hectare (0.43 acre) are within the construction corridor.

NPS- and Trust-Protected Cowardin Wetlands

The NPS and Trust define wetlands using the Cowardin classification system, which defines a wetland as having at least one or more of the following attributes:

- at least periodically, the land supports predominantly hydrophytes (wetland vegetation);
- the substrate is predominantly undrained hydric soil; or
- the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

The Cowardin wetlands located in the project study area total one hectare (2.47 acres) and are protected by the NPS or the Trust as palustrine scrub-shrub. Because the NPS and the Trust also protect USACE wetlands, the total number

³⁸ As a mapping convention, polygons on Exhibit 3-82 are marked differently for Cowardin wetlands and Corps jurisdictional waters. However, the Cowardin system includes all Corps waters as well.

of wetlands protected by the NPS and the Trust is 8.04 hectares (19.86 acres) within the project study area.

Excluding USACE jurisdictional wetlands, NPS or the Trust protect a total of 0.49 hectare (1.21 acres) of Cowardin wetlands within the construction corridor; these are W-4, W-5, W-6a, W-6b, and W-6c. These wetlands are not within the USACE jurisdiction under *Section 404* of the *Clean Water Act* as waters of the United States. The dominant species in these wetlands consist of arroyo willow and California blackberry, referred to collectively as riparian scrub. The riparian scrub Cowardin wetlands also support Algerian ivy (*Hedera helix*) and cape ivy, which are non-native, invasive species. The California Exotic Pest Plant Council includes them in the group of the “most invasive and damaging wildland pest plants species.”

In a regional context, most of the Cowardin wetlands and USACE jurisdictional wetlands, with the exception of the restored wetlands at Crissy Field, have low to moderate value as aquatic resources because they have low species diversity and lack canopy structure suitable for most breeding wildlife species. However, relative to the surrounding urban environment, these wetlands may be considered by the NPS and the Trust as high value because they may serve an aesthetic function in a recreational park, are the only water-associated features with well-established plants in the northern portion of the Presidio, and may provide habitat for common and special-status wildlife species.

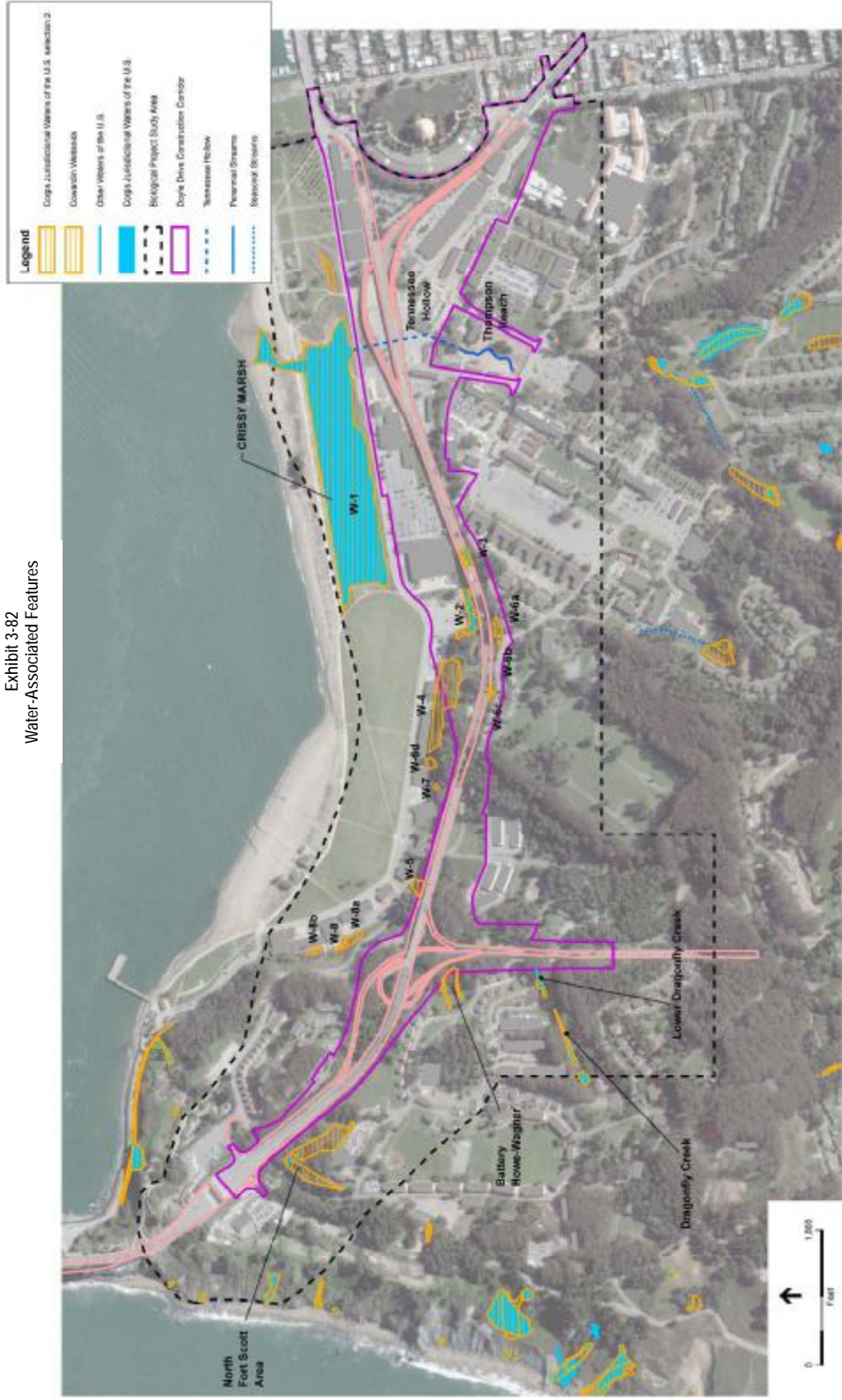
The Cowardin definition, therefore, includes more habitat types than the definition (33 CFR 328.3) and delineation manual used by the USACE. The 1987 Corps of Engineers *Wetlands Delineation Manual* requires that all three of the parameters listed above (hydrophytic vegetation, hydric soil, wetland hydrology) be present for a habitat to be considered a wetland. The Cowardin wetland definition includes wetlands, but also adds some habitats that, though lacking vegetation or soils, are still saturated or shallow inundated environments that support aquatic life.

Each Cowardin wetland protected by the NPS or the Trust located within the project study area is discussed in the following sections.

Arroyo Willow Scrub and Associated Wetlands

Cowardin arroyo willow scrub is found along the steep hillside slopes north of Doyle Drive at wetlands W-4, W-5, W-7 and W-8a. Currently, wetlands W-4, W-5, W-7 and W-8a receive stormwater runoff from the Doyle Drive roadway above them and water seepage through fractures. **Exhibit 3-83** provides more information on these wetlands.

Exhibit 3-82
Water-Associated Features



Source: Environmental Science Associates, 2007; Parsons Brinckerhoff, 2004; National Park Service, 2007.

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Exhibit 3-83
 Summary of USACE Jurisdictional Waters of the U.S.
 and NPS/Trust Cowardin Wetlands in the Project Study Area

MAP SYMBOL	TYPE	JURISDICTIONAL WATERS OF THE U.S. IN PROJECT STUDY AREA		JURISDICTIONAL WATERS OF THE U.S. IN DOYLE DRIVE CONSTRUCTION CORRIDOR	
		HECTARES	ACRES	HECTARES	ACRES
USACE JURISDICTIONAL WATERS OF THE U.S.					
W-1	Restored tidal marsh (Crissy Marsh) and associated wetlands	6.56	16.20	0	0
W-2	Arroyo willow scrub	0.07	0.18	0.07	0.18
W-3	Seasonal wetland	0.06	0.15	0.06	0.15
W-8	Freshwater wetland	0.01	0.03	0	0
Lower Dragonfly Creek	Perennial stream with freshwater wetland	0.01	0.01	0	0
North Fort Scott	Freshwater wetland	0.02	0.06	0	0
Battery Howe-Wagner	Perennial stream with seasonal wetland	0.06	0.16	0.01	0.02
Tennessee Hollow (in construction corridor)	Seasonal stream (underground)	0.03	0.08	0.03	0.08
TOTAL		6.82	16.87	0.17	0.43
COWARDIN WETLANDS UNDER THE PROTECTION OF THE NPS OR THE TRUST EXCLUDING USACE WETLANDS					
W-2	Arroyo willow scrub	0.12	0.30	0.12	0.30
W-4	Arroyo willow scrub	0.71	1.74	0.40	1.00
W-5	Arroyo willow scrub	0.06	0.16	0.01	0.02
W-6a	California blackberry wetland	0.05	0.12	0.05	0.12
W-6b	California blackberry wetland	0.01	0.02	0.01	0.02
W-6c	California blackberry wetland	0.02	0.05 (0.04 + .01)	0.02	0.05
W-6d	California blackberry wetland	0.04	0.11	0	0
W-7	Arroyo willow scrub	0.004	0.01	0	0
W-8b	Seasonal wetland	0.03	0.07	0	0
W-8a	Arroyo willow scrub	0.08	0.19	0	0
TOTAL		1.12	2.77	0.49	1.21

Source: Environmental Science Associates, NPS, Trust, 2001.

These four wetlands cover a total of 0.85 hectare (2.10 acres) in the project study area. The dominant vegetation consists of arroyo willow in all of these locations; however, California blackberry is a co-dominant species in wetland W-4. Wetlands W-4, W-5, W-7 and W-8a are not within the USACE jurisdiction under *Section 404* of the *Clean Water Act* as wetland waters of the United States because they do not meet the soil criterion. However, they would be classified as palustrine scrub-shrub using the Cowardin system.

California Blackberry and Associated Wetlands

California blackberry is found along the gentle hillside slopes between Doyle Drive and Lincoln Boulevard at wetlands W-6a, W-6b, W-6c, W-6d, covering a total of 0.12 hectare (0.30 acre) in the project study area. These hillside slopes supported northern coastal scrub (Jones and Stokes, 1997) prior to the construction of Doyle Drive. Currently, W-6a, W-6b and W-6c receive stormwater runoff from the Lincoln Boulevard roadway above them. Wetland W-6d receives stormwater runoff from Doyle Drive roadway as well as from fracture flows.

Wetlands W-6a, W-6b, W-6c and W-6d are not within the USACE jurisdiction under *Section 404* of the *Clean Water Act* as wetland waters of the United States because they do not meet the soil criterion. These California blackberry wetlands would be classified as palustrine scrub-shrub in the Cowardin system. California blackberry and associated wetlands and Cowardin Arroyo willow scrub and associated wetlands are collectively referred to throughout this document as riparian scrub. **Exhibit 3-83** provides more information on these wetlands.

Temporary and Indirect Impacts

Construction would temporarily disturb wetlands and waters of the United States in the study area and the construction corridor. **Exhibit 3-84** shows a summary of the potential temporary impacts. Alternative 2, Alternative 5, and the Preferred Alternative may each temporarily affect a total of 0.03 hectare (0.08 acre) of USACE jurisdictional area at Tennessee Hollow (see the following section, Effects on the Existing Tennessee Hollow). Although a total of 0.01 hectare (0.02 acre) of Battery Howe-Wagner is within the construction corridor, the Preferred Alternative will temporarily affect 0.0004 hectare (0.001 acre) of Battery Howe-Wagner. All options associated with Alternative 5 would similarly affect Battery Howe-Wagner.

Exhibit 3-84
Temporary Wetland Impacts in the Doyle Drive Construction Corridor by Alternative

Total Wetland Area in Doyle Drive Construction Corridor	USACE JURISDICTION WATERS OF THE UNITED STATES (HECTARES / ACRES)	COWARDIN WETLANDS EXCLUDING USACE WETLANDS (HECTARES / ACRES)
		0.17 / 0.43
IMPACT AREAS BY ALTERNATIVE		
Alternative 2: Detour Option	0.03 / 0.08 (Tennessee Hollow)	0.01 / 0.02 (W-6b)
Alternative 2: No-Detour Option	0.03 / 0.08 (Tennessee Hollow)	0.01 / 0.02 (W-6b)
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options and the Loop Ramp Option	0.03 / 0.08 (Tennessee Hollow, Battery Howe-Wagner)	0.06 / 0.16 (W-5)
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options, the Loop Ramp Option, and a Merchant Road Slip Ramp	0.03 / 0.08 (Tennessee Hollow, Battery Howe-Wagner)	0.06 / 0.16 (W-5)
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options and the Hook Ramp Option	0.03 / 0.08 (Tennessee Hollow, Battery Howe-Wagner)	0.06 / 0.16 (W-5)
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options, the Hook Ramp Option, and a Merchant Road Slip Ramp	0.03 / 0.08 (Tennessee Hollow, Battery Howe-Wagner)	0.06 / 0.16 (W-5)
Preferred Alternative	0.03 / 0.08 (Tennessee Hollow, Battery Howe-Wagner)	0.06 / 0.16 (W-5)

The build alternatives would affect Cowardin wetlands. The Alternative 2 (both options) would temporarily affect 0.01 hectare (0.02 acre) of wetland W-6b. All options of Alternative 5 and the Preferred Alternative will affect 0.06 hectare (0.16 acre) of wetland W-5.

The combined area of Cowardin and USACE wetlands that Alternative 2, Replace and Widen Option, may temporarily disturb is 0.04 hectare (0.10 acre). All options of Alternative 5 and the Preferred Alternative will remove or substantially disturb a total of 0.09 hectare (0.24 acre).

ESAs will be designated so that no temporary impacts will occur to riparian scrub (central coast arroyo willow and blackberry and wetland) and other USACE wetlands located within or next to the construction corridor, but outside the area of temporary effect. These communities are generally more susceptible to disturbance and need to be protected.

Indirect Tunneling Effects on Wetlands

Tunneling upslope of the bluffs north of the cemetery during construction of the Presidio Parkway Alternative and the Preferred Alternative may alter or disrupt groundwater flows, potentially affecting existing plants that rely on emergent groundwater. Special consideration has been given to collecting groundwater flow around the tunnel and directing the flows to the existing wetlands to sustain their viability. Equipment that adjusts flows can be incorporated into the project so that after construction, flows can be increased or decreased.

The soil conditions, and the nature, timing, and duration of soil moisture (i.e., submersion, flooding, or soil saturation) are factors that play an important role in the physiological impact that water has on riparian species. The longer riparian species are exposed to saturated soil conditions, the greater the potential for injury. While most riparian species can tolerate short periods of saturated soil conditions during the growing season, most can withstand only 1 to 4 months of water continuously over the soil surface.

Willow species are very tolerant to changes in soil moisture if they are healthy. Depending on the current health of willows in Cowardin wetlands north of the cemetery (i.e., W-4, W-6d, W-7), these riparian species may not be substantially affected by a potential increase in water seepage from fracture flow, provided that the flows do not lead to saturated soil conditions for longer than four months. However, if increased flows to these areas are recurrent and keep the soil saturated or prevent recovery from previous disturbance, injuries to riparian species can accumulate and damage, disease (such as root-rot) or even death, may occur.

Conversely, soil water deficits can affect the normal physiology and growth of plants during the growing season. Some immediate visible effects of soil water deficits may include wilting, scorch, and some defoliation. Long-term symptoms may include dieback of branches and death of the plant as the plant's capacity to absorb water is damaged. Substantial uncertainty thus exists as to the potential effects of the Doyle Drive Project on subsurface water flows, and in turn on the health of these apparently groundwater supported wetlands.

Effects on the Existing Tennessee Hollow

None of the build alternatives would cause impacts to Tennessee Hollow in its existing condition. Although this existing drainage is included in the USACE waters in **Exhibit 3-85** it is contained in storm drain pipes within the construction corridor, and would be allowed to persist. However, 0.03 hectare

(0.08 acre) of existing Tennessee Hollow may be temporarily affected if the flow is redirected, the piping is modified, or if discharge enters the stream.

Permanent Impacts

As shown in **Exhibit 3-85** the permanent effects of Alternative 2 both options, all Presidio Parkway options, and the Preferred Alternative on USACE wetlands are expected to be identical. Build alternatives will permanently affect 0.13 hectare (0.33 acre) of USACE jurisdictional waters of the U.S. at W-2 and W-3.

Both options of Alternative 2 would permanently affect 0.07 hectare (0.17 acre) of Cowardin wetlands at W-6a and W-6c. All of the Presidio Parkway Alternative options and the Preferred Alternative will affect 0.08 hectare (0.19 acre) of Cowardin wetlands at W-6a, W-6b and W-6c.

The combined area affected will be 0.20 hectare (0.50 acre) under both options of Alternative 2, and 0.21 hectare (0.52 acre) under all Presidio Parkway Alternative options and the Preferred Alternative.

ESAs will be designated so that no permanent impacts would occur to riparian scrub (central coast arroyo willow and blackberry and wetland) and other USACE wetlands located within or next to the construction corridor, but outside the area of permanent effect.

**Exhibit 3-85
Permanent Wetland Impacts by Alternative**

	USACE JURISDICTION WATERS OF THE UNITED STATES (HECTARES / ACRES)	COWARDIN WETLANDS EXCLUDING USACE WETLANDS (HECTARES / ACRES)
Total Wetland Area in Doyle Drive Construction Corridor	0.17 / 0.43	0.49/1.21
IMPACT AREAS OF ALTERNATIVE		
Alternative 2: Detour Option	0.13 / 0.33 (W-2, W-3)	0.07 / 0.17 (W-6a,W-6c)
Alternative 2: No-Detour Option	0.13 / 0.33 (W-2, W-3)	0.0 / 0.17 (W-6a, W-6c)
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options and the Loop Ramp Option	0.13 / 0.33 (W-2, W-3)	0.08 / 0.19 (W-6a, W-6b, W-6c)
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options, the Loop Ramp Option, and a Merchant Road Slip Ramp	0.13 / 0.33 (W-2, W-3)	0.08 / 0.19 (W-6a, W-6b, W-6c)
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options and the Hook Ramp Option	0.13 / 0.33 (W-2, W-3)	0.08 / 0.19 (W-6a, W-6b, W-6c)
Alternative 5: Presidio Parkway Alternative with either Diamond or Circle Drive Options, the Hook Ramp Option, and a Merchant Road Slip Ramp	0.13 / 0.33 (W-2, W-3)	0.08 / 0.19 (W-6a, W-6b, W-6c)
Preferred Alternative	0.13 / 0.33 (W-2, W-3)	0.08 / 0.19 (W-6a, W-6b, W-6c)

Note: All USACE wetlands also qualify as Cowardin wetlands. Affected wetlands are given in parentheses and locations are shown in Exhibit 3-82 and in Appendix I of the Revised Natural Environmental Study (NES), July 2005.

Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and/or mitigation measures for the Preferred Alternative are addressed in this section.

Mitigation measures to address direct impacts and indirect impacts to USACE jurisdictional waters are required to comply with *Section 404* of the *Clean Water Act*. Similarly, mitigation measures will address impacts to Cowardin wetlands, which are protected by the NPS and Trust. Refer to *Wetland Restoration and Enhancement Mitigation Plan* in **Appendix K** for further information on wetland mitigation measures.

The goals of wetland mitigation are to:

1. Avoid, minimize or compensate (in this order) for the temporary and permanent losses of waters of the U.S. and Cowardin wetlands protected by the NPS or the Trust due to the Doyle Drive Project;
2. Satisfy the "no net loss" policy regarding type, function and value of wetlands per *Executive Order 11990* and consistent with the NPS' and Trust's policies;
3. Improve wetland and riparian value and increase wildlife habitat quality relative to those areas that would be disturbed or filled; and
4. Create successful mitigation sites that will become self-supporting natural systems over time.

Implement a General Biological Resource Monitoring Program

A complete description of this measure was presented in the preceding section.

Implement a Wetland Mitigation/Compensation Plan

Temporary impacts will be mitigated by in-kind, in-place restoration after construction at a 1:1 ratio. Following the 2005 NPS/Trust Strategy, three basic strategies for mitigation of permanent and indirect wetland impacts have been discussed with the Trust and NPS. These are: 1) wetland creation, 2) intensive wetland enhancement, and 3) wetland enhancement. The compensatory value, respectively, are 2:1, 3:1 and 5:1 ratios of created or enhanced habitat to impacted habitat based on current discussions with the NPS and the Trust.

Six sites were identified that can provide wetland creation or enhancement opportunities appropriate to address as mitigation for the project. The criteria for the site selection included:

- a) creation of new in-kind habitat;
- b) proximity to the impacted area;
- c) ability to support mature habitat systems, with similar cover, foraging and nesting opportunities to that lost; and
- d) habitat located in the same wildlife corridor as the impact.

These sites, in addition to mitigation goals and values, as presented and discussed in the 2005 and 2006 NPS/Trust Strategies, and the October 31, 2006 field meeting, provide the basic framework of the compensatory mitigation. Refer to the *Wetland Restoration and Enhancement Mitigation Plan* in **Appendix K** for further information on wetland mitigation measures described below.

Waters of the U.S. and Cowardin wetlands will be clearly marked on project maps as ESAs. To the extent feasible, the project will avoid causing impacts to waters of the United States and Cowardin wetlands. Where permanent impacts are unavoidable, compensation measures will be implemented.

Compensation Measures

Compensation for permanent impacts on wetlands will include: (1) wetland creation and restoration; (2) funding of Park agency wetland enhancement and creation projects; or (3) a combination of both (1) and (2).

Proposed Wetland Compensation Sites

All of the proposed wetland compensation sites, with inclusion of the restoration of the Eastern Tributary of Tennessee Hollow, will offset permanent and indirect impacts on waters of the U.S. and Cowardin wetlands. Six sites were chosen as potential mitigation sites for impacts on permanent and indirect wetland impacts. These sites include Dragonfly Creek, Quartermaster Reach Connection, North Fort Scott, West Crissy Bluffs, Battery East/Marina Drive, and Eastern Tributary of Tennessee Hollow. Conceptual plans for these sites involving creation and various types of enhancement are described in the *Wetland Restoration and Enhancement Mitigation Plan* included in **Appendix K**. Anticipated future restoration in the Tennessee Hollow area, particularly at the Eastern Tributary, is considered by the NPS/Trust as acceptable mitigation for wetland project impacts. The Trust is developing a restoration plan separate from the *Wetland Restoration and Enhancement Mitigation Plan*. The Doyle Drive Project would restore a total of 1.2 hectares (2.99 acres) of wetlands for permanent and potentially indirect impacts on waters of the U.S. and Cowardin wetlands.

Implementation and Monitoring Plan

Major construction activities for the project will be phased over four years. Mitigation efforts will be initiated before, concurrent with, or immediately following construction of the project. At mitigation sites not disturbed by construction activities, creation and/or enhancement activities will be initiated as soon as possible, following completion of environmental review and permitting. All such sites must be initiated prior to commencement of project construction activities, with all phases complete, except for monitoring and maintenance, by end of construction. Sites disturbed temporarily prior to the planting effort will be treated immediately following construction as described below. At these temporarily disturbed sites, no planting will occur until construction activities are completed in the mitigation areas.

During the design phase, additional geotechnical analysis will be conducted to determine the underlying water conveyance in that area. If it is determined that the nature of the fractures are such that the success of water conveyance will be in question, wetland creation will begin in advance of the project. The Trust and the NPS will review and comment on the details of the monitoring program and will be included in the distribution of those receiving periodic reports of the data and findings.

General biological monitoring will occur during construction and post-construction. Wetland mitigation monitoring will begin at the initiation of the planting phase of wetland restoration. Plant installation may be phased over three years. Wetland mitigation monitoring will continue after the plants are

installed until the plantings demonstrate successful establishment and the performance criteria have been met, which is usually about six years (i.e., three years of monitoring site restoration and plant establishment followed by three years of monitoring post site restoration and plant establishment). Success criteria for wetland mitigation are described in the *Wetland Restoration and Enhancement Mitigation Plan* (see **Appendix K**).

The criteria describe threshold levels for erosion, invasive species, irrigation, vegetation richness, hydrology, wildlife usage, and debris. The success criteria and all aspects of wetland restoration is subject to approval by the Trust and NPS.

3.4.3 Plant Species

This section discusses the individual plant species within the project study area and potential impacts of the Doyle Drive Project on these species. Native and introduced plant communities are discussed more broadly in Section 3.4.1 of this document.

Regulatory Setting

Federal Endangered Species Act of 1973

The primary federal law protecting threatened and endangered species is the *Federal Endangered Species Act* (ESA) of 1973: United States Code (USC), Section 1531, et seq. and 50 CFR Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and their ecosystems. Under *Section 7* of this act, federal agencies, such as the Federal Highway Administration (FHWA), are required to consult with the U.S. Fish and Wildlife Service (USFWS) 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.

Species of special concern are not subject to the same consultation requirements as listed endangered or threatened species. However, the USFWS and the California Department of Fish and Game (CDFG) recommend that candidate species, species proposed for listing, and species of special concern also be considered in informal consultation during a project's environmental review. This is recommended because in the event that a species were to be listed during the design or construction phases of a project, new studies and restrictions might be imposed. The current USFWS list of threatened, endangered and species of concern is located in **Appendix H**.

California Endangered Species Act

California has enacted a similar law at the state level, the *California Endangered Species Act* (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. The 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 the ESA, CDFG may also authorize impacts to CESA species by issuing a *Consistency Determination* under Section 2080.1 of the *Fish and Game Code*.

The National Park Service and the Presidio Trust Plans and Policies

The NPS and Trust plans and policies identify the goals and objectives for the Presidio of San Francisco and govern the protection of wildlife, plant species, natural communities and landscapes, and wetland and riparian habitat within the Presidio. These documents include:

- *Final General Management Plan Amendment (GMPA)* (NPS, 1994);
- *Presidio Trust Management Plan (PTMP)* (Presidio Trust, 2002);
- *Natural Resources Section of the Resources Management Plan* (National Park Service 1999c);
- *Presidio Vegetation Management Plan and Environmental Assessment (VMP)*; and
- *National Park Service (NPS) Management Policies* (NPS, 2001).

U.S. Fish and Wildlife Service Plant Recovery Plans

The NPS and Trust have identified both non-native and native habitats as potential serpentine recovery areas for the re-introduction of special-status species based on recommendations in *USFWS Recovery Plans*. The underlying goal is to enlarge existing populations and provide long-term conservation. One area under consideration is within the Doyle Drive construction corridor on the northern bluffs of the Park Presidio Interchange. The *2003 USFWS Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula* (USFWS 2003) recommends that surface exposures of serpentine rocks and soils in the Presidio should be: (i) surveyed; and (ii) assigned reasonable buffers in consultation with the USFWS under the *Endangered Species Act*. A *Biological Report of Species of Concern* was prepared since it was determined that a *Biological Assessment* and *Biological Opinion* was not necessary for the Doyle Drive Project in regard to these recovery plans because there would be no effect on listed species (Don Hankins, USFWS, November 2004), see **Appendix H** for the no effect determination.

Affected Environment

Special-Status Species

Species that are rare or vulnerable to habitat loss or population decline are classified as special-status species. Some of these species are listed by USFWS and CDFG and receive specific protection defined in federal or state endangered species legislation. Other species have not been formally listed as threatened or endangered under federal or state endangered species legislation, but have designations as fully protected, rare, sensitive, or species of local concern based on adopted policies and expertise of state resource agencies, organizations with acknowledged expertise, or policies adopted by federal government agencies on federal land and local governmental agencies such as counties, cities, and special districts with local conservation objectives. Twenty-eight special-status plants either are known to occur within the Presidio or have suitable habitat within the project study area or construction corridor.

Many of these species were reintroduced at Crissy Field Marsh and Dunes as part of a restoration and enhancement effort. Except for Davy's clarkia and California triquetrella moss, 26 species are known to occur in the project study area. Crissy Marsh and the coastal bluffs within the project study area may be potential habitat for Davy's clarkia and California triquetrella moss, although the probability of these species occurring there is low.

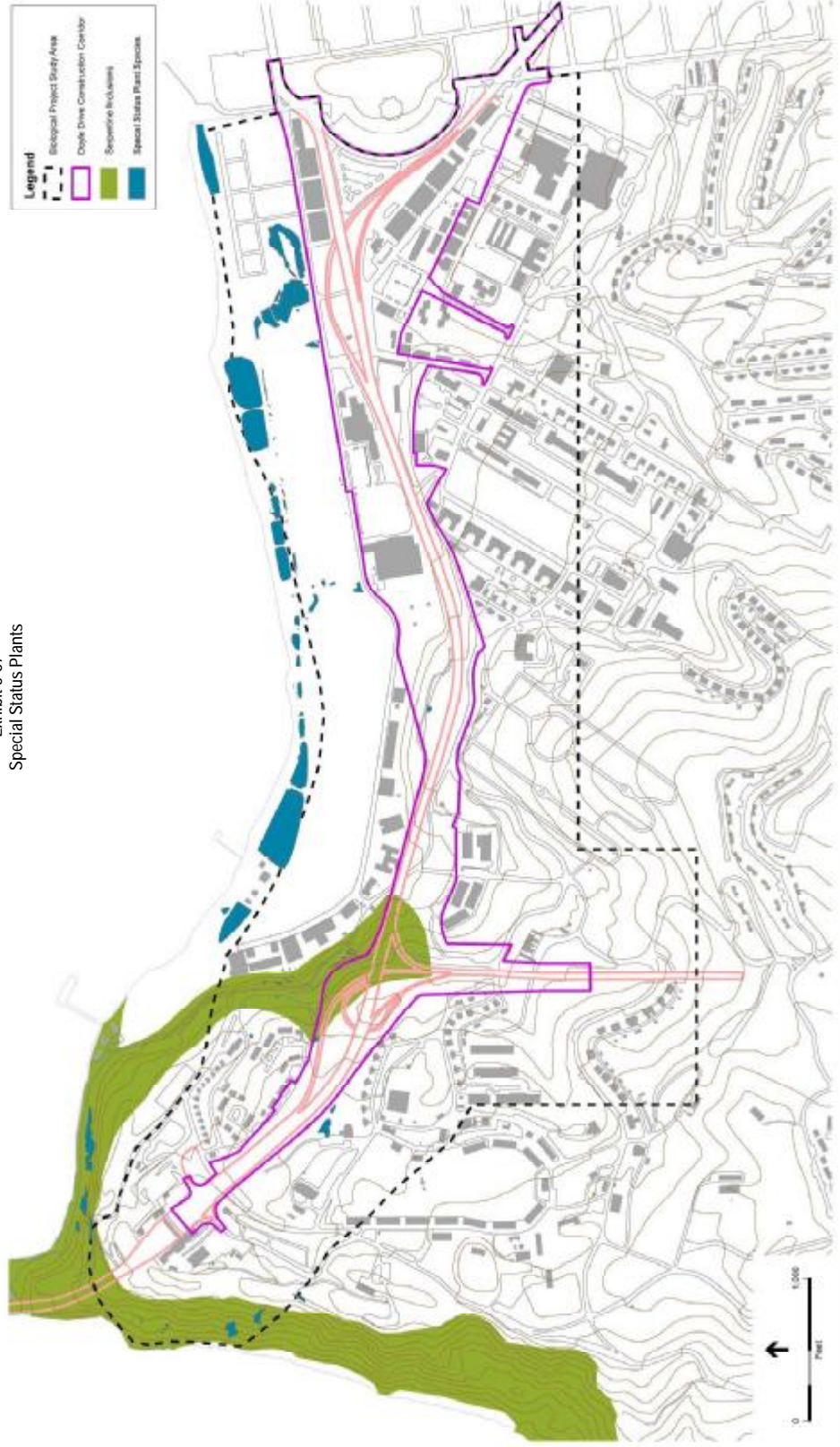
The quality of northern coastal scrub within the construction corridor is marginal because it is highly disturbed. As a result, this community is not likely to support plant species such as San Francisco campion, San Francisco spineflower, coast rock cress, Franciscan thistle, Davy's clarkia, coast Indian paintbrush, California triquetrella moss, and dune gilia. Similarly, the serpentine soil in the construction corridor does not support species such as fragrant fritillary or San Francisco owl's clover. Except for skunkweed and San Francisco gumplant, no special-status plant species are known to occur in the construction corridor, and their potential to occur within the construction corridor is low. **Exhibit 3-86** lists the species and their special-status designations. Location of special-status species within the study area is generally illustrated in **Exhibit 3-87** (on the following pages).

One area that is protected and under consideration for restoration within the construction corridor is on the northern bluffs of the Park Presidio Interchange. In its current condition, this area primarily supports non-native blue-gum eucalyptus trees, black acacia trees, and fennel. The understory consists mostly of non-native annual grasses and herbs, including big-quaking grass, wild oat, and common sow thistle. Few native perennial grasses and bulb species are present.

Exhibit 3-86
Special-Status Species in the Doyle Drive Project Study Area

Species of Federal Concern
California saltbush (<i>Atriplex californica</i>)
San Francisco spineflower (<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i>)
Franciscan thistle (<i>Cirsium andrewsii</i>)
Round-headed collinsia (<i>Collinsia corymbosa</i>)
Point Reyes bird's-beak (<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>)
San Francisco wallflower (<i>Erysimum franciscanum</i>)
Dune gilia (<i>Gilia capitata</i> ssp. <i>chamissonis</i>)
San Francisco gumplant (<i>Grindelia hirsutula</i> var. <i>maritime</i>)
San Francisco campion (<i>Silene verecunda</i> ssp. <i>verecunda</i>)
San Francisco owl's clover (<i>Triphysaria floribunda</i>)
Federal and State Listed Plants
San Francisco lessingia (<i>Lessingia germanorum</i>)
Presidio manzanita (<i>Arctostaphylos hookeri</i> ssp. <i>ravenii</i>)
Presidio clarkia (<i>Clarkia franciscana</i>)
Marin dwarf flax (<i>Hesperolinon congestum</i>)
Federally Listed Plants
California seablite (<i>Suaeda californica</i>)
Federal Species of Local Concern
Pink sand-verbena (<i>Abronia umbellata</i> ssp. <i>umbellata</i>)
Coast rock cress (<i>Arabis blepharophylla</i>)
Nuttall's milk-vetch (<i>Astragalus nuttallii</i> var. <i>virgatus</i>)
Coast Indian paintbrush (<i>Castilleja affinis</i> ssp. <i>affinis</i>)
Salt marsh owl's clover (<i>Castilleja ambigua</i> ssp. <i>ambigua</i>)
California goosefoot (<i>Chenopodium californicum</i>)
Davy's clarkia (<i>Clarkia davyi</i>)
California croton (<i>Croton californicus</i>)
Skunkweed (<i>Navarretia squarrosa</i>)
Coast rein-orchid (<i>Piperia elegans</i>)
Pacific cordgrass (<i>Spartina foliosa</i>)
Dune tansy (<i>Tanacetum camphoratum</i>)
California triquetrella moss (<i>Triquetrella californica</i>)

Exhibit 3-87
Special Status Plants



Source: Environmental Science Associates, 2004; Parsons Brinckerhoff, 2004; National Park Service, 2004, 2005.

Notes: Location of Biological Resources are conceptual and not drawn to scale.

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Currently, no federally or state endangered or threatened listed plant species are located near the Park Presidio Interchange. Lincoln Boulevard separates this non-native eucalyptus habitat from a downward sloping native plant serpentine area, which is located below the Crissy Field overlook. This native serpentine area primarily supports lizard tail, coyote brush, toyon, sticky monkeyflower, and California blackberry. San Francisco gumplant and coast rock cress are also present north of Lincoln Boulevard. Non-native species observed in the native serpentine area include cotoneaster, Monterey cypress, pampas grass, black acacia and iceplant. The non-native, invasive species French broom and cotoneaster are found below the aerial structure of Doyle Drive.

Federal or State Listed or Potentially Listed Plants

Five of the 28 special-status plants that are known to occur within the Presidio or have suitable habitat within the project study area or construction corridor are federally or state listed plants, or both. The five listed species are:

- San Francisco lessingia (*Lessingia germanorum*);
- California seablite (*Suaeda californica*);
- Presidio manzanita (*Arctostaphylos hookeri ssp. ravenii*);
- Presidio clarkia (*Clarkia franciscana*); and
- Marin dwarf flax (*Hesperolinon congestum*).

California Seablite is a Federally Listed Plant. The other four plants are both federally and state Listed.

San Francisco lessingia and California seablite occur at Crissy Marsh and are present in the project study area. None of the five federal or state listed plants are present in the construction corridor. The serpentine soil located in the northwestern portion of the project study area does not support Presidio manzanita, Presidio clarkia or Marin dwarf flax.

Temporary Impacts

Construction of the build alternatives may temporarily disturb plant species in the study area. The following presents a summary of these potential temporary impacts. No federal or state listed special-status plants are located within the construction corridor.

Alternative 1: No-Build Alternative

The No-Build Alternative would not affect existing plant communities.

Alternative 2: Replace and Widen, Alternative 5: Presidio Parkway, and Preferred Alternative: Refined Presidio Parkway

Soil runoff in the wet season during excavation and grading for the high-viaduct at the Park Presidio Interchange for all build alternatives, as well as construction of the Merchant Road Slip Ramp Option for the Presidio Parkway Alternative,

could indirectly affect federal special concern plant species and their habitat in the study area near the construction corridor.

Additionally, plant species that are of federal special concern located on the coastal bluffs adjacent to the construction corridor—coast rock cress, Franciscan thistle, San Francisco wallflower and San Francisco gumplant—could also be affected by runoff. These species are located on the downward north-facing slope approximately 91 meters (300 feet) north of the area of construction. San Francisco owl's clover is immediately south of the construction corridor in the Fort Scott area. San Francisco gumplant and skunkweed also both occur within the construction corridor.

By implementing measures such as soil stabilization controls and silt fencing, which would be mandated by the *Stormwater Pollution Prevention Plan* (SWPPP), the project would avoid causing indirect effects to plant species of concern. Additionally, plants would be fenced-off with orange fencing, which would designate the area as an Environmentally Sensitive Area (ESA).

Demolition, excavation, and grading during the dry season under the build alternatives would cause dust, which could temporarily cover the leaves of plant species of concern, thereby reducing the exchange of light and gas. Within the project study area, plants at Crissy Marsh, such as California seablite, would be particularly susceptible to the effects of dust. To minimize the effects of construction dust, the project would adhere to the basic dust control procedures specified by the Bay Area Air Quality Management District (BAAQMD) and the Caltrans special provision. This would ensure that dust emissions during the dry season would be minor and that impacts to special-status plant species would be minimal.

Permanent Impacts

The Doyle Drive Project will have no effect on special-status plant species within the construction area. No federal or state listed special-status plants are located within the construction area.

Alternative 1: No-Build

The No-Build Alternative would not affect existing plant communities.

Alternative 2: Replace and Widen

Permanent impacts resulting from Alternative 2 are the same for all build alternatives. Impacts are discussed below.

Alternative 5: Presidio Parkway

Permanent impacts resulting from Alternative 5 are the same for all build alternatives. Impacts are discussed below.

Preferred Alternative: Refined Presidio Parkway

Permanent impacts resulting from the Preferred Alternative are the same for all build alternatives. Impacts are discussed below.

Alternative 2: Replace and Widen, Alternative 5: Presidio Parkway, and Preferred Alternative: Refined Presidio Parkway

No permanent impacts to skunkweed and San Francisco gumplant are anticipated because these plant species could be re-introduced within or adjacent to their pre-disturbance areas. Both skunkweed and gumplant could respond well to seed gathering from other local populations and seeding within designated areas.

For all build alternatives, construction near Battery Blaney may result in skunkweed, a federal species of local concern, and San Francisco gumplant, a federal species of concern, being removed or disturbed. Skunkweed is located in the construction corridor next to Battery Blaney and will be affected by activities such as excavation and grading for lane widening, retrofitting and moving or installing piers as part of the Replace and Widen Alternative (including No-Detour and With Detour Options), and trenching and excavation for the battery tunnels for the Presidio Parkway Alternatives (including Diamond and Circle Drive Options) and the Preferred Alternative. The gumplant population north of Merchant Road on-ramp is also at risk, but both populations could be avoided as described below.

Much of the eastern area of the project study area is developed and paved, and provides no suitable habitat for special-status plant species. Therefore, the build alternatives will not affect special-status species in this area.

Given that the project will designate ESAs both before and during construction and implement avoidance and minimization measures, impacts to special-status plant species will be minimal.

Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and mitigation measures for the Preferred Alternative are discussed below. Refer to the NES for further information on mitigating effects to sensitive habitat and special-status plant species, and temporarily disturbed sites.

Implement a General Biological Resource Monitoring Program

See a complete description of Monitoring Program in Section 3.4.1.

Implement a Plan for Special-Status Plant Avoidance/Mitigation and Revegetation of Temporarily Disturbed Upland Vegetation

All sensitive habitat and special-status plant species within or next to the construction corridor that are not temporarily or permanently affected by the project will be designated as ESAs. These areas will include habitats and species documented in the 2001 *Vegetation Management Plan* (VMP) and the current NPS

and the Trust Natural Resources GIS database. The ESAs will be off-limits to all construction activity and will be clearly marked on the project plans. To protect against direct and indirect construction impacts, the areas will be flagged before construction and fenced-off using materials such as construction orange fencing and silt-fencing. All fencing materials will be approved by the NPS and the Trust. ESAs will be monitored by the Biological Monitor during construction to ensure that these sites are avoided. Any vegetation slated for removal, such as trees, will be clearly marked and identified on construction drawings.

If avoiding special-status plant species is not feasible, federal or state species of concern habitat will be restored at a 1.5:1 ratio as described in the following section. Funding of Park agency projects will be required if federal or state species of concern restoration is impracticable.

Revegetation of Temporarily Disturbed Areas

Within the construction corridor, all natural areas disturbed temporarily because of project activities will be revegetated and restored to the appropriate native vegetation type in natural areas, or appropriate ornamental vegetation type in landscaped areas. Revegetation and restoration will be completed in accordance with the 2001 VMP and standard NPS and Trust restoration practices. The revegetation and restoration methods will include using locally native plant material, protecting and restoring soil conditions, irrigating, and controlling aggressive non-native species.

Major construction activities for the project will be phased over five years. Mitigation efforts will be initiated before, concurrent with, or immediately following construction of the project. Revegetation will occur as soon as practicable at those sites that will not be subsequently disturbed. Seed collection and propagation will occur from January to December before the year of planting. Sites disturbed before the planting effort will be treated immediately with: (1) a seed mixture and mulch using broadcast methods; or (2) hydroseed as approved by the Trust and NPS. No planting will occur until construction activities are completed in these areas. All terrestrial and aquatic revegetation efforts will be coordinated with and approved by the Trust and NPS natural resource staff. All terrestrial and aquatic revegetation materials, including seeding, mulching and hydroseeding, will be approved by the Trust and NPS natural resource staff.

The native plants used for revegetating may include coyote brush, coffeeberry, sticky monkeyflower, yellow bush lupine, toyon, San Francisco gumplant, skunkweed, California poppy, purple needlegrass, California brome, and blue wild rye. The plants used for revegetating landscape areas will be selected in consultation with the NPS and the Trust forester. Procedures will follow current Trust forestry practices.

Maintenance and Monitoring

The project proponent will maintain the mitigation site. Maintenance will include replacing plants, maintaining erosion control materials and irrigation systems, controlling weeds, and removing trash and other debris. Maintenance may include monitoring the site every 30 days for the first three months following planting and every 60 days thereafter during the first year of plant establishment. Plants will be checked for disease and pests. Non-native invasive plants will be removed in accordance with *Executive Order 13112*. Weed removal will occur during the monitoring period if deemed necessary.

Restored and revegetated sites will be monitored throughout the plant establishment period. At the end of each monitoring period the success of the restoration effort will be assessed against the restoration goals (e.g., at least 80 percent survival of plantings, 75 percent vegetative cover by desirable species, and a viable, self-sustaining plant community). The project proponent will monitor the mitigation site at the initiation of plant installation until the plants are successfully established and the performance criteria have been met, which is usually about six years following plant installation. The Trust and the NPS are expected to manage the revegetated areas after the performance criteria have been met, which will be agreed upon by all agencies.

3.4.4 Animal Species

This section describes the wildlife that lives within the study area and the potential effects of the Doyle Drive Project on these species. Wildlife includes common species and special-status species. Common species are considered habitat generalists because they do not depend on a specific habitat type or area; their populations are usually large, and they have high dispersal rates. Species that are rare or vulnerable to various causes of habitat loss or population decline are classified as special-status species. Special-status species may also be federal or state listed species. Listed species are included on the Federal or State list of threatened or endangered species, or both.

Regulatory Setting

Section 3.4.3 of this document discusses the regulatory agencies, policies, and laws that govern the protection of wildlife. In addition, the *Migratory Bird Treaty Act* protects migratory birds in the Presidio. This treaty with Canada, Mexico and Japan makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges).

Affected Environment

The project study area has a rich biological environment, which includes special-status animal species and their habitats. Specific or multiple native plant communities and non-native introduced plant communities provide habitat for a variety of common animal species in the Presidio.

However, within the project study area, the construction corridor is a disturbed area that contains remnant native vegetation and is conducive to non-native plant growth, in addition to the non-native forest landscape that surrounds it. Because of the highly disturbed qualities of the corridor, habitat value is not considered high, although all habitat can be considered important in the highly urbanized San Francisco landscape. Smaller animals such as small mammals, reptiles, invertebrates and birds use this habitat primarily for foraging and movement purposes (primarily birds). **Exhibit 3-88**, illustrates the general location of non-native and ornamental wildlife habitat.

The following is a summary of animal species that were actually observed or are expected to use each natural community. **Exhibit 3-89**³⁹, provides a listing of common birds in the Presidio.

Common Species

Birds

A variety of common avian species are attracted to the natural plant communities, non-native habitats and landscaped habitats in the Presidio and use them for perching, nesting, and foraging habitat.

Mammals

Mammals that are likely to be in the Presidio or were observed are presented in **Exhibit 3-90**.

Amphibians

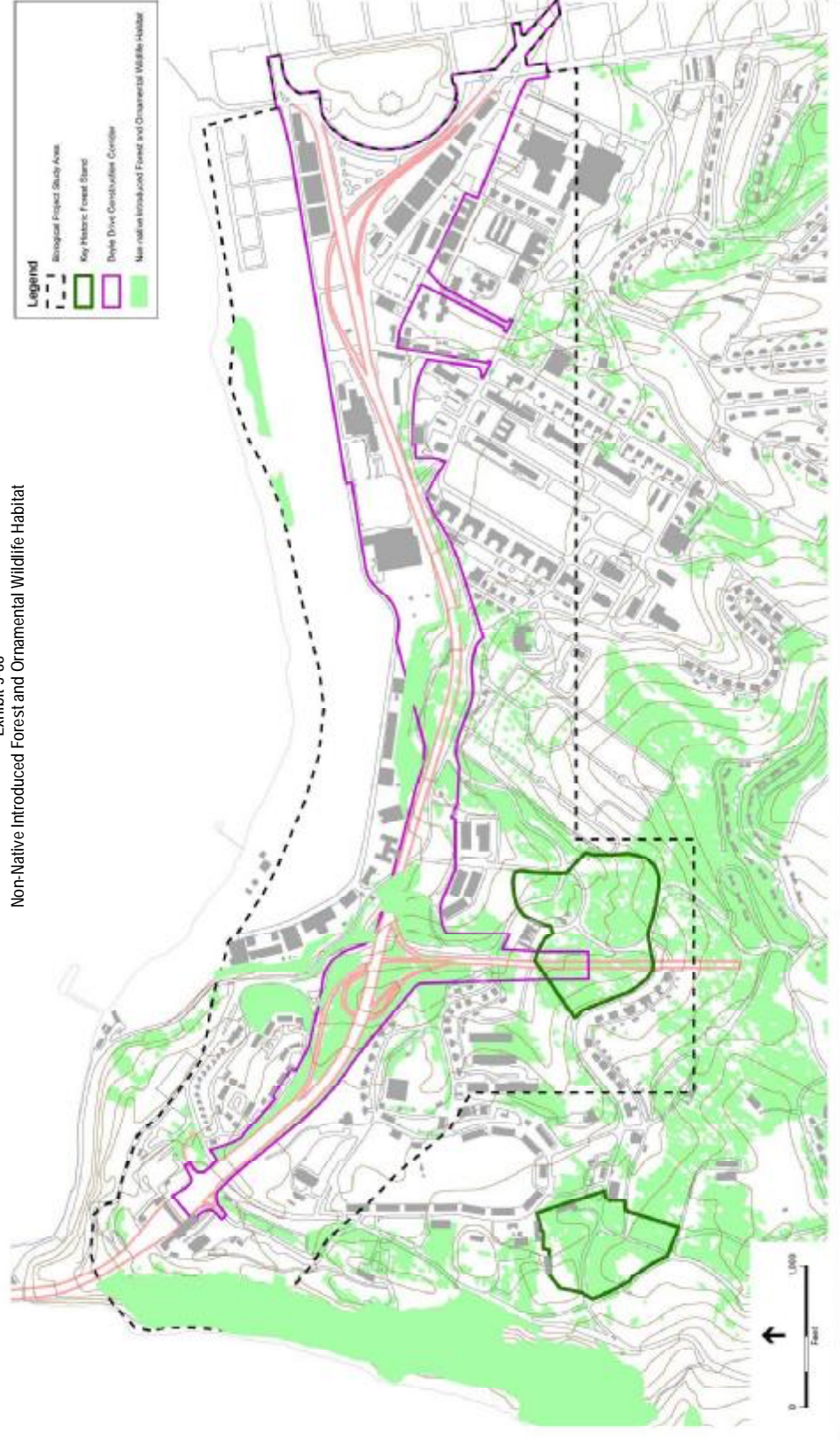
Riparian scrub habitats are an important breeding habitat for amphibians. The physical structure of arroyo willow trees provides a protected travel corridor between aquatic and upland habitat types.

Reptiles

The sandy soils of northern coastal scrub habitat provide burrowing habitat for reptiles, such as the western fence lizard. These reptiles also use grassland habitat for feeding on invertebrates, which are found within and underneath grass tussocks.

³⁹ *Exhibit 3-89 and Exhibit 3-90 associate some species with non-native vegetation, because they are frequently observed there. These species use native vegetation as well. In addition, other species listed in these exhibits can be found in other habitats.*

Exhibit 3-88
 Non-Native Introduced Forest and Ornamental Wildlife Habitat



Source: Environmental Science Associates, 2004; Parsons Brinckerhoff, 2004; National Park Service, 2001; The Presidio Trust, 2001, 2005.

South Access to the Golden Gate Bridge - Dyer Corp EIR/CEIR
 Chapter 3: Project Description, Environmental Consequences, and Mitigation
 Appendix A: Study Area Maps

Exhibit 3-89
Common Bird Species in the Presidio

COMMON NAME	SCIENTIFIC NAME
American robin	<i>Turdus migratorius</i>
Anna's hummingbird	<i>Calypte anna</i>
black phoebe	<i>Sayornis nigricans</i>
black-headed grosbeak	<i>Pheucticus melanocephalus</i>
black-throated gray warblers	<i>Dendroica nigrescens</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
California quail	<i>Callipepla californica</i>
California towhee	<i>Pipilo crissalis</i>
Caspian tern	<i>Sterna caspia</i>
chestnut-backed chickadees	<i>Parus rufescens</i>
chipping sparrows	<i>Spizella passerina</i>
common raven	<i>Corvus corax</i>
European starling	<i>Sturnus vulgaris</i>
Forster's tern	<i>Sterna forsteri</i>
great egret	<i>Ardea alba</i>
Heermann's gull	<i>Larus heermanni</i>
hummingbird	<i>Selasphorus spp.</i>
Hutton's vireo	<i>Vireo huttoni</i>
kinglet	<i>Regulus spp.</i>
lesser goldfinch	<i>Carduelis psaltria</i>
mallard	<i>Anas platyrhynchos</i>
marsh wren	<i>Cistothorus palustris</i>
mourning dove	<i>Zenaidura macroura</i>
northern harrier	<i>Circus cyaneus</i>
northern mockingbird	<i>Mimus polyglottos</i>
northern shoveler	<i>Anas clypeata</i>
orioles	<i>Icterus spp.</i>
pygmy nuthatches	<i>Sitta pygmaea</i>
rock dove	<i>Columba livia</i>
sanderling	<i>Calidris alba</i>
scrub jay	<i>Aphelocoma californica</i>
snowy egret	<i>Egretta thula</i>
song sparrow	<i>Melospiza melodia</i>
spotted towhee	<i>Pipilo maculatus</i>
warblers	<i>Dendroica spp.</i>
western sandpiper	<i>Calidris mauri</i>
willet	<i>Catoptrophorus semipalmatus</i>
Wilson's warbler	<i>Wilsonia pusilla</i>
wrentit	<i>Chamaea fasciata</i>
yellowlegs	<i>Tringa sp.</i>

Exhibit 3-90
Common Mammals Observed or Likely to be in the Presidio

COMMON NAME	SCIENTIFIC NAME
Botta's pocket gopher	<i>Thomomys bottae</i>
California ground squirrel	<i>Spermophilus beecheyi</i>
California vole	<i>Microtus californicus</i>
Coyote	<i>Canis latrans</i>
deer mouse	<i>Peromyscus maniculatus</i>
fox squirrel	<i>Sciurus niger</i>
Grey fox	<i>Urocyon cinereoargenteus</i>
Norway rat	<i>Rattus norvegicus</i>
raccoon	<i>Procyon lotor</i>
striped skunk	<i>Mephitis mephitis</i>
western harvest mouse	<i>Reithrodontomys megalotis</i>

Special-Status Animal Species

Eleven special-status species may occur in the project study area. None of these species are listed as threatened or endangered. These are:

- Tree lupine moth (*Grapholita edwardsiana*);
- California yellow warbler (*Dendroica petechia brewsteri*);
- Allen's hummingbird (*Selasphorus sasin*);
- Red-tailed hawk (*Buteo jamaicensis*);
- Red-shouldered hawk (*Buteo lineatus*);
- Cooper's hawk (*Accipiter cooperi*);
- Great horned owl (*Bubo virginianus*);
- American kestrel (*Falco sparverius*);
- Western screech-owl (*Otus kennecottii*);
- San Francisco forktail damselfly (*Ischnura gemina*); and
- Yuma myotis bat (*Myotis yumanensis*).

The tree lupine moth is a federal special concern species. Coastal sand dunes are typically associated with the moth's larval host plant, yellow bush lupine (*Lupinus arboreus*). The tree lupine moth is found at several locations south of the Golden Gate Bridge.

The California yellow warbler breeds between April and August with a peak in June and uses riparian deciduous habitats throughout California with the exception of deserts and the Central Valley. Yellow warblers have been observed at Crissy Field.

Allen's hummingbird frequents brush and woodlands and is known to breed at the Presidio.

Red-tailed hawk, red-shouldered hawk, Cooper's hawk, American kestrel, great-horned owl, and western screech owl are protected in California under *California Fish & Game Code* §3503.5. All of these species nest in either dead or living large trees, including conifers and eucalyptus, located in forest or woodland habitat. All of these species have been observed, and are known or suspected to nest, in the Presidio, and all may potentially use trees within the construction corridor for nesting.

According to past surveys, suitable habitat for San Francisco forktail damselfly is sparse within the project study area. Potential habitat for this damselfly species is present in Tennessee Hollow and in a seep behind Building 926. San Francisco forktail damselfly has been observed along Marina Drive outside the general study area and construction corridor.

In April 2002, the project study area was surveyed for potential bat roosts. No bats were observed and no evidence of use by bats (fecal matter or staining) was observed. Some modest structural habitat is available, yet the Yuma myotis bat was not observed in the general study area.

A number of special-status birds have been observed at the Presidio. The majority of these are rare to uncommon seasonal migrants that do not breed at the Presidio or in the state. For example, the double crested-cormorant (*Phalacrocorax auritus*) is a common non-breeding resident. The California gull (*Larus californicus*) is a common visitor to the Presidio but does not breed there. Ferruginous hawk (*Buteo regalis*), Vaux's swift (*Chaetura vauxi*), harlequin duck (*Histrionicus histrionicus*), and long-billed curlew (*Numenius americanus*) are among the uncommon seasonal migrants that also do not breed at the Presidio.

Federal or State Listed or Potentially Listed Animals

No species listed as threatened or endangered are known to breed in the Presidio. The current USFWS list of threatened, endangered and species of concern is located in **Appendix H**. The listed species discussed in this section are known either to occur in the Presidio or have suitable habitat in the Presidio.

Invertebrates

Federal or state listed invertebrates include three species, Bay checkerspot butterfly (*Euphydryas editha bayensis*), Mission blue butterfly (*Icaricia icarioides missionensis*), and San Bruno elfin butterfly (*Incisalia mossii bayensis*). Bay checkerspot butterfly inhabits native grasslands in the San Francisco Bay area on serpentine soils with its associated host plants *Plantago erecta*, *Castilleja densiflora* and *C. exserta*. Only one record documents the occurrence of this species at Twin Peaks located outside of the Presidio. Bay checkerspot has not been detected at the Presidio in previous studies. The project study area does not contain any host plants that support this species.

San Bruno elfin butterfly occurs in coastal scrub and bunchgrass grasslands with its larval food plant *Sedum spathulifolium*. All known populations are from San Mateo County, and this species has not been detected near the project study area during past surveys.

Mission blue butterfly occurs in grassland and coastal scrub with its larval food plants (*Lupinus albifrons*, *L. variicolor* and *L. formosus*). This species is primarily known from San Mateo County, but occurs at Twin Peaks and at the north end of Golden Gate Bridge in Marin County. Mission blue butterfly has not been recently observed in the Presidio. The project study area does not contain any host plants to support this species.

Amphibians

California red-legged frog (*Rana aurora draytonii*) requires ponds and habitat elements such as upland refugia, which are not present within the project study area or construction corridor.

The most recent document that evaluates suitable habitat for the California red-legged frog is the 2002 U.S. Fish and Wildlife Service (USFWS) Recovery Plan for the species. This document describes the frog as breeding in a variety of aquatic habitats, from deep pools to marshes and sag ponds, and in shallow sections of streams with and without riparian vegetation. Because larvae typically metamorphose between July and September, depressions incapable of holding water into this period would be unlikely to support successful reproduction. Moreover, because egg masses (deposited between November and April) need to be laid in water, ponding of a depth sufficient to float egg masses must be present during this period to even attract frogs to breed at the site.

The wetland sites within and next to the limits of the construction corridor are not the result of ponded water at any time of year. The largest and most diverse sites are on a hillside, which allows some water to accumulate at the bottom of the slope, but a concrete drainage channel conducts this water away. Where the channel is absent, water is briefly held but not collected. A strip of saturated soil supports a few cattails (*Typha sp.*) but does not have a defined bank or bed.

Birds

Federal and/or state listed bird species include marbled murrelet (*Brachyramphus marmoratus*), western snowy plover (*Charadrius alexandrinus*), little willow flycatcher (*Empidonax traillii brensteri*), willow flycatcher (*Empidonax traillii extimus*), American peregrine falcon (*Falco peregrinus anatum*), bald eagle (*Haliaeetus leucocephalus*), brown pelican (*Pelecanus occidentalis californicus*), and California least tern (*Sterna antillarum browni*).

Peregrine falcon is an uncommon non-breeding resident of the Presidio. Brown pelicans are regular visitors along the shores of the Presidio, but it does not nest in the Presidio. Western snowy plover is a non-breeding overwintering resident of the shores of the Presidio. The other species are rare seasonal visitors during the non-breeding season.

Temporary Impacts

Common Wildlife

Construction of the project may disturb or directly cause the mortality of common wildlife species, as well as habitat loss and degradation. Causes of mortality may include road kills and destruction of burrows and nests during the construction phase of the project. Construction noise may reduce habitat quality, causing the displacement of some animals. Such habitat losses may be permanent for certain burrowing mammals, whose populations may be eliminated. Impacts to common wildlife species are considered minor.

Night construction will require lighting, which adds another type of impact beyond the effects of noise discussed above/elsewhere in this FEIS/R. There are current sources of night lighting in the project area and to some degree it is part of the existing environment. However, construction lighting is expected to be considerably brighter. This raises the possibility of light as an attractant, especially for migratory birds, a phenomenon observed by Reed et al. (1985). Although this will be an adverse impact, an assessment of the degree of impact will be difficult to determine. The same study found that shielding lights to prevent upward radiation decreased attraction by nearly 40 percent. The NPS/Trust have made a determination that the effects may be potentially considerable; therefore the reduction of upward radiation by the best available and feasible means (for example, downward-pointing lights, side shields and visors), as agreed upon by the NPS and Trust, will be used along Doyle Drive, and will be considered part of the project. In order to insure the use of the best available current data, a *Night Lighting Plan* will be developed as part of final mitigation design. Other methods of impact reduction (large screens, for example) will have their own impact on night flying birds and bats and will not be used.

Wildlife Corridor

Activities such as grading and trenching for all build alternatives will temporarily disrupt a segment of a primary corridor used by urban wildlife. This corridor is in the northern portion of the Presidio between the Pacific Ocean and coastal bluffs in the west and the non-native introduced forest in the east. Smaller animals such as small mammals, reptiles, invertebrates, and primarily birds use this habitat and corridor mainly for foraging and movement purposes. Construction in this corridor may further restrict wildlife movement, which is already impeded by the barrier of Doyle Drive and considerable habitat fragmentation and degradation. Passage under raised structures and causeways will be difficult for some bird species, and wildlife movement along a north-south axis might be affected. This impact is considered adverse, but minor, and localized in the Presidio. For further discussions on the wildlife corridor refer to the *Doyle Drive Project Wetland and Wildlife Corridor Mitigation Prospectus* in **Appendix K**.

Special-Status Invertebrate Species

Dust generated by construction activities may indirectly affect plant vigor and survival, and cause plants to become unsuitable for perching, metamorphosing nymphs (immature stage), or egg-laying, or unpalatable for foraging invertebrates. Effects on special-status invertebrate species due to dust emissions during the dry season will be minor because dust control procedures will be implemented as part of the project.

The habitat for the tree lupine moth will be affected by the construction of all build alternatives, which will require clearing the larval host plant, yellow bush lupine.

Removing wetland emergent vegetation, such as the freshwater wetland (map symbol W-8), within the construction corridor may result in the mortality of eggs and larvae of the San Francisco forktail damselfly. However, none of the build alternatives will directly affect W-8. The effect is minor for all build alternatives.

Special-Status Avian Species

Construction of all build alternatives may result in the mortality or reduced productivity of nesting special-status raptors and other avian species. Within and next to the construction corridor, the yellow warbler, for example, is protected against impacts to suitable roosting and nesting habitat during the breeding season under *California Fish and Game Codes 3503* and *3503.5* and the *Migratory Bird Treaty Act*. Bird nest surveys will be conducted immediately before construction to assess the actual number of bird nests that may be affected by the proposed project and formulate appropriate mitigation measures.

Construction for the build alternatives includes grading and tree removal for lane widening, tunnel cutting and trenching, grading and moving or installing piers, and creating staging areas and haul roads. These activities will affect wildlife habitat created by the non-native introduced tree forest and the arroyo willow wetland areas north of the cemetery.

Mitigation measures incorporated into the project for all build alternatives will ensure that the loss of birds, their young, or active nests will not be extensive.

Raptors nesting or foraging near ongoing disturbances perceived as non-threatening are more prepared for human intrusion than raptors inhabiting more remote areas. This suggests that the indirect effects of construction activity within the construction corridor will be negligible, since ambient noise levels from moving vehicles and humans in the project study area are already high. Construction noise within the construction corridor will be indistinguishable from what occurs at present. This conclusion is not intended to suggest that the pattern or intensity of construction activity is exactly analogous to ambient disturbance, but that the effect of such disturbance would not be measurable. Therefore, the effect on avian species is minor for all build alternatives.

The exception will be the effects of conventional pile driving, which can cause concussive noises in excess of 100 dBA. In general, animals exposed to such sounds at first instance can be expected to display a startle reaction that might cause, for example, a bird to briefly or permanently abandon a nest, causing some increase in the exposure of the eggs to heating, cooling, or predation. These reactions are similar to those caused by other disturbances such as cars backfiring, a sonic boom, or humans approaching the nest site. The impact of pile driving on birds is considered adverse for all build alternatives.

Federal or State Listed Special-Status Species

No state or federal threatened or endangered animal species will be affected by the Doyle Drive Project.

Permanent Impacts

The Doyle Drive Project will have no effect on any state or federal listed animal species or designated critical habitat. The long-term impact of all build alternatives is the loss of minor amounts of wildlife habitat. The Doyle Drive footprint created by the build alternatives will include:

- wider lanes (all build alternatives);
- an expanded Presidio Parkway Interchange and Veterans Boulevard (Presidio Parkway Alternative Diamond and Circle Drive); and
- an expanded Presidio Parkway Interchange and Veterans Boulevard (Preferred Alternative).

The greatest impact of all build alternatives is the permanent removal or damage of non-native vegetation. The area of impact to non-native introduced forest and ornamental wildlife habitat within the construction corridor varies for each alternative: 2.37 hectares (5.86 acres) for Alternative 2, No Detour Option; 2.57 hectares (6.35 acres) for Alternative 2, With Detour Option; 4.61 hectares (11.39 acres) for the Preferred Alternative; 5.07 hectares (12.54 acres) for Alternative 5 (Diamond, Circle, Hook Merchant Options) Diamond/Circle/Hook/Merchant.

The project will require removing existing structures within the construction corridor, which may affect bat habitat. During the habitat assessment for the project, bats were not observed however, habitat is available at: (a) the wood framed, composite-shingled single-level building (Building 230) scheduled for removal; and (b) portions of the existing elevated roadway, which contains expansion joints that provide possible sites for day and night roosting.

Avoidance, Minimization, and/or Mitigation Measures

For the Preferred Alternative, the following measures to avoid and minimize impacts (including effects of pile-driving) to wildlife will be implemented. Refer to the NES for further information on wildlife mitigation measures.

Implement a General Biological Resource Monitoring Program

See a complete description of this measure in Section 3.4.1. In addition, a *Night Lighting Plan* will be developed as part of final mitigation design.

Implement a Special-Status Bird Avoidance/Mitigation Plan

The goal of bird mitigation is to avoid the loss of active bird nests, from the onset of reproductive behavior through the fledging of young. Periodic surveys will be conducted before and during construction for raptors and other native avian species. Mitigation actions are situation-specific, and the need for and type of action are determined by qualified biologists as the work is taking place. In compliance with the *Federal Migratory Bird Treaty Act* and *California State Fish and Game Code*, such actions will include either: (1) restricting project construction to between September 1 through December 31; or (2) if it is not practical and feasible that a construction window, which restricts project construction to between September 1 through December 31, can be incorporated as part of the proposed project, then minimize impacts to nesting birds by designating buffer zones 90 to 150 meters (300 to 500 feet) around nests identified by the surveying biologist. Also, vegetation will be removed (to the least extent practicable) during the non-nesting season (September 1 through December 31) to reduce the possibility that nests will occur within the construction corridor. Refer to Cultural Resources Section and Noise and Vibration Section for construction methods to be used to reduce noise and vibration effects.

Although it is not really a part of the mitigation measures for the effects of construction, the final restoration planting of Doyle Drive will avoid using plant species along or on the median of the roadway which will attract birds. The purpose of this is to reduce potential for vehicle-related bird mortality. Plants will not include seed or berry-producing genera such as *Acacia*, *Alnus*, *Cornus*, *Heteromeles*, *Prunus* or *Ribes*.

Implement a Special-Status Bat Avoidance/Mitigation Plan

To protect breeding bats at the Doyle Drive Project site, pre-construction surveys and avoidance measures will be implemented. Pre-construction surveys for breeding or roosting bat species, including Yuma myotis bat, are proposed in the event that bats occupy buildings or structures during the year preceding actual demolition and construction.

Implement Best Management Practices (BMPs) to Minimize Impacts on Invertebrates

The overall mitigation goal is to avoid and minimize temporary construction related impacts and long-term project impacts to natural communities. In regard to temporary construction related impacts, BMPs for construction that are summarized above and identified in the NES will be incorporated as part of the proposed project. Additionally, habitat for special-status invertebrates will be restored. No additional measures are proposed.

3.4.5 Invasive Species

This section describes plant and animal species within the project study area that are considered invasive species.

Regulatory Setting

National Park Service (NPS) and Trust policies regarding the protection of native plant communities are described in Section 3.4.1. In addition, *Executive Order 13112*, issued in 1999, requires 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.”

The FHWA guidance, issued on 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 *National Environmental Policy Act* (NEPA) analysis for a proposed project.

Affected Environment

Disturbance of northern coastal scrub within the construction corridor is considered a combination of both human and natural events. It is very open and is subject to eroding soils as shown by existing erosion control mats in the sandy hills beneath Doyle Drive. Invasive plant species typically colonize open and disturbed ground and can indicate a high level of disturbance (historical or ongoing).

The majority of the non-native introduced forest (understory scrub) and central coast arroyo willow scrub are highly disturbed, indicated by the presence of certain invasive plant species (e.g., cape ivy [*Delaria odorata*], English ivy [*Hedera helix*], and cotoneaster [*Cotoneaster* sp.]). Cape ivy is also present approximately 30 meters (100 feet) north of the Doyle Drive construction corridor, along with wild radish (*Raphanus sativus*), a moderately invasive species, which occurs on the northern coastal bluffs. French broom (*Genista monspessulana*) occurs below the aerial structure of Doyle Drive. Invasive species are present in willow riparian habitat as well.

Temporary Impacts

Temporary disturbances resulting from construction activities may affect the distribution of invasive plant species in the study area.

Permanent Impacts

Invasive plant and animal species have evolved to reproduce in high numbers and use an environmental niche or ecosystem. Permanent impacts will vary, depending on the type of species. It is likely that various weedy, invasive plants will establish along portions of the Doyle Drive alignment even with judicious pre- and post-construction management. Under certain circumstances, invasive

species can be totally eradicated from specific areas. More often, the control or management of invasive species is an ongoing, long-term practice.

Avoidance, Minimization, and/or Mitigation Measures

Avoidance and minimization measures for the Preferred Alternative will be included in the project to address invasive species.

Implement Best Management Practices to Limit the Spread of Invasive Species

The project will comply with *Executive Order 13112*, and subsequent guidance from the FHWA. Erosion control and landscaping included in the construction of the project will not use species listed as invasive. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas. Precautions will include: inspecting and cleaning construction equipment; implementing eradication strategies should an invasion occur; and discouraging colonization of invasive, non-native species by stabilizing disturbed soil areas affected by construction areas as soon as they are completed.

Additionally, the project proponent will make available \$10,000 annually, for up to five years, to fund projects controlling or removing non-native vegetation throughout the Presidio. Application for the funds may be made to the proponent either by the Trust or the NPS, depending on the location of the plant population (i.e., under the jurisdiction of the Trust or NPS).

3.5 The Relationship between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

The Doyle Drive Project has been planned in conjunction with the *Presidio Trust Management Plan* (PTMP) and the National Park Service's *Final General Management Plan for the Golden Gate National Recreational Area* (GMPA) which consider the need for present and future traffic requirements within the context of present and future land use development. As such, the local short-term impacts and use of resources by the proposed action is consistent with the maintenance and enhancement of long-term productivity for the local area and the Presidio.

3.6 Irreversible and Irrecoverable Commitments of Resources which would be Involved in the Doyle Drive Project

Implementation of the Doyle Drive 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 will ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material are expended. Additionally, large amounts of labor and natural resources are used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Any construction will also require a substantial one-time expenditure of both state and federal funds which are not retrievable.

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CHAPTER FOUR

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) EVALUATION

In July 2006, both the Citizens Advisory Committee (CAC) and the Doyle Drive Executive Committee recommended a Preferred Alternative. The Preferred Alternative consists of a refined Presidio Parkway Alternative with the Modified Hook Ramp Option at the Park Presidio Interchange and the Diamond Interchange Option for the east end of the project alignment. The Preferred Alternative resulted from several design refinements made to the Presidio Parkway Alternative (Alternative 5) to reduce construction costs and address various environmental concerns. Additional environmental analysis was conducted on the slight modifications and shared with the responsible agencies. Ultimately, no additional environmental impacts would result from the Preferred Alternative. This chapter describes those potential environmental effects for all alternatives, including the Preferred Alternative, identified in Chapter 3 that would be considered significant under the *California Environmental Quality Act* (CEQA).

This combined *Final Environmental Impact Statement/Report* (FEIS/R) has been prepared in accordance with CEQA and the *National Environmental Policy Act* (NEPA). While CEQA requires that identification of the level of significance for each impact be stated in an *Environmental Impact Report* (EIR), 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 NEPA/CEQA EIS/R. These criteria and determinations are identified and described in this chapter.

4.1 Determining Significance under CEQA

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.

4.1.1 Significance Criteria

Analysis of each project alternative was conducted to determine if there would be an impact to 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. **Exhibit 4-1**, on the following two pages, summarizes the significance of temporary, long-term, and cumulative environmental impacts of the Doyle Drive Project alternatives 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 diminished until mitigation successfully accomplishes the desired goals.

Chapter 3 of this document 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 baseline for comparison with other alternatives.

4.2 Potentially Significant Impacts

This section discusses the resources which will experience significant impacts as a result of the Doyle Drive Project.

4.2.1 Cultural Resources

As outlined in Appendix G of the *CEQA Guidelines*, would the project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

Significant cultural resources for the purposes of CEQA are those resources that are eligible for or are listed in the *California Register of Historical Resources* (CRHR). All resources that have been determined eligible for or are listed in the *National Register of Historic Places* (NRHP) are automatically eligible for the CRHR and as such, are considered 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 considered to be 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.”

**Exhibit 4-1
Determination of the Level of Significance for Environmental Impacts of the Doyle Drive Project under CEQA**

ENVIRONMENTAL ISSUE	PERMANENT IMPACTS		TEMPORARY IMPACTS		CUMULATIVE IMPACTS	
	REPLACE AND WIDEN	PRESIDIO PARKWAY & PREFERRED ALT	REPLACE AND WIDEN	PRESIDIO PARKWAY & PREFERRED ALT	REPLACE AND WIDEN	PRESIDIO PARKWAY & PREFERRED ALT
GEOLOGY AND SOILS: SEISMIC	Significant; less than significant with mitigation incorporated	Significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Less than Significant	Less than Significant
GEOLOGY AND SOILS: SERPENTINITE	Less than Significant	Significant Unavoidable	Less than Significant	Significant Unavoidable	Less than Significant	Significant Unavoidable
HYDROLOGY, WATER QUALITY, STORM RUNOFF	Less than Significant	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated
HAZARDOUS WASTE	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated
AIR QUALITY	Less than Significant	Less than Significant	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Less than Significant	Less than Significant
NOISE AND VIBRATION	Less than Significant	Less than Significant	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Less than Significant	Less than Significant
ENERGY	Less than Significant	Less than Significant	Less than significant	Less than significant	Less than Significant	Less than Significant
WETLANDS	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated	Significant; less than significant with mitigation incorporated

**Exhibit 4-1
Determination of the Level of Significance for Environmental Impacts of the Doyle Drive Project under CEQA — Continued**

ENVIRONMENTAL ISSUE	PERMANENT IMPACTS		TEMPORARY IMPACTS		CUMULATIVE IMPACTS	
	REPLACE AND WIDEN	PRESIDIO PARKWAY & PREFERRED ALT	REPLACE AND WIDEN	PRESIDIO PARKWAY & PREFERRED ALT	REPLACE AND WIDEN	PRESIDIO PARKWAY & PREFERRED ALT
VEGETATION	Significant; less than mitigation incorporated	Significant; less than mitigation incorporated	Significant; less than mitigation incorporated	Significant; less than mitigation incorporated	Significant; less than mitigation incorporated	Significant; less than mitigation incorporated
WILDLIFE	Significant; less than mitigation incorporated	Significant; less than mitigation incorporated	Significant; less than mitigation incorporated	Significant; less than mitigation incorporated	Significant; less than mitigation incorporated	Significant; less than mitigation incorporated
PARKS, RECREATION AREAS	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
LAND USE, PLANNING AND GROWTH	Significant Unavoidable	Significant Unavoidable	Less than Significant	Less than Significant	Less than Significant	Less than Significant
COMMUNITY IMPACTS (SOCIAL, ECONOMIC) AND ENVIRONMENTAL JUSTICE	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
UTILITIES AND EMERGENCY SERVICE	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
TRAFFIC/TRANSPORTATION/ PEDESTRIAN AND BICYCLE FACILITIES	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
VISUAL/AESTHETICS	Significant Unavoidable	Less than Significant	Significant Unavoidable	Significant Unavoidable	Significant Unavoidable	Less than Significant
HISTORIC RESOURCES	Significant Unavoidable	Significant Unavoidable	Significant Unavoidable	Significant Unavoidable	Significant Unavoidable	Significant Unavoidable
ARCHAEOLOGICAL RESOURCES	Less than Significant	Significant Unavoidable	Less than Significant	Less than Significant	Less than Significant	Less than Significant

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 *California Register* or be considered to be 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 Doyle Drive Project on six properties considered historical resources for the purposes of CEQA. These include the Presidio National Historic Landmark District (NHLD), the Golden Gate Bridge to which Doyle Drive is a contributor, the Doyle Drive Marina and Presidio Viaducts (individually NRHP eligible and historical resources under CEQA), archaeological site CA-SFR-6/26, and the Palace of Fine Arts.

The Replace and Widen Alternative would impact the Presidio NHLD through the removal and replacement of Doyle Drive, which is a contributing element of the Presidio NHLD. The Replace and Widen Alternative, No-Detour Option would impact the Presidio NHLD through the alteration of the following contributing elements: Battery Blaney Road, Veterans Boulevard (Highway 1), Lincoln Boulevard, and Crissy Field Avenue. In addition, there would be impacts to the cultural landscape of the Presidio NHLD due to the alteration or removal of existing cultural landscape features and the addition of new non-historic features into the cultural landscape.

The With Detour Option would additionally impact the Presidio NHLD through the removal of Buildings 1182, 1183, 1184, and 1185 (four of the seven Mason Street warehouses), which are contributing elements of the district. These impacts would not result in a substantial adverse change in the NHLD because it will still retain sufficient integrity to convey its historical significance and would remain eligible for the *California Register* and be considered an historical resource under CEQA.

The Replace and Widen Alternative, both With Detour and No-Detour Options, would cause an impact to the Golden Gate Bridge through the destruction of Doyle Drive, which is also eligible for the NRHP as a contributor to the Golden Gate Bridge. This alternative would also cause indirect impacts to the Golden Gate Bridge by introducing new visual elements in place of existing contributing elements. These impacts would not result in a substantial adverse change in the Golden Gate Bridge because it will still retain sufficient integrity to convey its historical significance and would remain eligible for the *California Register* and be considered an historical resource under CEQA.

The Replace and Widen Alternative, both With Detour and No-Detour Options, would cause a substantial adverse change to the Marina and Presidio Viaducts of

Doyle Drive (determined individually NRHP eligible and are historical resources under CEQA) because they would be demolished.

The Replace and Widen Alternative, both With Detour and No-Detour Options, would not result in substantial adverse change to the Palace of Fine Arts, nor would archaeological site, CA-SFR-6/26, experience substantial adverse change because the area will be designated as an Environmentally Sensitive Area (ESA) and protected during construction.

The Presidio Parkway and Preferred Alternatives will impact the Presidio NHLD through the destruction of the following contributing elements of the Presidio NHLD: Doyle Drive (including the high-viaduct and low-viaduct), Building 201, Building 204, Building 230, Building 670, and Building 1151 (under the Presidio Parkway Alternative, Circle Drive Option only), as well as Bank Street, Veterans Boulevard (Highway 1), Battery Blaney Road, Crissy Field Avenue, Cowles Street (under the Presidio Parkway Alternative, Hook Ramp Option and Preferred Alternative only), Girard Road, Gorgas Avenue, Halleck Street, Marshall Street, and Lincoln Boulevard.

Under the Preferred Alternative, Buildings 230 and 670 will be demolished to make way for the parkway. The top story of Building 201 will be removed, stored during construction of the project, and then relocated and restored at its original Halleck Street location. Building 204, which had been previously moved to its current location and a portion of the building removed when Doyle Drive was originally built, will also be removed with useable building components salvaged. Building 228 will be affected by the raising of the west end of Halleck Street. The raising of Halleck Street in order to cross over a tunnel segment of Doyle Drive will have an effect on the setting of Building 228 and the Halleck Street area. A final decision as to the treatment of buildings will be determined prior to the completion of the *Programmatic Agreement* (PA).

In addition, both the Presidio Parkway and Preferred Alternatives will cause indirect impacts to the Presidio NHLD by introducing visual elements that will diminish the integrity of the linkage and physical plan of the district, i.e., the cultural landscape. These impacts will not result in a substantial adverse change in the NHLD because it will still retain sufficient integrity to convey its historical significance and will remain eligible for the *California Register* and be considered an historical resource under CEQA.

The Presidio Parkway and Preferred Alternatives will cause a direct impact to the Golden Gate Bridge through the destruction of Doyle Drive, which is a contributing element of the bridge property. These alternatives will also cause an indirect impact to the Golden Gate Bridge because it will introduce new visual elements in place of existing contributing elements of the bridge.

These impacts will not result in a substantial adverse change in the Golden Gate Bridge because it will still retain sufficient integrity to convey its historical significance and will remain eligible for the *California Register* and be considered an historical resource under CEQA.

Both the Presidio Parkway and Preferred Alternatives would cause a substantial adverse change to the Marina and Presidio Viaducts of Doyle Drive (determined individually NRHP eligible and are historical resources under CEQA) because the viaducts will be demolished.

Based on available information, the Presidio Parkway and Preferred Alternatives will not have an impact on the Palace of Fine Arts property; however, there are concerns about possible vibration impacts to the buildings and the lagoon. Although the project meets standards for acceptable vibration levels in proximity of fragile historic structures, additional vibration testing and the preparation of a *Historic Structures Report* for the Palace of Fine Arts will be implemented to ensure that the property will not be damaged during construction of the roadway.

The archaeological site, CA-SFR-6/26, will not experience substantial adverse change because the area will be designated as an environmentally sensitive area and protected during construction. Because the large underground parking facility has been eliminated from the Preferred Alternative, potential impacts to unknown archaeological sites will be less than those identified for the Presidio Parkway Alternative in the DEIS/R. If prehistoric or historic period archaeological sites are identified prior to or during construction, then the construction of any build alternative may cause substantial adverse change to the significance of these resources.

This project also requires compliance with *PRC 5024* which requires state agencies to formulate policies to preserve and maintain, when prudent, all state-owned historical resources under its jurisdiction, to give a notice and a summary of the proposed project's effects on state-owned historic properties to the State Historic Preservation Officer (SHPO) for review and comment, and adopt prudent and feasible measures that will eliminate or mitigate the adverse effects. Doyle Drive is a state-owned facility. Caltrans will consult with the SHPO in compliance with *PRC 5024* concurrently with its *Section 106* consultation.

The impacts associated with the Replace and Widen, Presidio Parkway and Preferred Alternatives will result in **unavoidable significant impacts** under CEQA since all build alternatives would require the demolition of the historic Marina and Presidio Viaducts of Doyle Drive. Other historic resources such as the Golden Gate Bridge, Presidio NHL and Palace of Fine Arts will not be adversely impacted and will remain eligible for the *California Register* and be considered an historical resource under CEQA. In addition, none of the build alternatives will impact archaeological site CA-SFR-6/26.

4.2.2 Visual

As outlined in Appendix G of the *CEQA Guidelines*, would the project have a substantial adverse effect on a scenic vista?

Within and around the project area, views of the Golden Gate Bridge, Marina headlands and the bay are accessible, particularly from areas within the Presidio. The existing Doyle Drive facility consists of high- and low-viaducts that currently

obstruct some views of these scenic resources. Under the Replace and Widen Alternative, No-Detour Option the low-viaduct would be raised approximately two meters (six feet), with an almost doubling of the width of the roadway which would result in an **unavoidable significant impact** under CEQA (increased view blockage and visual dominance) primarily when viewed from the Main Post area.

4.2.3 Soils and Geology: Serpentine

As outlined in Appendix G of the *CEQA Guidelines*, would the project result in the loss of availability of locally-important mineral resource delineated on a local general plan, specific plan or other land use plan?

Construction of the Presidio Parkway and Preferred Alternatives will result in removal of a portion of the geologic materials in the bluff area (Serpentine) that comprise a designated resource as defined in the *Presidio Trust Management Plan* (PTMP). In accordance with the criteria established in the PTMP, the removal of these materials is considered an **unavoidable significant impact** under CEQA.

4.2.4 Land Use and Planning

As outlined in Appendix G of the *CEQA Guidelines*, would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect?

All project alternatives will conflict with various aspects of the plans analyzed as part of the project. Specifically, the No-Build Alternative would conflict with elements of the *General Management Plan Amendment* (GMPA), *Presidio Trust Management Plan* (PTMP), *San Francisco General Plan*, and *San Francisco Bay Plan*. The Replace and Widen Alternative would conflict with elements of the GMPA, PTMP, *Vegetation Management Plan* (VMP), and *San Francisco General Plan* while the Presidio Parkway and Preferred Alternatives would conflict with various aspects of the PTMP, VMP, and *San Francisco General Plan*. The conflicts between the alternatives and various planning documents are considered **unavoidable significant impacts** under CEQA.

4.3 Impacts Mitigated to Less than Significant

This section discusses the resources which will experience less than significant impacts as a result of the Doyle Drive Project.

4.3.1 Air Quality

As outlined in Appendix G of the *CEQA Guidelines*, would the project expose sensitive receptors to substantial pollutant concentrations?

Construction activities associated with any build alternative will generate emissions of criteria pollutants over the construction period including suspended and inhalable particulate matter and equipment exhaust emissions. These construction-related emissions will be limited to the construction period but will still cause adverse effects on local air quality during this duration. Incorporation of appropriate mitigation measures will reduce the impacts to a ***less than significant*** level under CEQA.

4.3.2 Biological Resources

For the purpose of this discussion, biological resources include wetlands; candidate, sensitive, or special status species; riparian habitat and other natural communities; and native resident or migratory fish or wildlife.

Wetlands

As outlined in Appendix G of the *CEQA Guidelines*, would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the *Clean Water Act*?

Construction of all build alternatives will permanently remove or temporarily disturb the same amount of Army Corps of Engineers (ACOE) jurisdictional waters of the U.S.: 0.13 hectares or 0.33 acres of permanent impact at wetlands W-2 and W-3, and 0.03 hectares (0.08 acres) of waters temporarily disturbed at Tennessee Hollow and Battery Howe-Wagner.

Each build alternative will also temporarily and permanently affect wetlands protected under *Executive Order 11990* as defined by U.S. Fish and Wildlife Service Cowardin classification system. These impacts would range from a low of 0.01 hectares (0.02 acres) of wetlands temporarily affected by the Replace and Widen Alternative, With Detour Option to a high of 0.08 hectares (0.19 acres) of wetlands permanently removed by the Presidio Parkway and Preferred Alternatives. Through implementation of appropriate mitigation these impacts will be reduced to a ***less than significant*** level under CEQA. (See Avoidance, Minimization, and/or Mitigation Measures in Section 3.4.2 for more information on the mitigation measures to address impacts to wetland resources.)

Areas that are apparently fed by upgradient groundwater flow support wetland communities (i.e., central coast arroyo willow and California blackberry) on the northern bluff face. Construction of the tunnel section of the Presidio Parkway and Preferred Alternatives may potentially result in an indirect impact, disrupting the flow of groundwater in the fractures and potentially increasing or decreasing the flow rate and/or volume of groundwater flow that supports the wetland vegetation growth. If major changes in the character of these areas occurred, these in turn could affect plant communities, and subsequently wildlife habitat on the bluff. Any consideration of the severity of the impact needs to be measured by the magnitude and duration of change. Although mitigation will be incorporated to reduce the impact to ***less than significant*** levels under CEQA,

the impact may be potentially significant depending on the magnitude and duration of change following incorporation of mitigation measures.

There will be no permanent wetland impacts on Tennessee Hollow in its existing condition due to the project build alternatives. However, the existing Tennessee Hollow may be temporarily affected (0.06 hectares [0.15 acres]) if the flow is redirected, the piping is modified, or if discharge enters the stream. Incorporation of appropriate mitigation measures will reduce the impacts to a ***less than significant*** level under CEQA.

Candidate, Sensitive, or Special Status Species

As outlined in Appendix G of the *CEQA Guidelines*, would the project 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?

There will be temporary effects on common vegetation, especially non-native vegetation, due to construction-related activities under the build alternatives. The National Park Service (NPS) and the Presidio Trust consider all native plant communities that are biologically intact and diverse as important (sensitive) natural communities (NPS, 1999a). Construction of the build alternatives may potentially result in some level of temporary disturbances on important plant communities due to possible soil runoff during the rainy season, dust during demolition activities, and other normal construction activities. Mitigation measures will reduce the impacts to a ***less than significant*** level under CEQA.

Construction of all build alternatives may indirectly affect federal special concern plant species in the project study area near the construction corridor. All of the build alternatives may result in direct removal or disturbance to skunkweed, a federal species of local concern, and San Francisco gumplant, a federal species of concern. Both species have been found within the project construction corridor. Incorporation of mitigation measures will reduce the impacts to a ***less than significant*** level.

Riparian Habitat and Other Natural Communities

As outlined in Appendix G of the *CEQA Guidelines*, would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Construction of the build alternatives will result in permanent and temporary effects on important natural upland communities; these are northern coastal scrub on sandy soil, and northern coastal scrub on sandy soil with serpentine inclusions. The permanent impacts on both these vegetation types are relatively minor, although they will be greatest with the Presidio Parkway and Preferred Alternatives. The Replace and Widen Alternative, With Detour Option would take a total of 0.36 hectares (0.90 acres) while the No-Detour Option would take

0.37 hectares (0.93 acres) for permanent impacts to these two types of northern coastal scrub communities; the Presidio Parkway Alternative could affect between 0.40 hectares (0.99 acres) and 0.57 hectares (1.41 acres) of the two types of northern coastal scrub communities depending on design option. The Merchant Road Slip Ramp would disturb an additional 0.10 hectares (0.44 acres) of northern coastal scrub on sandy soil with serpentine inclusions. Total impacts to the two types of northern coastal scrub communities from the Preferred Alternative will be 0.40 hectares (0.99 acres). Temporary impacts for all alternatives on northern coastal scrub will be minimal, ranging from 0.01 hectares (0.02 acres) for the Presidio Parkway and Preferred Alternatives to 0.04 hectares (0.11 acres) for the Replace and Widen Alternative. Impacts to northern coastal scrub with serpentine inclusions show greater variation, ranging from 0.06 hectares (0.16 acres) for the Replace and Widen Alternative to 0.17 hectares (0.43 acres) and to 0.35 hectares (0.87 acres) for the Presidio Parkway and Preferred Alternatives. Incorporation of mitigation measures will reduce the impacts to a *less than significant* level under CEQA.

Native Resident or Migratory Fish or Wildlife

As outlined in Appendix G of the *CEQA Guidelines*, would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors?

Construction of all the build alternatives may potentially result in the disturbance to tree lupine moth (*Grapholita edwardsiana*), and nesting special status raptors and other bird species (including California yellow warbler [*Dendroica petechia brewsteri*]) that are protected by *California Fish and Game Code 3503* and *3503.5*, and the *Migratory Bird Treaty Act* (MBTA). Additionally, construction of all build alternatives may temporarily disrupt a primary segment of the urban wildlife movement corridor, which may result in disturbance to, or direct mortality of, common wildlife species. Impacts on tree lupine moth, common wildlife, and wildlife movement corridor are locally adverse, but considered minor. Potential impacts on nesting birds may be considered adverse if construction occurs in the proximity of nesting birds. Incorporation of mitigation measures would reduce the impacts to a *less than significant* level.

4.3.3 Hydrology

For the purpose of this discussion, hydrology includes water quality and flooding.

Water Quality

As outlined in Appendix G of the *CEQA Guidelines*, would the project violate any water quality standards or waste discharge requirements or would the project 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?

There is the potential that the discharge of dewatering effluent or runoff from any of the proposed alternatives (either during the construction or operation periods) including sediment and/or urban pollutants above allowable regulated thresholds may affect receiving waters. Following proper handling procedures and mitigation measures will reduce the impact to a *less than significant* level under CEQA.

Flooding

As outlined in Appendix G of the *CEQA Guidelines*, would the project expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?

The potential for flooding by tsunami wave run-up and/or extreme high tides may be expected for any roadway or tunnel below 3.2 meters (10.5 feet) North American Vertical Datum (NAVD). Topographic data show the existing surface elevations in the vicinity of the Main Post to be near or below an elevation of 3.35 meters (11 feet) NAVD. Both the Presidio Parkway and Preferred Alternatives will place roadways at or near grade in this area, and therefore, will be susceptible to inundation. Proper design and flood protection for the low portions of the roadway will reduce the impact to a *less than significant* level under CEQA.

4.3.4 Hazardous Waste

As outlined in Appendix G of the *CEQA Guidelines*, would the project 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?

In addition to the known hazardous material sites, based on past uses of the Presidio it is likely that there may be unidentified subsurface contamination from hazardous materials present in the study area that could be encountered during construction activities. Potential impacts are associated with the exposure of construction workers to hazardous materials present in soils and groundwater; exposure to lead and asbestos in building materials; and exposure to naturally-occurring asbestos in bedrock. Implementation of appropriate mitigation measures will reduce the potential impacts to a *less than significant* level under CEQA.

4.3.5 Noise and Vibration

For the purpose of this discussion, noise includes temporary or periodic noise; ground-borne noise and vibration; and excess noise levels.

Temporary or Periodic Noise

As outlined in Appendix G of the *CEQA Guidelines*, would the project cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels?

Temporary noise impacts will occur during construction. The specific construction equipment being used, the construction phase, and the location of construction activity all affect the level and duration of temporary noise impacts. All build alternatives will cause temporary impacts. Occurring over a construction period of four to five years, construction noise will be intermittent, and the level will vary depending on the type, location, and length of the activity. Generally, noise will range from the mid to the upper 80s dBA at receptors within 30 meters (100 feet) of the project construction limits. Construction equipment will operate in a limited area then move along the alignment until the completion of the phase. Temporary noise will affect noise-sensitive areas, including residences along Richardson Avenue and Marina Boulevard, Crissy Field Marsh and the Crissy Field Center. With incorporation of appropriate construction mitigation measures, the temporary construction noise impacts will be reduced to a *less than significant* level under CEQA.

Ground-Borne Noise and Vibration

As outlined in Appendix G of the *CEQA Guidelines*, would the project result in the exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

The equipment used to construct the build alternatives will cause temporary vibration impacts in the project area. Among the build alternatives, the Presidio Parkway and Preferred Alternatives will have the greatest increase on vibration levels felt in the areas south of Doyle Drive, such as the Main Post, because they shift the road alignment towards the south, and require more work on roads other than Doyle Drive in the study area, particularly near the east end of the project. Nonetheless, with incorporation of appropriate vibration management measures, the risk of structural damage to the historical buildings will be reduced to a *less than significant* level.

Excess Noise Levels

As outlined in Appendix G of the *CEQA Guidelines*, would the project result in the 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?

Noise analysis indicated that noise generated by vehicle traffic would exceed the Federal Highway Administration (FHWA) *Noise Abatement Criterion* (NAC) at thirty-seven receptor locations under one or more of the future modeled conditions resulting in noise impacts to these receptors. With the incorporation of appropriate mitigation, the exposure of persons to noise levels in excess of the FHWA NAC will be *less than significant* under CEQA.

4.3.6 Visual/Aesthetics

As outlined in Appendix G of the *CEQA Guidelines*, would the project substantially degrade the existing visual character or quality of the site and its surroundings?

During the four to five year construction period, all build alternatives will result in a substantial change in the visual character of the study area. All build alternatives will require the removal of substantial amounts of existing landscaping and vegetation during construction, resulting in a substantial negative visual impact. The Replace and Widen Alternative, With Detour Option would also require the construction of a detour road and structure north of the existing Doyle Drive alignment to re-route traffic around construction areas. The temporary visual impacts can be reduced to a *less than significant* level under CEQA with the incorporation of mitigation.

4.3.7 Geology and Soils: Seismic

As outlined in Appendix G of the *CEQA Guidelines*, would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking or seismic-related ground failure, including liquefaction? Or would the project 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?

All alternatives will be susceptible to strong seismic ground shaking and the potential for seismic-related ground failure. Additionally, each alternative is located in an area that is susceptible to liquefaction. Design features associated with all build alternatives will minimize the impacts to a *less than significant* level under CEQA.

4.4 No Impacts

The Doyle Drive Project will have no significant impacts under CEQA to the areas of farmland, population and housing, public services, recreation, and utility and service systems. Through implementation of the *Transportation Management Plan* prepared as part of this project, there will be no significant transportation/traffic related impacts.

4.4.1 Climate Change

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 gas¹ (GHG) emissions reduction and climate change research and

¹ Greenhouse gases related to human activity include: Carbon dioxide, Methane, Nitrous oxide, Tetrafluoromethane, Hexafluoroethane, Sulfur hexafluoride, HFC-23, HFC-134a*, and HFC-152a*

policy have increased dramatically in recent years. In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires the Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions; these regulations will apply to automobiles and light trucks beginning with the 2009 model 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 ARB 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.

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.

According to a recent white paper by the Association of Environmental Professionals "An individual project does not generate enough greenhouse gas emissions to significantly influence global climate change; therefore, the issue of global climate change is by definition a cumulative impact."²

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, Caltrans has created and is implementing the *Climate Action Program at Caltrans* (December 2006).

One of the main strategies in the 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 (0-25 miles per hour) and speeds over 55 mph. Relieving

² Michael Hendrix and Cori Wilson, "Alternative Approaches to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents," Association of Environmental Professionals, April 27, 2007.

congestion by enhancing operations and improving travel times in high congestion travel corridors will lead to an overall reduction in GHG emissions. “

Caltrans recognizes the concern that carbon dioxide emissions raise for climate change. However, modeling and gauging the impacts associated with an increase in GHG emissions levels, including carbon dioxide, at the project level is not currently possible. No federal, state or regional regulatory agency has provided methodology or criteria for GHG emission and climate change impact analysis. Therefore, Caltrans is unable to provide a scientific or regulatory based conclusion regarding whether the project’s contribution to climate change is cumulatively considerable

4.5 Environmentally Superior Alternative

CEQA Guidelines (Section 15126.6(e)(2)) require that an environmentally superior alternative be identified among the alternatives considered. The environmentally superior alternative is generally defined as the alternative which would result in the least adverse environmental impacts to the project site and surrounding area. If the No-Project (No-Build) Alternative is found to be the environmentally superior alternative, the document must identify an environmentally superior alternative among the other alternatives.

The No-Build Alternative would best avoid impacts as compared to the proposed build alternatives; and hence, it is the environmentally superior alternative. Although the No-Build Alternative would not result in any physical impacts to the environment, it would fail to meet the purpose and need of the project. The No-Build Alternative would fail to provide the long-term seismic, structural and traffic benefits associated with replacing Doyle Drive and would therefore not be considered an environmentally superior alternative in the long-term.

Each build alternative meets the purpose of the project and the overall impacts associated with each are similar. The main differences in impacts between the Replace and Widen Alternative, Presidio Parkway Alternative, and Preferred Alternative can be found in the areas of visual resources, vehicular access to the Presidio, roadway runoff and pollutant loading, wetlands, geology and soils, land use, and historic features.

Visually the Presidio Parkway Alternative and Preferred Alternative will provide improved views from within the Presidio, while the Replace and Widen Alternative would continue to obstruct views that are currently blocked by the existing roadway. The Replace and Widen Alternative, No-Detour Option would raise the low-viaduct approximately two meters (six feet) which would increase the view blockage and visual dominance of the structure.

Vehicular access to the Presidio differs for the Replace and Widen Alternative, Presidio Parkway Alternative, and Preferred Alternative. Access for the Replace and Widen Alternative is available from Doyle Drive via the on- and off-ramps

to Merchant Road at the Golden Gate Bridge Toll Plaza and via a right turn from southbound Richardson Avenue to Gorgas Avenue. Under the Replace and Widen Alternative, the existing slip ramp providing access to the Presidio from northbound Richardson Avenue would be removed. Therefore, there would be no Presidio access for northbound traffic at the east end of Doyle Drive due to geometric constraints and concerns for traffic safety.

The Presidio Parkway Alternative offers better access to the Presidio, including two options for direct access to the Presidio and Marina Boulevard at the eastern end of the project (Diamond Option or Circle Drive Option). In addition, the alternative includes an option for providing access to the Presidio via a direct connection from northbound Doyle Drive to Lincoln Avenue which would avoid the Toll Plaza.

Additionally, the Presidio Parkway Alternative would reconfigure Palace Drive so that it directly intersects with Richardson Avenue and operates as a one-way street in the northbound direction. Palace Drive would no longer connect to Lyon Street; rather Lyon Street would become one-way from Richardson Avenue and connect to Bay Street. This redesign would be inconsistent with the proposed entry dropoff/turnarounds at the north and south ends of Palace Drive that are being examined by the city and county of San Francisco Recreation and Parks Department as part of the Palace of Fine Arts rehabilitation efforts.

Similar to the Presidio Parkway Alternative, the Preferred Alternative will provide direct access to the Presidio and indirect access to Marina Boulevard in both directions via access ramps from Doyle Drive connecting to an extension of Girard Road. Palace Drive will not be affected by the Preferred Alternative. It will be maintained as a two-way road and incorporate the modifications proposed by the San Francisco Department of Recreation and Parks for the north and south connections with Lyon Street.

The Presidio Parkway and Preferred Alternatives will result in the reduction of total runoff volume and would also likely result in a reduction of pollutant loading associated with the roadway (relative to the No-Build and Replace and Widen Alternatives since approximately twenty-five percent of the roadway under the Parkway Alternative would be in tunnel segments and therefore not subject to storm water runoff.³)

All build alternatives will result in impacts to both jurisdictional and Cowardian wetlands. The total amount of permanent impacts will be slightly greater under the Presidio Parkway and Preferred Alternatives [0.21 hectares (0.52 acres)] compared to the Replace and Widen Alternative [0.20 hectares (0.50 acres)]. In addition, the construction of the tunnel section of the Presidio Parkway and

³This assumes that any residual water collected within the tunnel during storms or during washdown activities is contained.

Preferred Alternatives could disrupt groundwater flow in the bluff region which will potentially result in indirect impacts to wetland vegetation growth in the area.

None of the build alternatives will affect state or federal threatened or endangered animal species although each alternative would cause the loss of minor amounts of wildlife habitat. The Presidio Parkway Alternative and Preferred Alternative will permanently remove or damage 5.07 hectares (12.54 acres) of non-native vegetation including non-native forest and ornamental wildlife habitat. The Replace and Widen, With Detour Option would impact 2.37 hectares (5.86 acres) of non-native vegetation.

The Presidio Parkway and Preferred Alternatives will impact geological materials which are a designated resource. Construction of the tunnel segments will require the removal of these designated geologic materials. The Replace and Widen Alternative would not impact these designated resources.

All build alternatives will conflict with specific development plans of various PTMP planning areas. The Replace and Widen Alternative would require the removal of approximately 380 square meters (4,000 square feet) of building space in the Letterman planning area with the No-Detour Option. The Replace and Widen Alternative, With Detour Option would require the permanent removal of approximately 13,200 square meters (142,100 square feet) of building space from the Crissy Field planning area. The Presidio Parkway Alternative would require the maximum removal of almost 10,600 square meters (114,100 square feet) of building space with the Circle Drive and Merchant Road Slip Ramp Options. The building removal would be required in the Crissy Field, Letterman, Main Post and Fort Scott planning areas. The Preferred Alternative will require the permanent removal of approximately 8,590 square meters (92,490 square feet) of building space from the Crissy Field, Main Post and Letterman planning areas. The land use development plans identified in the PTMP call for an increase in building space in each of the identified planning areas; therefore, the removal of building space from these areas will be in conflict the proposed land use goals of the PTMP.

The additional land area required for implementation of each build alternative would also differ. This is the total amount of land that will be required in addition to the existing roadway easement. The Presidio Parkway Alternative would require the greatest amount of land which would vary depending on the design options. The Diamond Option with the Loop Ramp would require a total of 4.6 hectares (11.4 acres), while the Hook Ramp would require 4.1 hectares (10.1 acres). The Circle Drive Option with the Loop Ramp would require a total of 4.5 hectares (11.1 acres), while the Hook Ramp would require 3.9 hectares (9.6 acres). The Merchant Ramp would require an additional 0.5 hectares (1.2 acres) of land. The majority of land to be converted to a transportation use is in areas currently designated as open space/natural. The Preferred Alternative will require 2.6 hectares (6.4 acres) of land for permanent roadway easements. The Replace and Widen Alternative would require the conversion of an additional 0.9 hectares (2.2 acres) of land along the Doyle Drive corridor for the No-Detour

Option and 0.6 hectares (1.5 acres) of land for the With Detour Option for permanent roadways easements.

The total number of historic elements affected would vary between the different design options of the build alternatives. The greatest number of impacts will be associated with the Preferred Alternative which would adversely affect 17 historic elements. The Presidio Parkway Alternative would affect up to 15 elements depending on the design option while the Replace and Widen Alternative, With Detour Option would adversely affect nine elements. As a result of the impacts to the contributing elements, each build alternative will cause a direct adverse effect to the Presidio National Historic Landmark District.

Based on a quantitative analysis of impacts presented in this document it can be determined the Replace and Widen Alternative, No-Detour Option would have the fewest environmental impacts and would therefore be considered the environmentally superior alternative.

Determination of the environmentally superior alternative does not preclude the other alternatives from being selected. The lead agency may adopt a statement of overriding considerations which expresses the agency's views on the merits of approving a project despite its significant adverse environmental impacts. The statement of overriding considerations provides the justification for proceeding with a project despite its environmental impacts. The statement reflects the balancing of competing public objectives including factors such as environmental concerns, legal issues, technical, social, and economic factors. Since the San Francisco County Transportation Authority selected an alternative other than the environmentally superior option, a statement of overriding considerations will be provided as part of the certification of this FEIR.

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CHAPTER FIVE

CUMULATIVE IMPACTS ANALYSIS

The Council on Environmental Quality (CEQ) identifies the impacts that must be addressed and considered by federal agencies in satisfying the requirements of the *National Environmental Policy Act* (NEPA). This includes permanent, temporary, indirect, and cumulative impacts. The purpose of this chapter is to provide an analysis of the cumulative impacts (also known as a cumulative effects analysis) anticipated as a result of this Doyle Drive Project.

A cumulative effects analysis is intended to describe the sum total of all impacts to a particular resource that have occurred, are occurring, and will likely occur as a result of any action or influence, including the direct and reasonably foreseeable indirect effects of the proposed action.

Cumulative impacts can be positive as well as negative depending on the environmental resource (e.g., air quality, wetlands, etc.) being evaluated. It is possible that some environmental resources can be negatively and others positively affected by the same proposed project. Most cumulative effects analyses identify varying levels of beneficial and adverse effects depending on the environmental resources and the specific actions. Because of this potential mixture of effects, it is sometimes difficult to determine which alternative is best.

5.1 Guidance

This analysis follows guidance from the CEQ, the Federal Highway Administration (FHWA) and the implementing regulations of the *California Environmental Quality Act* (CEQA). Brief discussions of CEQ, FHWA, and CEQA guidance follow.

5.1.1 Council on Environmental Quality

CEQ regulations implementing the procedural provisions of NEPA define cumulative effects as:

The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

The cumulative effects of an action may be undetectable when viewed in the individual context of general impacts, but they can add to other disturbances and eventually lead to a measurable environmental change. Cumulative effects should be evaluated along with the overall impacts analysis of each alternative. The range of alternatives considered should include the No-Build Alternative as a baseline against which cumulative effects are evaluated. The range of actions

to be considered include not only the proposed project but all connected and similar actions that could contribute to cumulative effects.

Related actions should be addressed in the same analysis. CEQ recommends that an agency's analysis accomplish the following:

- Focus on the effects and resources within the context of the proposed action.
- Present a concise list of issues that have relevance to the anticipated effects of the proposed action or eventual decision.
- Reach conclusions based on the best available data at the time of the analysis.
- Rely on information from other agencies and organizations on reasonably foreseeable projects or activities that are beyond the scope of the analyzing agencies purview.
- Relate to the geographic scope of the proposed project.
- Relate to the temporal period (time frame) of the proposed project.

A cumulative effects analysis involves assumptions and uncertainties. Monitoring programs and/or research can be identified to improve the available information and, thus, the analyses in the future. The absence of an ideal database should not prevent the completion of a cumulative effects analysis.

5.1.2 Federal Highway Administration

FHWA environmental regulations do not explicitly address cumulative effects. However, FHWA policy is provided in a memorandum and associated position paper¹ dated August 20, 1992, and a memorandum² dated January 31, 2003. The January 31, 2003, memorandum states:

“An appropriately thorough review of the probable direct and indirect impacts of FHWA actions and documentation of other cumulative effects on specific resources is essential to a reasoned and informed project decision and will assist in attaining FHWA’s environmental streamlining and stewardship goals.”

Per FHWA guidance, cumulative effects analysis is resource-specific and generally performed for the environmental resources directly affected by the action. However, not all of the environmental resources directly affected by a project will require a cumulative effects analysis. The environmental resources subject to cumulative effects analysis should be determined on a case-by-case basis early in the NEPA process, generally as part of early coordination or scoping.

¹ Position Paper on Secondary/Cumulative Impact Assessment in the Highway Development Process.

² Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process.

5.1.3 California Environmental Quality Act

CEQA Guidelines provide:

that the lead agency identify reasonably foreseeable projects in the vicinity of the proposed project, summarize their effects, identify the contribution of the proposed project to cumulative impacts in the project region, and recommend feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects (CEQA Guidelines Section 15130 [b][3]).

5.2 Scope and Methodology of the Cumulative Impacts Analysis

In March 2004, as part of an interdisciplinary team, Caltrans, together with FHWA and EPA staff, prepared a preliminary guidance paper entitled *Guidance for Preparers of Indirect and Cumulative Impact Assessment Methods for Analyzing Effects*. The cumulative impacts analysis for the Doyle Drive Project was conducted in a series of steps based on this preliminary guidance.

The following steps were followed for this analysis:

- Identify the environmental and community resources that warrant a cumulative impacts analysis.
- Define the geographic boundaries for each resource area.
- Define the timeframe (temporal boundary) for analysis for each resource area.
- Identify past actions and present and reasonably foreseeable future projects that would affect that resource.
- Identify the impacts (or benefits) to the resource from the other projects.
- Determine: 1) whether there currently is a cumulative impact to the resource area; and, 2) whether the impacts from the Doyle Drive Project would contribute to that impact.

Following preparation of the cumulative impacts analysis for the Doyle Drive Project, Caltrans' *Guidance for Preparers of Cumulative Impacts Analysis* (July 2005) was released. The analysis presented in this chapter is consistent with the eight steps presented in the July 2005 guidance. Since the analysis is consistent with the new guidance the conclusions presented in this cumulative impacts analysis do not change.

5.3 Resources Evaluated

Cumulative effects were evaluated for other projects or activities such as major infrastructure projects, community development improvements, or private developments that are geographically related to the Doyle Drive Project.

Reliance was placed on written correspondence from agencies and planning officials, interview notes, and meeting reports. For a resource area to be considered for this cumulative impacts analysis, the resource element must have been projected to experience a measurable impact and/or effect due to the Doyle Drive Project. Listed below are the resource elements that were identified for this cumulative analysis:

- Traffic and Transportation;
- Biological Environment;
- Hydrology, Water Quality, and Stormwater Runoff;
- Cultural Resources; and
- Visual Quality.

5.4 Temporal and Geographic Boundaries

When evaluating cumulative effects, the analyst must consider expanding the geographic study area beyond that of the proposed project, as well as expanding the temporal (time) limits to consider past, present, and future actions that may affect the environmental resources of concern. The temporal and geographic boundaries can be different for each environmental resource evaluated.

The geographic scope of analysis includes the physical limits or boundaries of environmental resources studied for this project, as well as the boundaries of other projects or activities that also may contribute to the effects on an environmental resource.

5.4.1 Temporal

A timeframe extending from 1998 through 2030 was used for all five environmental resources (traffic and transportation, biological environment, hydrology, cultural, and visual) analyzed. Using 1998 as the starting point for the analysis allowed an assessment of the changes that have occurred since the Presidio was turned over to the National Park Service and the Presidio Trust. The year 2030 is the future year used in regional transportation planning documents and the traffic analysis for this environmental document.

5.4.2 Geographic

The geographic boundaries for the hydrology, cultural, and visual resources were the Presidio and the immediate surrounding area. However, for traffic and transportation and the biological environment, the geographic study area was broadened to include locations which could still impact the biological and transportation systems within the region.

5.5 Other Projects and Plans Considered in this Analysis

Future projects, within the identified geographic boundaries, were included in the cumulative effects analysis if they were planned, approved, and funded. In some instances, if a specific project was not funded, but would have a substantial impact on the study area if implemented, the project was also considered in this analysis. All or a portion of the projects had to be located within the cumulative effects geographic study boundaries. The projects also had to be initiated before 2030. Effects from these projects were evaluated because they could result in cumulative effects on the critical resources.

The cumulative effects analysis considers the impacts to the community and the environment caused by the Doyle Drive Project in combination with other projects in the area including those in Marin County, the city of San Francisco, and the Presidio. The transportation projects and other development projects which were considered in this analysis are summarized below.

Letterman Digital Arts Center – completed (summer 2005)

The Letterman Digital Arts Center is located on a 9.3 hectare (23 acre) site in the eastern portion of the Letterman District near the Lombard Gate. The Letterman Digital Arts Center provides a large, public open space at Lyon and Lombard Streets, offering opportunities for passive recreation and pedestrian access, including a new gateway at the intersection of Lyon Street and Chestnut Street. Parking is provided underground.

Presidio Transit Center – completed (2007)

The Presidio Transit Center was designed to improve access to the Presidio and provide clear information to visitors. It is located on the Main Post near the Presidio Fire Station, and provides a central location where MUNI busses, the PresidiGo Free Shuttle, and other transit services can converge.

A new building that is architecturally compatible with the setting was constructed. The new facility also includes covered bus waiting areas, public restrooms, retail space, and secure bicycle parking.

Presidio Water Recycling Project – planning and environmental document prepared March 2002; construction planned for 2008

The Presidio Water Recycling Project will construct a small (500,000 gallons per day) water recycling system (located within an existing Presidio building in the Letterman District) and corresponding system components, including delivery pipelines and recycled water storage. The proposed water recycling plant will treat wastewater generated at the park to comply with water quality. The first phase will allow for a maximum treatment capacity of 200,000 gallons per day and will serve Crissy Field and the Letterman Digital Arts Center site.

Crissy Marsh Expansion – preliminary planning on-going

The *Marsh Study* will identify a broad array of options for ensuring the long-term viability of Crissy Marsh and discuss the benefits, costs, impacts, conflicts, and trade-offs associated with each option. The *Study* will provide information to select options to move forward for further study. Although there is no approved plan for this project, its prominence in Presidio planning efforts warrants its consideration in relation to the Doyle Drive Project.

Crissy Field Project – completed (2000)

The Crissy Field Project transformed a 40.5 hectare (100 acre) area of asphalt into a shoreline national park through a unique partnership among public, private, and philanthropic sectors. The Golden Gate Promenade at Crissy Field, part of the 400-mile San Francisco Bay Trail system, is a multi-use trail that is an important corridor between San Francisco and the Golden Gate Bridge. Secondary pathways adjacent to Mason Street provide alternate routes through the project area for bicycles and pedestrians. Principal features of the project are an 11.3 hectare (28 acre) grassy field representing the historic Crissy airfield, a sheltered picnic area, a tidal marsh and the Crissy Field Center (a community environmental center).

Tennessee Hollow Restoration – preliminary planning on-going

In fall 2001, the Trust initiated planning to restore surface drainage and native riparian habitat along the three natural drainages in Tennessee Hollow, including El Polin Spring. Restoration will expand riparian habitats and allow for an integrated system of freshwater streams and freshwater, brackish and tidal marsh, reestablishing a connection to Crissy Marsh. This project will also entail the improvement of management practices in the surrounding watershed; the protection of cultural and archaeological resources; and the improvement of recreational, educational and interpretive opportunities.

Building Rehabilitation in the Presidio – on-going

The Presidio is a National Historic Landmark District, with 780 distinct contributing features, including 469 historic buildings, constructed primarily by the U.S. Army from the Civil War through World War II.

A critical aspect of the Presidio Trust's mission is to preserve these structures and restore them to active use. The Trust and its partners are now engaged in the process of rehabilitating or restoring these facilities which include residential units, and buildings to serve businesses, non-profit organizations and park users.

Rehabilitation of the Palace of Fine Arts – on-going

The San Francisco Recreation & Park Department, in partnership with the non-profit Maybeck Foundation, is undertaking a 22 million dollar restoration of the Palace of Fine Arts. The restoration project is being done in four phases as follows:

1. Phase I — Rotunda Roof Repair – completed;
2. Phase IIA — Lagoon and Park (East Landscape) Restoration - under construction;
3. Phase IIB — Buildings and Park (West Landscape) Restoration - project is in Design Phase with construction scheduled to start summer 2006; and
4. Phase III — Peristyle - project in planning phase.

San Francisco – Oakland Bay Bridge: East Span Seismic Safety Retrofit and Project – currently under construction

Following the Loma Prieta earthquake, Caltrans initiated a seismic retrofit program of area structures and bridges, including the six major bridges in the Bay Area. Retrofit projects for the San Francisco-Oakland Bay Bridge include seismic strengthening of the west span (from San Francisco to Yerba Buena Island) and construction of a new east span (from Yerba Buena Island to the Oakland touchdown). An interim retrofit of the existing east span has been completed.

Golden Gate Bridge Seismic Retrofit – on-going

The Seismic Retrofit is divided into three phases. Phase I, now completed, is the retrofit of the north abutment of the bridge. Phase II, which began in the summer of 2001, will retrofit the southern abutment of the bridge. Phase II also requires heavy truck traffic on existing roads and trails, and possible use of trails as staging areas. Trail routes through and to the area may need to be relocated temporarily to reduce vehicle, pedestrian and bicycle conflicts. During construction of this project, bicycles and pedestrians share Battery East Road and Marine/Long Drives with construction trucks. Phase III consists of superstructure strengthening, including reinforcement of the main cable saddles, the steel tower shafts and the addition of dampers between the towers and the roadway trusses. Phase III has not yet been implemented.

Golden Gate Bridge Movable Median Barrier – on-going

This project entails the design and construction of movable barriers, including a cushioning system at the Toll Plaza.

Highway 101 Widening, Interchange and HOV Projects – on-going

The project will close the gap in the high occupancy vehicle (HOV) lane system between the Richardson Bay Bridge and Route 37. Completion of the HOV lane system will reduce the traffic delay during peak traffic periods for HOV lane and mixed-flow lane travelers; encourage the use of buses, vanpools and carpools; enhance existing intermodal transportation options; and add mixed-flow lane capacity during off-peak periods.

Octavia Boulevard Project – completed (September 2005)

The intent of the new boulevard is to provide a smooth transition of vehicular travel from local streets to arterials, and from those arterials to the remaining portion of the elevated new Central Freeway (which was also completed in September 2005). The boulevard was widened to a four lane two-way roadway separated by a central median, and flanked on either side by a one-way street with on-street parallel parking. Within the medians, roadway, and sidewalks, improvements such as new light fixtures, tree plantings, benches, trash receptacles, and traffic signals were installed.

Fort Baker Project – preliminary planning

The proposed plan includes creation of a conference and retreat center at Fort Baker, and includes programs to conserve natural and historic features. The center will be housed in the historic buildings around the parade ground and in the adjacent nonhistoric residential area. A new building of compatible character will be constructed to provide adequate space for meetings, dining and accommodations. The center, under the jurisdiction of the NPS, will be financed and managed by one or more private operators selected through a competitive bid process.

Presidio Environmental Remediation Program (Presidio Trust) – on-going

Pursuant to a 1999 agreement with the U.S. Army and the National Park Service, the Presidio Trust is cleaning up hazardous materials contamination from prior military uses at the Presidio. Clean-up sites include landfills and areas contaminated with petroleum products. The Trust intends to complete the clean-up program in ten years, with Area A of the Presidio cleaned up in four years. Remediation will be followed by revegetation in conformance with the *Vegetation Management Plan (VMP)*.

Merchant Road Realignment (Presidio Trust) – on-going planning and design

This project is located near the Golden Gate Bridge Toll Plaza. It will relocate the intersection of Merchant Road and Lincoln Boulevard to connect with Storey Avenue in the Presidio.

Public Health Service Hospital (Presidio Trust) – on-going planning and design

The Presidio Trust is engaged in a public process to consider the future of the Public Health Service Hospital buildings, located between Mountain Lake and Lobos Creek Valley on the park's southern border. The large former hospital and the dormitories, offices, and recreational buildings were once a medical complex serving merchant seamen. Most have been empty for more than two decades.

Main Post Parade Ground (Presidio Trust) – on-going planning and design

The Main Post is the “heart of the Presidio.” At its core is a six acre central parade ground that was once used for military drills, troop exercises, and public

ceremonies. For the last several decades this property has been used as a surface parking lot. The Presidio Trust is now re-establishing the Main Parade Ground as a gathering place for park visitors, residents, and employees. In June 2008, the Presidio Trust released its draft updated plan for the Main Post and *Draft Supplemental Environmental Impact Statement* which outline ideas for sharing the Presidio's history and establishing new ways to use and enjoy the Main Post area. The public comment period for this document extends through October 20, 2008.

Golden Gate Bridge District Remediation, Phase II (Golden Gate Bridge Highway and Transportation District) – on-going

Remediation of contaminated soils below the Golden Gate Bridge is occurring as a two-phase project. Phase I, now completed, focused on cleanup of contamination in areas directly below the bridge where safe access was needed for construction crews working on the Golden Gate Bridge Seismic Retrofit Project. Affected areas include Battery East and popular vista areas near the bridge. Phase II will continue to investigate contaminated soils to determine where remediation is required. The Phase II planning horizon is approximately five years.

This cumulative assessment considers the potential for the Doyle Drive Project, in combination with the projects listed above, to have impacts on the environment of the Presidio and surrounding area.

5.6 Cumulative Impacts Evaluation

First the direct effects (impacts) on the critical resources caused by the Doyle Drive Project were identified from the technical reports for each of those subjects. Indirect effects resulting from the direct effects on the critical resources were then estimated. Similar information, where possible, was gathered from available sources for each of the projects (listed above) included in the cumulative effects analysis. If impacts information was not available, professional judgment was utilized and general assumptions were made. Finally, the effects were re-examined in combination with each other to estimate the cumulative effect on each critical environmental resource.

5.6.1 Traffic and Transportation

Doyle Drive is part of a roadway network which provides access in and out of the city of San Francisco. The Golden Gate Bridge, including U.S. Highway 101, Route 280, Route 80, Highway 1, and the San Francisco-Oakland Bay Bridge are also part of this system. The most recent *2030 Regional Transportation Plan for the San Francisco Bay Area* (Metropolitan Transportation Commission, 2005) lists several ongoing projects on these facilities (the larger, projects are discussed earlier in this chapter) over the next several years that could affect traffic operations.

During the construction period, delays associated with other projects could result in a cumulative effect of increased traffic delay in terms of access into the City. These delays will be considered temporary. The potential for increased delay and congestion will depend on the timing of construction activities associated with each project, the amount of traffic diversion from these facilities to Doyle Drive, and measures that will be implemented to eliminate or reduce potential impacts such as public awareness campaigns and increased transit service.

A draft *Transportation Management Plan* (TMP) has been prepared and will be developed in greater detail prior to construction of the Doyle Drive Project. In the event of a weekend closure of the facility during construction, mitigation funds may be provided to the Golden Gate Bridge, Highway and Transportation District to provide additional ferry service to accommodate the additional need. However, the details of the TMP will not be finalized until construction of the Doyle Drive Project is imminent.

Once constructed, long-term cumulative impacts are not expected. The long-term baseline traffic conditions (2030 No-Build) in the Doyle Drive Project study area were analyzed using the travel demand forecasting model that was developed by the City and the San Francisco County Transportation Authority (the Authority). Future conditions in this model included all known past, present, and future projects identified in the draft *Presidio Transportation Improvement Plan*. Therefore, the Doyle Drive Project was analyzed in the context of long-range traffic conditions for the San Francisco Bay Area. As such, the baseline future forecast actually presents cumulative transportation effects. Overall, the Project will result in a benefit or little change to long-term traffic conditions in the region.

5.6.2 Biological Environment

Projects that will have a net local, long-term, beneficial cumulative effect on biological resources include those that will protect, enhance or expand biological resources in the Presidio. These projects include the Crissy Field Marsh Project and the Tennessee Hollow Riparian Corridor Enhancement Project.

The implementation of the Crissy Field Marsh Project has transformed 40 hectares (100 acres) of asphalt surrounded by chain link fence to a restored dune and tidal marsh system, and increased habitat as well as diversity of plant and wildlife species. In addition, a *Crissy Field Marsh Feasibility Study* is currently underway. If this study identifies priority areas within the Presidio Trust's jurisdiction critical to ensuring the health of the marsh, the Trust will ensure that the Crissy Field planning efforts are completed and implemented in a timely manner. These efforts will result in increased species richness, the reintroduction and expansion of endangered species populations, and a net increase in habitat for native communities and wetland systems.

The Tennessee Hollow Riparian Corridor Enhancement Project will connect to the expanded Crissy Field tidal marsh and will restore Tennessee Hollow,

including its three main tributaries, as well as native riparian habitat that will be suitable for nesting avian species.

The Presidio Environmental Remediation Actions will result in short-term adverse effects on special-status species. However, the beneficial effects in the long-term due to increased habitat for special-status species will outweigh adverse effects of these actions. Implementation of *U.S. Fish and Wildlife Service Recovery Plans* will have short-term construction-related impacts on special-status species, including San Francisco lessingia, but the long-term benefits to listed plant species of those plans will outweigh any adverse short-term effects.

The Replace and Widen Alternative coupled with the other projects in the study area would result in temporary and long-term effects on biological resources, primarily on important plant communities, Army Corps of Engineers (USACE) jurisdictional waters of the U.S., Cowardin wetlands under protection of the National Park Service (NPS) or the Presidio Trust, and nesting bird species. These cumulative effects would contribute cumulatively to non-listed special-status plant and animal species, native plant community and jurisdictional wetland impacts at the Presidio. The cumulative benefits of restoration projects in historically disturbed and existing disturbed areas would outweigh the adverse effects of project construction activities under the Replace and Widen Alternative on biological resources.

The Presidio Parkway and Preferred Alternatives share some of the impacts described above for the Replace and Widen Alternative. These alternatives also include underground (tunnel) segments with possible indirect effects on hydrology. The long-term benefits of cumulative restoration of historically disturbed and existing disturbed areas proposed under the Presidio plans and projects will reduce the effects on biological resources. For all build alternatives, implementation of mitigation will reduce adverse effects of the Doyle Drive Project, and will thus reduce cumulative impacts on non-listed special-status plant and animal species, native plant communities, and jurisdictional wetlands. Overall, the cumulative impacts may provide a beneficial effect on the study area.

5.6.3 Hydrology, Water Quality, and Stormwater Runoff

The combination of the Doyle Drive Project and other proposed projects, including the restoration of Tennessee Hollow, the Presidio Water Recycling Project, and projects associated with various alternatives of the *General Management Plan Amendment (GMPA)* and the *Presidio Trust Management Plan (PTMP)*, will almost certainly have an overall net benefit to surface water quality conditions and improved watershed function due to the decrease in impervious surface area as identified in the PTMP that will be associated with these projects.

Along the Doyle Drive roadway corridor, however, there is the potential for an overall increase in impervious surface area if the Replace and Widen Alternative were to be selected. The increase in impervious surface under the Replace and Widen Alternative would lead to an increase in runoff. Through the increased

runoff, there is the potential for the transport of greater quantities of pollutant loads to the Bay leading to a cumulative impact to the overall water quality of the Bay. However, the Presidio Parkway and Preferred Alternatives will result in a net decrease in impervious cover because much of the roadway will be underground in a tunnel and not exposed to rainfall and runoff. The Presidio Parkway and Preferred Alternatives will provide a net benefit related to reduced runoff volumes.

Under any of the build alternatives, stormwater quality improvement measures, referred to as *best management practices* (BMPs) will be required for the Doyle Drive Project. These BMPs will treat the runoff prior to discharge to the maximum extent practicable. Under the existing conditions, runoff from the Doyle Drive structure drains to the surrounding lands and creeks without any treatment.

Given the requirement for BMPs for the build alternatives, as well as the decrease in impervious surfaces in the extended study area (for the Presidio Parkway and Preferred Alternatives), there will be an overall cumulative beneficial effect to surface water quality to area creeks and the San Francisco Bay if the project were to be implemented.

No cumulative impacts to flooding or groundwater resources are anticipated. Cumulative impacts associated with construction dewatering, or construction-period runoff water quality are not anticipated.

5.6.4 Cultural Resources

The regulatory context for assessing cumulative impacts to cultural resources is *Section 106* of the *National Historic Preservation Act* (see section 3.2.11). This cumulative impacts section analyzes the potential for cumulative impacts to the six historic properties, including the Presidio National Historic Landmark District (NHLD), the Marina and Presidio Viaducts of Doyle Drive, the Golden Gate Bridge, the Palace of Fine Arts, and archaeological site CA-SFR 6/26.

Other than the Doyle Drive Project, plans which identify land use concepts for the Presidio and could affect contributing elements to the NHLD are the *General Management Plan Amendment* (GMPA), and the *Presidio Trust Management Plan* (PTMP). These plans include projects that will demolish a number of historic structures, and could adversely affect other historic structures that contribute to the NHLD. They also include components that will enhance some cultural landscapes and rehabilitate some historic structures. Overall, the Doyle Drive Project, in conjunction with the other projects noted above, will have a cumulative impact on historic resources.

In addition to the projects identified earlier in this chapter, other Presidio projects were also considered in combination with each of the build alternatives to capture potential cumulative effects:

- Historic Building Restoration, Presidio NHLD – on-going
- Construction of Trails and Scenic Overlooks, Presidio NHLD – on-going

- Management of Natural Areas and Wildlife, Presidio NHLD – on-going
- Management of the Historic Forest, Presidio NHLD – on-going
- Management of Designed Landscapes, Presidio NHLD – on-going.

For this analysis, these known past, present, and future undertakings have been considered in conjunction with adverse effects identified in this document for the build alternatives, as well as compared to the existing conditions on the Presidio as described in the 1993 updated documentation of the Presidio NHLD. Since the 1993 inventory, 39 buildings and structures that were contributors to the Presidio NHLD, and which would have been located within the Focused Area of Potential Effect (APE), have been removed. These contributors were primarily located in the east and west ends of the Crissy Field Planning District and were demolished to accommodate the rehabilitation of Crissy Marsh. A few buildings were also removed from the Crissy Field and Letterman Planning Districts during other projects.

The 39 buildings and structures removed from these areas since 1993 dated to the twentieth century, and most were built just before or during the first years of World War II (circa 1940 to 1942). These buildings and structures (including the railroad line) were identified as contributing elements of the landmark district, even though many were described in the 1993 updated documentation as having “marginal integrity” because of demolition of other nearby buildings and various additions and modifications.³ At least eight NHLD contributing buildings and structures located near (north of) the Mason Street warehouses at the east end of Crissy Field, were demolished as part of past projects.

The following discussion addresses these impacts by project alternative.

Alternative 2, Replace and Widen – Presidio Impacts

The cumulative effect of the previous demolition of contributing elements, in conjunction with the Replace and Widen Alternative, differs depending upon the option under consideration. The Replace and Widen, No-Detour Option, would not contribute to an adverse cumulative effect to the Presidio NHLD. This alternative would not contribute to the erosion of the Presidio NHLD’s boundary within the Crissy Field Planning District (or North Cantonment historic functional area) because it does not require the removal of additional contributing elements, other than Doyle Drive. The removal of buildings in this area has been a concern because fewer buildings remain and those that have been preserved function to represent the historical function of the area as well as define the Presidio’s north east boundary.

The new Doyle Drive structures built under this option would resemble the existing Doyle Drive facility in overall location, material, color, and form and although they would be larger in scale and mass, they would not result in a cumulative adverse effect to the Presidio NHLD as defined by the *Criteria of*

³ NPS, “Presidio ... Registration Forms,” page 7-181.

Adverse Effect as outlined in 36 CFR 800.5(a)(1). Although Doyle Drive is a contributor to the Presidio NHLD and would be removed under this alternative, its loss would not contribute to a cumulative effect on the Presidio NHLD. The potential for this alternative to contribute to a cumulative effect to the Presidio NHLD, is low and a cumulative effect is not predicted.

The Replace and Widen, With Detour Option, could contribute to an adverse cumulative effect to the Presidio NHLD. Although Doyle Drive is a contributor to the Presidio NHLD and would be removed under this alternative, its loss would not contribute to a cumulative effect on the Presidio NHLD. While the new Doyle Drive structures built under this option would resemble the existing Doyle Drive facility in overall location, material, color, and form, this alternative would contribute to the erosion of the northeast boundary of the NHLD by removing contributing elements located in the Crissy Field Planning District, at the northeast corner of the NHLD. Specifically it would require the removal of four of the seven Mason Street warehouses (Buildings 1182, 1183, 1184, and 1185) from their original locations. Past projects have resulted in the demolition of at least eight NHLD contributing elements in this part of the former North Cantonment, just north of the Mason Street warehouses. The construction of the Replace and Widen, With Detour Option, therefore, would increase the loss of contributing elements in this area of the Presidio NHLD where few contributing buildings and structures remain. The removal of the warehouses could result in this area becoming a non-contributing portion of the Presidio NHLD, and erode the boundary of the district because it would no longer contain contributing elements. It is possible, therefore, for this alternative to result in an adverse cumulative effect to the Presidio NHLD, when compared to past, present, and future projects.

There would be direct effects to the cultural landscape resources of the Presidio NHLD under Alternative 2: Replace and Widen due to the: 1) alteration or removal of existing cultural landscape features; and 2) the addition of new non-historic features into the cultural landscape. The Replace and Widen Alternative would result in the destruction or alteration of historic circulation features including Doyle Drive, Veterans Boulevard, Lincoln Boulevard, Crissy Field Avenue, Battery Blaney Road, Marshall Street, Mason Street, Gorgas Avenue, and Halleck Street. In addition, construction would result in the removal of historic circulation features located in the area to the east and west of Halleck Street (south of Mason Street and north of Gorgas Avenue) and the paved and graveled open area under and south of the Doyle Drive viaduct, west of the Mason Street warehouses, north of Gorgas Avenue, and east of Halleck Street would be removed and landscaping would be added after construction. The removal of circulation features and the addition of landscaping would lessen the design, setting, materials, workmanship, association, and feeling that reflect the utilitarian and industrial functions of the Presidio and would result in an adverse effect and contribute to an adverse cumulative effect to the cultural landscape of the Presidio.

The construction of this alternative would also result in the alteration of the stands of trees in the area west of the Park Presidio Interchange and trees in the area east of the Park Presidio Interchange. Trees that are located in the area north of Lincoln Boulevard and south of the new at-grade portion of Doyle Drive would be removed, in addition to one of the palm trees that are located to the north of the existing low-viaduct structure in the New Commissary and Post Exchange parking lot, and one or more of the four Monterey cypress trees located to the west of the Mason Street warehouses (Buildings 1184 and 1185). These trees are a part of the historic vegetation features of the cultural landscape and their destruction would result in an adverse effect and contribute to an adverse cumulative effect to the cultural landscape of the Presidio.

There would also be indirect visual effects on the Presidio's cultural landscape under Alternative 2: Replace and Widen. Currently, Doyle Drive is clearly visible from Crissy Field and is a prominent feature in views toward the south, southeast, and southwest from Crissy Field. Key visual characteristic views of Doyle Drive from Crissy Field are: 1) the bridge's materials, color, form, massing, scale; and 2) the structure's decreasing elevation from west to east, reflecting the decreasing elevation of the natural topography of the bluff. Under Alternative 2, the existing Doyle Drive structure would be demolished and replaced with a new Doyle Drive structure that would be visible from Crissy Field. The new structure would be built on the existing structure's alignment. It would have a similar relationship to the natural topography of the bluff as the existing structure and the new structure's materials, color, and form would be similar to that of the existing structure. However, the new structure would be wider, and higher under the No-Detour Option, than the existing Doyle Drive. From a distance, the increased width and height of the new structure would be comparable in massing and scale to that of the existing structure. However, the increased width and height would increase the structure's visual presence and would alter the integrity of feeling in the areas immediately adjacent to Doyle Drive and contribute to an adverse cumulative effect to the cultural landscape of the Presidio.

Alternative 2, Replace and Widen – Individual Historic Properties

The potential for this alternative to result in a cumulative effect to the historic properties, when compared to past, present, and future projects, is described below by individual property.

The Marina and Presidio Viaducts of Doyle Drive would not experience a cumulative effect under the Replace and Widen Alternative because they would experience a direct adverse effect under this alternative. The Doyle Drive viaducts would be destroyed under both options of the Replace and Widen Alternative. This action constitutes a direct adverse effect on Doyle Drive but does not contribute to a cumulative effect because the entire eligible property (Doyle Drive) would no longer exist.

The Replace and Widen Alternative would likely cause an adverse cumulative effect on the Golden Gate Bridge historic property. This property would experience a direct adverse effect under both options of this alternative through the removal of Doyle Drive, which is a contributing element of the bridge property. It is possible that this effect, in combination with other current and future projects, would be cumulatively adverse. Other projects that involve the Golden Gate Bridge are on-going, however, the scope of the effects of these projects on the remaining portions of the Golden Gate Bridge property are not known at this time: the Golden Gate Bridge Seismic Retrofit Project, the Golden Gate Bridge Movable Median Barrier Project, Golden Gate Bridge Cable Restoration, and the Richardson Avenue Slip Ramp Project. It is not clear which features of the Golden Gate Bridge property will retain integrity once these projects are completed, but it is presumed that these proposed projects would not threaten the NHL eligibility of the Golden Gate Bridge. It may be necessary, however, to re-define the contributing elements of the bridge property upon completion of the current project.

The Replace and Widen Alternative would not cause an adverse cumulative effect on the Palace of Fine Arts property, a property that is listed in the NRHP. This historic property would not experience direct or indirect adverse effects under either option of this alternative and its designation as a NRHP-listed property would not be affected by the Project. This alternative would not cause an adverse cumulative effect when considered in conjunction with past, present, and future projects. Neither of the known on-going projects appears likely to cause adverse effects to the Palace of Fine Arts (Richardson Avenue Slip Ramp Project or the Rehabilitation of the Palace of Fine Arts Projects). It is assumed that the rehabilitation project will be accomplished in a manner consistent with the *Secretary's Standards for the Treatment of Historic Properties* (36 CFR part 68) and applicable guidelines [36 CFR 800.5(a)(2)(ii)], and would not “diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association” [36 CFR 800.5(a)(1)] of the Palace of Fine Arts Property.

The Replace and Widen Alternative would not cause an adverse cumulative effect on archaeological site CA-SFR-6/26 and it would remain eligible for the NRHP. This alternative would not cause direct or indirect adverse effects on known archaeological resources, nor does it appear that other known current and future projects would cause adverse effects to archaeological resources that would be cumulative when considered with the current project.

Alternative 5, Presidio Parkway – Presidio Impacts

The Presidio Parkway Alternative (under either option) could result in an adverse cumulative effect on the Presidio NHL. This alternative would introduce new structural and visual elements into a part of the Presidio NHL that has already lost some historic integrity through the demolition of contributing buildings and structures. The viaducts, tunnels, and at-grade portions of the Presidio Parkway Alternative that would be constructed in this northeast corner of the Presidio NHL would not resemble the existing Doyle Drive facility in overall location,

massing, and scale. In addition, the Presidio Parkway Alternative would require the destruction of additional contributing elements. The Presidio Parkway Alternative, under the Diamond Option, would result in the destruction of Buildings 201, 204, and 230, all of which are located in the former Quartermaster Depot functional area of what is now the Main Post Planning District and Building 670 which is in the vicinity of the Calvary Stables.

The Presidio Parkway Alternative, under the Circle Drive Option, would result in the destruction of the same four buildings, as well as Building 1151, which is located in the Letterman Planning District. Both options would require alteration of contributing roadways, including: Young Street, Bank Street, Halleck Street, Gorgas Avenue, Girard Road, Marshall Street, and Vallejo Street. The Presidio Parkway Alternative, therefore, would result in both the introduction of new construction, and the destruction of contributing buildings and structures under both options, and when considered in conjunction with past, present, and future projects, would result in an adverse cumulative effect to the Presidio NHLD.

There would be direct effects to the cultural landscape elements of the Presidio NHLD under the Presidio Parkway Alternative due to the alteration and removal of historic features and the addition of non-historic features into the cultural landscape. The construction of the new Doyle Drive structure would result in the destruction or alteration of historic circulation features including Doyle Drive, Veterans Boulevard, Cowles Street, Lincoln Boulevard, Crissy Field Avenue, Battery Blaney Road, Marshall Street, Bank Street, Mason Street, Gorgas Avenue, and Halleck Street. The construction of the new Doyle Drive structure would alter the existing grade of the bluff, a historic topographic feature of the Presidio cultural landscape. The presence of a continuous bluff is a character-defining feature of the Presidio. Its removal or alteration would impact the integrity of the Presidio and would lessen the understanding of the development of the Presidio over time. In particular the historic reasons for the location of the Main Post and the historic topographic and spatial relationship between the Main Post and the Lower Post areas on Crissy Field would be less apparent. The alteration and destruction of these historic topographic, circulation, and spatial organization features of the cultural landscape features would lessen the design, materials, workmanship, setting, feeling, and association that reflect:

- the spatial relationship of the Main Post, located upland of the Lower Post; and
- the service and supply land uses and activities and the related utilitarian nature of this portion of the Presidio.

This would constitute “physical destruction of or damage to all or part of the property” and “change of the character of the property’s use or of physical features within the property’s setting that contribute to its historic significance” and as such is an adverse effect under 36 CFR 800.5(a)(2)(i) and contribute to an adverse cumulative effect to the Presidio cultural landscape.

The construction of the new high-viaduct and reconfiguration of the Park Presidio Interchange would result in the alteration of the stands of trees in the areas west and east of the Park Presidio Interchange and north of Lincoln Boulevard and south of Doyle Drive near the National Cemetery. In addition, a stand of trees in the area north of Doyle Drive near Merchant Road and one or more of the three palm trees that are located to the north of the existing low-viaduct structure in the New Commissary and Post Exchange parking lot would be removed. These trees are a part of the historic vegetation features of the cultural landscape. The loss of some of the trees from these specific locations would result in an adverse effect under 36 CFR 800.5(a)(2)(i) and contribute to an adverse cumulative effect to the Presidio cultural landscape.

There would be indirect adverse visual effects on the Presidio's cultural landscape under Alternative 5: Presidio Parkway. Key visual characteristics of the views of Doyle Drive are: the bridge's materials, color, form, massing, and the structure's decreasing elevation, from west to east, that reflects the decreasing elevation of the natural topography of the bluff. The existing Doyle Drive structure would be replaced with a new Doyle structure that would be visible from Crissy Field, the Main Post, and the Letterman area, and the Quartermaster Depot. Views of the new structure would lessen the integrity of setting, association, and feeling that currently exists at the various locations around the Presidio and would constitute as adverse indirect effect under 36 CFR 800.5(a)(2)(v) and contribute to an adverse cumulative effect to the cultural landscape of the Presidio.

Alternative 5, Presidio Parkway – Individual Historic Properties

This cumulative effects analysis considers the potential for the Presidio Parkway Alternative, in combination with known past, present, and future projects in the area, to adversely effect individual historic properties within the Focused APEs. The Presidio Parkway Alternative would introduce tunnels, a type of structure not currently used in Doyle Drive. Furthermore, portions of the new alignment would be shifted away from the existing Doyle Drive alignment. This effects analysis has already identified the direct and indirect adverse effects that this alternative would cause to the historic properties within the Focused APEs. The potential for this alternative to result in a cumulative effect to the historic properties, when compared to past, present, and future projects, is described below by individual property.

The Doyle Drive viaducts would not experience a cumulative effect under the Presidio Parkway Alternative because they would experience a direct adverse effect under this alternative. The Doyle Drive viaducts would be destroyed under the options of the Presidio Parkway Alternative. This action constitutes a direct adverse effect and therefore no cumulative effect is expected when compared with past, present, or future projects.

The Presidio Parkway Alternative would likely cause an adverse cumulative effect on the Golden Gate Bridge historic property. This property would experience a

direct adverse effect under the options of this alternative through the removal of Doyle Drive, which is a contributing element of the bridge property. It is possible that this effect, in combination with other current and future projects, would be cumulatively adverse. Other projects that involve the Golden Gate Bridge are on-going, however, the scope of the effects of these projects on the remaining portions of the Golden Gate Bridge property are not known at this time: the Golden Gate Bridge Seismic Retrofit Project, the Golden Gate Bridge Movable Median Barrier Project, Golden Gate Bridge Cable Restoration, and the Richardson Avenue Slip Ramp Project. It is not clear which features of the Golden Gate Bridge property would retain its integrity once these projects are completed, but it is presumed that these proposed projects would not threaten the NHL eligibility of the Golden Gate Bridge. It may be necessary, however, to re-define the contributing elements of the bridge property upon completion of the current project.

The Presidio Parkway Alternative would not cause an adverse cumulative effect on the Palace of Fine Arts property, which is listed in the NRHP, a designation that would not be affected by the Project. This historic property would not experience direct or indirect adverse effects under either option of this alternative. This alternative would not cause an adverse cumulative effect when considered in conjunction with past, present, and future projects. Neither of the known on-going projects appears likely to cause adverse effects (Richardson Avenue Slip Ramp Project or the Rehabilitation of the Palace of Fine Arts Projects). It is assumed that the rehabilitation project would be accomplished in a manner consistent with the *Secretary's Standards for the Treatment of Historic Properties* (36CFR part 68) and applicable guidelines [36 CFR 800.5(a)(2)(ii)], and would not “diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association” [36 CFR 800.5(a)(1)] of the Palace of Fine Arts Property.

The Presidio Parkway Alternative would not cause an adverse cumulative effect on archaeological site CA-SFR-6/26 and it would remain eligible for listing on the NRHP. This alternative would not cause direct or indirect adverse effects on known archaeological resources, nor does it appear that other known current and future projects would cause adverse effects to these resources that would be cumulative when considered with the current project.

Preferred Alternative, Refined Presidio Parkway – Presidio Impacts

The Preferred Alternative may result in an adverse cumulative effect on the Presidio NHL. This alternative will introduce new structural and visual elements into a part of the Presidio NHL that has already lost some historic integrity through the demolition of contributing buildings and structures. The viaducts, tunnels, and at-grade portions of the Preferred Alternative that will be constructed in this northeast corner of the Presidio NHL will not resemble the existing Doyle Drive facility in overall location, mass, and scale. In addition, the Preferred Alternative will require the destruction of additional contributing elements, namely Buildings 204, 230 and 670. The Preferred Alternative will also

require the moving and partial demolition of Building 201 to accommodate the project. Building 228, which flanks Halleck Street, will also be adversely affected because Halleck Street must be raised from its current elevation to cross over the tunnel and pass back down to the lower post, therefore altering its spatial relationship with Halleck Street. Buildings 201, 204, 228 and 230 are all located in the former Quartermaster Depot functional area of what is now the Main Post Planning District. This area had previously experienced a number of building losses due to the construction of Crissy Marsh. Therefore, the loss of additional structures will be a cumulative effect on the Presidio NHLD and on the Quartermaster Depot functional area in particular.

The Preferred Alternative will require alteration of contributing roadways, including: Young Street, Halleck Street, Marshall Road, Gorgas Avenue, Girard Road, Cowles Street, and Vallejo Street. The Preferred Alternative, therefore, will result in both the introduction of new construction, and the destruction of contributing buildings and structures, and when considered in conjunction with past, present, and future projects, will result in an adverse cumulative effect to the Presidio NHLD.

There will be direct effects to the cultural landscape elements of the Presidio NHLD under the Preferred Alternative due to the alteration and removal of historic features and the addition of non-historic features into the cultural landscape. The construction of the new Doyle Drive structure will result in the destruction or alteration of historic circulation features including Doyle Drive, Veterans Boulevard, Cowles Street, Lincoln Boulevard, Crissy Field Avenue, Battery Blaney Road, Marshall Street, Mason Street, Cowles Street, Gorgas Avenue, and Halleck Street. The construction of the new structure will alter the existing grade of the bluff, a historic topographic feature of the Presidio cultural landscape. The presence of a continuous bluff is a character-defining feature of the Presidio. Its removal or alteration will impact the integrity of the Presidio and will lessen the understanding of the development of the Presidio over time. In particular, the historic reasons for the location of the Main Post and the historic topographic and spatial relationship between the Main Post and the Lower Post areas on Crissy Field will be less apparent. The Main Post, located on land that slopes down toward the north, was sited along the edge of this natural bluff that overlooks the San Francisco Bay. This location served both practical and symbolic functions. It provided for views of the Bay and the Golden Gate Bridge, and symbolized the Spanish control of these features. This location offered convenient access to the area along the water's edge that provided safe anchorage for ships. The alteration and destruction of these historic topographic, circulation, and spatial organization features of the cultural landscape features will lessen the design, materials, workmanship, setting, feeling, and association that reflect:

- the spatial relationship of the Main Post, located upland of the Lower Post; and

- the service and supply land uses and activities and the related utilitarian nature of this portion of the Presidio.

This will constitute “physical destruction of, or damage to all or part of, the property” and “change of the character of the property’s use or of physical features within the property’s setting that contribute to its historic significance” and as such is an adverse effect under 36 CFR 800.5(a)(2)(i) and contribute to an adverse cumulative effect to the Presidio cultural landscape.

The construction of the new high-viaduct and reconfiguration of the Park Presidio Interchange would result in the alteration of the stands of trees in the areas west and east of the Park Presidio Interchange, north of Lincoln Boulevard and south of Doyle Drive near the National Cemetery, a stand of trees in the area north of Doyle Drive near Merchant Road, and the removal of one or more of the three palm trees that are located to the north of the existing low-viaduct structure in the New Commissary and Post Exchange parking lot. These trees are a part of the historic vegetation features of the cultural landscape. The loss of some of the trees from these specific locations will result in an adverse effect under 36 CFR 800.5(a)(2)(i) and contribute to an adverse cumulative effect to the Presidio cultural landscape.

There will be indirect adverse visual effects on the Presidio’s cultural landscape under the Preferred Alternative. Key visual characteristics of the views of Doyle Drive are: the bridge’s materials, color, form, massing, and the structure’s decreasing elevation, from west to east, that reflects the decreasing elevation of the natural topography of the bluff. The existing Doyle Drive structure will be replaced with a new Doyle structure that will be visible from Crissy Field, the Main Post, and the Letterman area, and the Quartermaster Depot. Views of the new structure will lessen the integrity of setting, association, and feeling that currently exists at the various locations around the Presidio and will constitute as adverse indirect effect under 36 CFR 800.5(a)(2)(v) and contribute to an adverse cumulative effect to the cultural landscape of the Presidio.

Preferred Alternative, Refined Presidio Parkway – Individual Historic Properties

This cumulative effects analysis considers the potential for the Preferred Alternative, in combination with known past, present, and future projects in the area, to adversely effect individual historic properties within the APE. The Preferred Alternative will introduce tunnels, a type of structure not currently used in Doyle Drive. Furthermore, portions of the new alignment will be shifted away from the existing Doyle Drive alignment. This effects analysis has already identified the direct and indirect adverse effects that this alternative will cause to the historic properties within the APE. The potential for this alternative to result in a cumulative effect to the historic properties, when compared to past, present, and future projects, is described below by individual property.

The Doyle Drive viaducts will not experience a cumulative effect under the Preferred Alternative because they will experience a direct adverse effect under

this alternative. The Doyle Drive viaducts will be destroyed under the Preferred Alternative. This action constitutes a direct adverse effect and therefore no cumulative effect is expected when compared with past, present, or future projects.

The Preferred Alternative will likely cause an adverse cumulative effect on the Golden Gate Bridge historic property. This property will experience a direct adverse effect under the options of this alternative through the removal of Doyle Drive, which is a contributing element of the bridge property. It is possible that this effect, in combination with other current and future projects, will be cumulatively adverse. Other projects that involve the Golden Gate Bridge are on-going, however, the scope of the effects of these projects on the remaining portions of the Golden Gate Bridge property are not known at this time: the Golden Gate Bridge Seismic Retrofit Project, the Golden Gate Bridge Movable Median Barrier Project, Golden Gate Bridge Cable Restoration, and the Richardson Avenue Slip Ramp Project. It is not clear which features of the Golden Gate Bridge property will retain integrity once these projects are completed, but it is presumed that these proposed projects will not threaten the NHL eligibility of the Golden Gate Bridge. It may be necessary, however, to re-define the contributing elements of the bridge property upon completion of the current project.

The Preferred Alternative will not cause an adverse cumulative effect on the Palace of Fine Arts property which is listed in the NRHP. This historic property will not experience direct or indirect adverse effects under this alternative. This alternative will not cause an adverse cumulative effect when considered in conjunction with past, present, and future projects. Neither of the known on-going projects appears likely to cause adverse effects (Richardson Avenue Slip Ramp Project or the Rehabilitation of the Palace of Fine Arts Projects). It is assumed that the rehabilitation project will be accomplished in a manner consistent with the *Standards for the Treatment of Historic Properties* (36 CFR part 68) and applicable guidelines [36 CFR 800.5(a)(2)(ii)], and will not “diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association” [36 CFR 800.5(a)(1)] of the Palace of Fine Arts Property.

The Preferred Alternative will not cause an adverse cumulative effect on archaeological site CA-SFR-6/26 and it will remain eligible for listing on the NRHP. This alternative will not cause direct or indirect adverse effects on known archaeological resources, nor does it appear that other known current and future projects will cause adverse effects to these resources that will be cumulative when considered with the current project.

5.6.5 Visual Quality

Several of the projects and plans discussed in Section 5.5 have the potential to result in temporary and permanent visual changes within the landscape units and viewshed of the Doyle Drive Project. These projects and plans include the Letterman Digital Arts Center, Presidio Transit Center, Crissy Marsh Expansion,

Tennessee Hollow Restoration, Building Rehabilitation in the Presidio, and the Rehabilitation of the Palace of Fine Arts.

Of these projects several will involve rehabilitation of existing buildings (building rehabilitation in the Presidio and Rehabilitation of the Palace of Fine Arts) to preserve and restore their historic character which will result in minor improvements in the visual setting and character of the project area. Several projects will result in substantial improvements to the existing visual setting of the project area by expanding natural habitat areas (i.e., Crissy Marsh Expansion and Tennessee Hollow Restoration).

The Presidio Transit Center will result in a new transportation oriented use being located within the Main Post landscape unit. The visual character of this area consists of offices, warehouses, parking lots and roadways, and as such, the transit center in combination with the Doyle Drive Project will not result in a cumulatively significant change in the visual character of this area.

The Letterman Digital Arts Center has resulted in a dramatic visual change within the Main Post and Richardson Avenue Exit landscape units. The Digital Arts Center was the subject of a previous environmental impact statement. That report concluded that the Digital Arts Center will enhance the visual integrity of the Letterman area, improve views from many vantage points within the Presidio, and result in a visual scale more appropriate for the surrounding area. (Page 239, *Final Environmental Impact Statement and Planning Guidelines* for new development uses on 23 areas within the Letterman Complex, Presidio Trust, March 2000).

The Doyle Drive Project in combination with other projects will result in an overall beneficial effect on the visual environment, particularly when considering such projects as historic restoration, wetland enhancement, and removal of the elevated transportation corridor, which are all consistent with the plans and policies for the Presidio.

5.7 Summary of Cumulative Effects for Resource Areas

Exhibit 5-1 summarizes the potential cumulative effects presented in this chapter.

Exhibit 5-1
Summary of Cumulative Effects

RESOURCE AREA	NO-BUILD	REPLACE AND WIDEN	PRESIDIO PARKWAY	PREFERRED
Traffic and Transportation	No impacts expected	No impacts expected	No impacts expected	No impacts expected
Biological Environment	Beneficial Effects	Cumulative mitigation benefits would outweigh potential adverse impacts	Cumulative mitigation benefits would outweigh potential adverse impacts	Cumulative mitigation benefits would outweigh potential adverse impacts
Hydrology	No impacts expected	No impacts expected	No impacts expected	No impacts expected
Cultural Resources	No impacts expected	<i>No-Detour Option:</i> No impacts expected <i>With Detour Option:</i> Potential Adverse Effect	<i>Circle Drive Option:</i> Potential Adverse Effects <i>Diamond Option:</i> Potential Adverse Effects	Potential Adverse Effects
Visual Quality	Beneficial Effects	Beneficial Effects	Beneficial Effects	Beneficial Effects

CHAPTER SIX

PUBLIC AND AGENCY INVOLVEMENT PROCESS/ NATIVE AMERICAN TRIBAL COORDINATION

This chapter describes the public outreach and agency coordination activities undertaken prior to issuance of the *South Access to the Golden Gate Bridge – Doyle Drive Draft Environmental Impact Statement/Report* (DEIS/R) in December 2005. This chapter also presents public and agency involvement activities from the release of the DEIS/R to the selection of the Preferred Alternative.

The preparation of this *Final Environmental Impact Statement/Report* (FEIS/R) has included consultation and coordination with federal, state, and local agencies, and with elected officials, community leaders, organizations and other individuals from the neighborhoods; and communities within the project area. Outreach efforts have included scoping meetings, open houses, and smaller, community meetings. **Appendix E** provides a comprehensive listing of activities and meetings. In addition, a detailed summary of public and agency comments on the DEIS/R is included in **Appendix L**.

6.1 Public Scoping

The process of determining the scope, focus and content of an EIS/R is known as “scoping.” Scoping meetings are a useful opportunity to obtain information from the public, community organizations, interested agencies, and governmental agencies. In particular, the scoping process asks agencies and interested parties to provide input on the proposed alternatives, the topics of evaluation, and potential impacts and mitigation measures to be considered in the environmental document.



Community members compare preliminary alternatives

For the Doyle Drive Project, the scoping process began with formal notification to agencies. On February 16, 2000, the Federal Highway Administration (FHWA), as the lead agency for the project under the *National Environmental Policy Act* (NEPA), published a *Notice of Intent* in the Federal Register (see **Appendix H**) to advise interested agencies and the public that an EIS/R would be prepared. On February 23, 2000, the San Francisco County Transportation

Authority (the Authority), as the project lead agency under the *California Environmental Quality Act* (CEQA), distributed a *Notice of Preparation* (see **Appendix H**) to advise interested agencies and the public that an EIR would be prepared. The Authority distributed the *Notice of Preparation* to approximately 162 agencies, elected officials, interested parties, and public libraries in the study area.

The Authority also notified potentially interested organizations and individuals about the project and the public scoping meetings. The public meeting announcement was distributed to approximately 2,100 interested organizations and individuals, including property owners in the project area. Invitation letters were sent to elected officials to encourage their participation and the Authority published a newspaper advertisement in the *San Francisco Chronicle* (February 28, 2000) and in the *Marin Independent Journal* (February 29, 2000). A press release was distributed to approximately 136 area newspapers and media outlets.

Four formal scoping meetings were conducted by the Authority to gather input and comments prior to the development of the DEIS/R. On March 3, 2000, the Authority held an agency scoping meeting that consisted of a brief presentation by the project team with a facilitated question and answer period. Two public scoping open houses were held on March 14 and 15, 2000. Approximately 135 people attended the three meetings. The agency scoping meeting consisted of a brief presentation by the project team with a facilitated question and answer period after the presentation. In addition, the Golden Gate National Recreation Area (GGNRA) Advisory Commission hosted an additional scoping meeting on March 21, 2000. GGNRA transcribed the comments provided at that meeting. A summary of the scoping meetings can be obtained from the Authority or found on the project website (www.doyledrive.org).

An additional public meeting was held on February 23, 2004 at the Golden Gate Club in the Presidio. The meeting was held to provide an update on the progress of technical and environmental studies and to present an additional design alternative: Alternative 5, Presidio Parkway. The Authority sought input on a provisional decision to eliminate the single tunnel alternatives (Alternatives 3 and 4) from further consideration and to move forward with study of Alternative 5, in addition to Alternatives 1 and 2. A notice was mailed to over 2,000 individuals, organizations, agencies, elected officials and other special interest representatives, display ads were placed in both the *San Francisco Chronicle* and the *Marin Independent Journal*, and a media release was distributed to local newspapers and media outlets. Information was also posted on the project website (www.doyledrive.org) and letters were mailed to the Agency Working Group (also known as the Executive Committee) and the Doyle Drive Subcommittee of the Authority's Citizens Advisory Subcommittee.

The meeting was attended by approximately 120 people and no comments were received that objected to the provisional decision to delete alternatives. Of the 26 comments received at, or following the meeting, half indicated support to proceed with the studies of Alternatives 1, 2, and 5. Other comments referred to historical resources, natural resources, construction, noise, safety, and parking.

All comments are documented in the *Final Public Meeting and Outreach Summary Report* dated April 21, 2004.

6.2 Public and Agency Coordination

Citizen and agency working groups were established to meet and receive updates on design and environmental issues and provide input. This section presents an overview of these committees and working groups.

Citizens Subcommittee

A Doyle Drive Subcommittee of the Authority's Citizens Advisory Committee (CAC) was established as a primary component of the public involvement process for the Doyle Drive Project. The Subcommittee meets periodically and provides input on a wide range of issues pertaining to Doyle Drive. Prior to the release of the DEIS/R, there were 17 Subcommittee meetings from March 2000 to November 2005, including a bus/walking tour of the project area with the Subcommittee and Agency Working Group. This was followed by a workshop on the design alternatives. Summaries and agendas from these meetings are posted on the Doyle Drive website. In advance of each Subcommittee meeting, informational packets with an agenda and other project materials are mailed to members of the Subcommittee, the Agency Working Group, the Authority's Citizen Advisory Committee, and a group of 83 interested parties before each meeting. The Subcommittee meeting agenda is also posted at the Authority's office. **Exhibit 6-1**, on the following page, presents a listing of the interest groups invited to participate in the CAC Subcommittee.

Prior to the release of the DEIS/R, topics considered by the Subcommittee have included the project purpose and need, screening of alternatives, refinement of alternatives, design and aesthetic considerations, traffic, environmental impacts, and neighborhood issues.

Agency Working Group (Executive Committee)

The Authority established a public Agency Working Group, also known as the Executive Committee, to provide ongoing input on project development, alternatives refinement, scope and approach to environmental studies, and engineering considerations. The Agency Working Group generally meets bi-monthly and had 39 meetings from March 2000 to September 2005, prior to the release of the DEIS/R. In addition, two separate bus tours of the project area were provided for the U.S. Department of Veterans Affairs and the Federal Highway Administration. Presentations to various agency boards have been provided to groups such as the Golden Gate Bridge, Highway and Transportation District, the Golden Gate National Recreation Area Advisory Commission and the Presidio Trust.

Exhibit 6-2 presents a listing of Agency Working Group members.

Exhibit 6-1
Invited Members: CAC Subcommittee

- ▶ Citizens At-Large, San Francisco
- ▶ Cow Hollow Neighbors in Action
- ▶ Golden Gate National Recreation Area Advisory Commission
- ▶ Commuters, Marin County
- ▶ Marina Merchants Association
- ▶ Planning Association for the Richmond
- ▶ San Francisco Bicycle Coalition
- ▶ San Francisco Planning and Urban Research Association
- ▶ Sierra Club
- ▶ Cow Hollow Association
- ▶ Fort Point & Presidio Historical Association
- ▶ Marina Civic Improvement and Property Owners Association
- ▶ Marina Neighborhood Association
- ▶ Neighborhood Association for Presidio Planning
- ▶ Presidio Residents and Tenants
- ▶ San Francisco County Transportation Authority, Citizens Advisory Committee
- ▶ San Francisco Tomorrow

Exhibit 6-2
Invited Members: Agency Working Group

- ▶ Association of Bay Area Governments
- ▶ Bay Area Air Quality Management District
- ▶ California Department of Transportation, District 4
- ▶ Federal Highway Administration
- ▶ Golden Gate Bridge, Highway and Transportation District
- ▶ Golden Gate National Recreation Area/National Park Service
- ▶ Marin County, Department of Public Works
- ▶ Metropolitan Transportation Commission
- ▶ The Presidio Trust
- ▶ US Department of Veterans Affairs
- ▶ San Francisco Bay Conservation and Development Commission
- ▶ San Francisco City and County, Department of Parking and Traffic
- ▶ San Francisco City and County, Planning Department
- ▶ San Francisco Recreation and Park Department
- ▶ San Francisco County Transportation Authority

Other Interested Parties

In addition to the Agency Working Group, the project team held over 50 meetings with technical specialists from participating agencies to review environmental issues and provide input.

A number of other organizations, agencies, and individuals have been consulted about the proposed project. On April 19, 2001, letters were sent to 19 individuals and organizations concerned with the history and historic preservation of the Presidio. Consultation between agencies and the State Historic Preservation Officer (SHPO) regarding this project has been ongoing since the first Doyle Drive Project meeting, which began with the development of the Area of Potential Effect (APE). The SHPO has participated in agency meetings to discuss and set the APE, as well as to advise on historic preservation issues for both archaeology and the built environment. In addition, representatives from the Advisory Council on Historic Preservation (ACHP) have visited the project site and taken an interest in its development.

6.3 Additional Public Outreach

In addition to the formal committee and working group meetings, other public outreach efforts included:

Outreach Meetings

The Doyle Drive project team has periodically met with small groups of citizens and with individual citizens to discuss project issues. In spring 2000, the project team held stakeholder interviews and meetings with area residents and neighborhood organizations to introduce the project and identify key issues. Additional stakeholder meetings were held in winter 2001 to discuss the preliminary project alternatives. Representatives of the project team attended neighborhood association meetings throughout the process to present Doyle Drive Project issues (including approximately ten meetings in Spring 2004) to gather input on the provisional decision to eliminate Alternatives 3 and 4, and include Alternative 5 for further studies.

Newsletters

Two newsletters were published addressing the Doyle Drive Project status. The first edition was released in January 2001, and focused on the purpose of the Doyle Drive Project and the alternatives being evaluated at the time. The second newsletter, issued in July 2002, discussed the alternatives that were chosen to be evaluated for the DEIS/R and the opportunities for public comment. Both newsletters were sent to a mailing list of over 1,500 individuals including elected officials, community members, and representatives from county and city agencies.

Fact Sheet

A project fact sheet was developed in February 2004 to provide information on the alternatives being evaluated in the DEIS/R. The fact sheet was mailed to the Agency Working Group and the Citizens Subcommittee. It was distributed to attendees of the February 23, 2004 public meeting and was made available at subsequent neighborhood association and agency meetings.

Website

The Doyle Drive website provides the public with the most up-to-date information about the project including the latest design alternative graphics and project schedule. The site provides the opportunity for the public to submit comments to the project team. Members of the public also can request to be added to the Doyle Drive mailing list through the website at www.doyledrive.org.

Design Charrette for the Five Corners Intersection

In July 2004, the Authority invited the public, local businesses, and the San Francisco Department of Parking and Traffic (DPT) to participate in a series of facilitated workshops to define the existing problems associated with the Five Corners Intersection. This intersection is where Marina Boulevard, Mason

Street, Lyon Street, Doyle Drive, and Yacht Road meet. During the charrette, the public had the opportunity to discuss traffic operations and recommend general design options for this location.

Results from the charrette were submitted to DPT for their review, consideration and implementation, as

appropriate. Although not officially part of this Doyle Drive Project, there was extensive coordination and integration between both processes.



Working together at the Five Corners Intersection Charrette Session

6.4 Summary of Native American Consultation

Through the consultation process, local Native Americans -- the Ohlones -- have been involved in all aspects of the investigation and planning for this project. Participants have contributed their knowledge and perception to the process and, as a result, have assisted in the overall assessment of significance and potential

impacts. Since release of the DEIS/R, the Ohlones were sent copies of the *Finding of Effect* document prepared for this project. In addition, on September 21, 2006, the Ohlones were invited to participate in a *Section 106* workshop. More information can be found in the *South Access to the Golden Gate Bridge - Doyle Drive Project Cultural Resources Technical Report*, October 2004.

Exhibit 6-3 presents a listing of Ohlones outreach efforts.

**Exhibit 6-3
Ohlone Outreach Activities**

ACTIVITY	DATE
November 22, 2000	Information letters mailed to twelve Ohlones groups
April 19, 2001	Project materials sent to interested parties
June 18, 2001	Meeting with interested individuals and Ohlones groups
August 21, 2001	Updated project information package mailed to interested individuals and Ohlones groups
November 11, 2001	An open house was held to present the information on an archeological site in the project study area
March 18, 2002	A formal meeting was held with Ohlones representatives to discuss findings from the archeological site testing

6.5 Section 106 Compliance

In addition, in compliance with *Section 106* of the *National Historic Preservation Act*, meetings have been on-going with several historic preservation groups with interest in the resources at the Presidio. Specifically, numerous meetings have been held with members of the Fort Point and Presidio Historical Association, the California Heritage Council, and San Francisco Architectural Heritage to review their concerns about the project and to facilitate their participation in the *Section 106* compliance process.

6.6 Outreach Activities Related to the Release of the DEIS/R, Identification of the Preferred Alternative and Preparation of the FEIS/R

The release of the DEIS/R, selection of the Preferred Alternative and preparation of the FEIS/R have included consultation and coordination with federal, state, and local agencies, and with elected officials, community leaders, organizations and other individuals from neighborhoods and communities within

the project area. Outreach efforts have included public hearings, design and sustainability workshops, neighborhood outreach meetings, agency and subcommittee coordination, a public website and printed informational materials.

DEIS/R Public Release and Distribution

The DEIS/R was published in the *Federal Register* and officially released for public review on December 30, 2005. The formal review period ended on March 31, 2006. The DEIS/R was distributed to elected officials, key agencies, community groups and interested citizens. The package mailed with the DEIS/R contained companion materials, including CD's of the technical studies and a *Citizens' Guide to the Environmental Document*.

Copies of the DEIS/R and companion materials were made available to the general public through multiple sources, including local libraries, the project website, and upon request through the website, the project email address, or by calling the Authority.

Citizens' Guide to the Environmental Document

The *Citizens' Guide* is a booklet that summarizes the content of the DEIS/R. The *Citizens' Guide* was developed to provide an overview of the proposed Doyle Drive Project, the alternatives being considered, and key environmental factors that would result from the construction and long-term operation of the project. The guide was included in the DEIS/R packet and was distributed at stakeholder meetings and outreach events.

Public Hearings on the DEIS/R

In January and February 2006, the project team hosted two public hearings on the DEIS/R. The first hearing occurred on January 18, 2006, at 6:00 PM in the California State Building Auditorium. The second hearing was held on February 15, 2006, at 6:00 PM at the Golden Gate Club in the Presidio. Both meetings featured similar formats and content.

The public hearings were formatted as a combination open house and public hearing. The public open house occurred from 6:00 PM to 7:00 PM, during which time attendees could circulate among exhibit stations and talk to members of the project team. At 7:00 PM, the event shifted into a formal public hearing, which was recorded by a court reporter. A project overview was presented by members of the project team. After the presentation, hearing attendees offered formal comments on the DEIS/R. A panel of key members of the project team was present to respond to comments, as appropriate.

Members of the public received several forms of notification about the public hearings, beginning in December 2005. A direct mail notice was sent twice to the complete Doyle Drive mailing list of approximately 2,600. Legal notices were printed in two local newspapers: *The San Francisco Chronicle* and *The Marin Independent Journal*. Additionally, the project website featured the dates and times of the public hearings, as well as links to public transit and driving directions.

The project team conducted media outreach efforts prior to each public meeting. A press kit containing a press release, *Citizens' Guide*, public hearing flyer, project fact sheet, and CD with video files was sent to a comprehensive list of area media contacts. Media outreach efforts resulted in increased press attention to the upcoming public hearings and the DEIS/R review period, including a story on the KTVU Channel 2 News and articles in the *San Francisco Chronicle*, *San Francisco Examiner*, and other area newspapers.

Design Workshops

The project team conducted multiple design workshops to seek input on different elements of the project and to develop appropriate design refinements. Two workshops focused primarily on avoiding and minimizing impacts to cultural resources. Two additional workshops focused on the overall project design, with an emphasis on traffic calming and refinements to Presidio access. A final workshop focused on project refinements to reduce impacts on biological resources and wildlife. These workshops assisted in identifying design refinements to address concerns of interested agencies, organizations, and residents.

Sustainability Workshops

As a result of public input, the project team conducted three sustainability workshops to develop concepts for a sustainability program for the Doyle Drive Project. The first workshop focused on generating input for the development of a vision statement, guiding principles and goals/objectives for the sustainability program. The second workshop was held to develop evaluation criteria and the final workshop identified sustainable strategies for implementation of the sustainability program. The workshops were publicized to the Agency Working Group, Subcommittee and posted at the Authority for the general public.

Citizens' Subcommittee

The Subcommittee met four times since the release of the DEIS/R. In June and July 2006, two meetings were held to update Subcommittee members about comments received on the DEIS/R, provide an overview of the status of the alternatives, and to receive a recommendation on the Preferred Alternative. In November 2006, the Subcommittee received an update on the project status, the environmental process next steps, and discussed the process to develop sustainability principles for the project. The final meeting prior to the release of the FEIS/R was held to update the Subcommittee on the project and to provide them with a preview of the FEIS/R.

Agency Working Group (Executive Committee)

The Agency Working Group conducted eight meetings since the release of the DEIS/R.

Milestones for the Selection of the Preferred Alternative

After extensive public and agency involvement, consensus was achieved among key committees and the Authority Board of Commissioners voted to formally identify the Preferred Alternative in the Final EIS/R. **Exhibit 6-4** provides a listing of outreach meetings where participants discussed the project and provided insight into the selection of a Preferred Alternative

Exhibit 6-4
Listing of Public Outreach Meetings

DATE	MEETING
11/29/05	Subcommittee to the Authority's Citizens' Advisory Committee (CAC)
11/29/05	Executive Committee
12/07/05	Authority's Citizen's Advisory Committee
12/08/05	Cow Hollow Association
12/12/05	Meeting with Michaela Alioto-Pier's Staff
01/17/06	San Francisco Planning & Urban Research (SPUR) Noontime Forum
01/18/06	Public Hearing
01/24/06	Meeting with Lucas Digital Arts
01/25/06	Project Briefing with Mayor Newsom and Supervisor Alioto-Pier
01/26/06	Planning Association for the Richmond
01/26/06	Golden Gate Bridge, Highway & Transportation District (GGBHTD)
02/02/06	Briefing on Natural Resources
02/06/06	Marina Community Association
02/08/06	Meeting with Presidents of Neighborhood Associations
02/13/06	Meeting with Lyon Street Residents
02/14/06	Meeting with GGBHTD Board Members
02/15/06	Public Hearing
02/21/06	Briefing on Traffic Modeling
02/22/06	Alternatives Workshop - Cultural and Natural Resources
02/23/06	Meeting with California Heritage Council
02/28/06	National Park Service Public Meeting
02/28/06	Golden Gate National Recreation Area (GGNRA) Meeting
03/07/06	Cow Hollow Association Meeting
03/15/06	Design Workshop
03/22/06	Peer Review Workshop
03/28/06	Executive Committee

Exhibit 6-4 (Continued)
Listing of Public Outreach Meetings

DATE	MEETING
04/05/06	Memorandum of Agreement (MOA) Workshop
04/20/06	Design Workshop
05/03/06	MOA Workshop
05/03/06	Meeting with staff from Alioto-Pier's Office
05/30/06	Executive Committee
06/20/06	Meeting with Lyon Street Residents
06/22/06	Subcommittee to the Authority's CAC
07/18/06	Subcommittee to the Authority's CAC
07/25/06	Executive Committee
07/26/06	Authority's Citizen's Advisory Committee
07/27/06	MOA Team Meeting
07/27/06	MOA Workshop
08/24/06	GGBHTD Building & Operating Committee
09/18/06	Authority Plans & Programs Committee
09/26/06	Authority Board of Commissioners
09/26/06	Executive Committee
11/09/06	Subcommittee to the Authority's CAC
11/28/06	Executive Committee
01/30/07	Executive Committee
03/27/07	Executive Committee
04/18/07	Sustainability Workshop #1
05/17/07	Sustainability Workshop #2
05/29/07	Executive Committee
06/11/07	Sustainability Workshop #3
07/31/07	Executive Committee
09/25/07	Executive Committee
11/27/07	Executive Committee
12/13/07	Subcommittee to the Authority's CAC
1/29/08	Executive Committee
3/25/08	Executive Committee
3/27/08	Subcommittee to the Authority's CAC

6.7 Summary of Public and Agency Comments on the DEIS/R

During the formal comment period of the DEIS/R, a total of 808 comments were received from the public. A total of 358 of these comments addressed the project alternatives, while 100 comments focused on traffic issues. The remaining comments addressed a wide variety of topics, as shown in **Exhibit 6-5** on the following pages. Of these topics, the major categories on which the public and agencies commented included:

- biological resources;
- noise;
- air quality;
- traffic;
- stormwater;
- cultural resources; and
- selection of the Preferred Alternative.

Exhibit 6-6 on the following pages provides a summary of the public and agency comments on the alternatives.

Issues that the public stated were ongoing and that needed resolution included:

- treatment of roadway surface water runoff and proposed connection to SFPUC system;
- continuing concerns regarding shading and coordination with marsh restoration;
- agreement on right of way interests with the Presidio Trust; and
- identification of cultural mitigation through the MOA and the assessment of any additional impacts of the mitigation measures.

Since the end of the formal comment period on March 31, 2006, additional input was received at project workshops and through other media. Some of the issues commented on during this time included:

- clarification of the connection to Marina Boulevard;
- continued concerns regarding potential new traffic patterns;
- configuration of the southbound exit ramp to Girard Road; and
- recommendations for the preservation of historic resources.

The project team will continue to gather input from interested parties and address concerns, as appropriate, within the framework of the environmental process.

Exhibit 6-5
Number of Comments by Subject/Resource Area

SUBJECT/RESOURCE AREA	TOTAL
Air Quality	12
Animal Species	10
CEQA Evaluation	6
Community Impacts	18
Cultural Resources	43
Cumulative	11
Energy	3
General	41
Geologic	3
Hazardous Waste/Materials	1
Hydrology and Floodplains	25
Invasive Species	3
Land Use	13
List of Preparers	1
Natural Communities	16
Noise and Vibration	26
Park and Recreation Facilities	8
Parking	15
Plant Species	19
Project Alternatives	358
Public Involvement	1
Purpose and Need	9
Section 4(f)	9
Summary	6
Threatened and Endangered Species	1
Traffic and Transportation	107
Visual and Aesthetics	13
Water Quality and Storm Water Run-Off	12
Wetlands and Other Waters of the United States	18
TOTAL	808

**Exhibit 6-6
Summary of Public Comments on Project Alternatives**

ISSUE/OPTION	FOR (AGAINST)				
	TRUST	GGNRA	GGBHTD	GROUPS	CITIZEN
Alternative 1			(1)	(1)	2 (1)
Alternative 2				1	18
Detour	(1)			(1)	1 (1)
Alternative 5	1	1		19 (1)	35 (5)
Merchant Road Slip Ramp	(1)	(1)	1	(6)	2 (6)
Hook Ramp	1	1		5 (1)	6
Loop Ramp				(1)	1
Existing Configuration					
Circle Drive				8	6 (16)
Diamond	1	1		3	7
General Concerns					
Construction Schedule	1		1	1	
Transit Improvement:			1	1	1
Revise Alt 1 for Weight Restrictions			1		
Save Pool- Open During Construction		1		1	52
Bike Access Needed				2	4
2 Lanes W/B from Marina				2	4
Lyon Connection				4	2
Trapped in Tunnels					5
Shorten Tunnels				2	1
Need for Reduce Shading				2	
Against Future Additional Lanes				2	2
Intelligent Transportation Systems				2	1
Fugitive Light				2	
Alternative 5/2 Hybrid					2

CHAPTER SEVEN

FINAL SECTION 4(F) EVALUATION

This *Final Section 4(f)* evaluation is an update and refinement of the *Draft Section 4(f) Evaluation* that was circulated for public and agency comment as part of the *Draft Environmental Impact Statement/Report* (DEIS/R) in December 2005. After publication and circulation of the DEIS/R, the sponsor agencies:

- conducted two public hearings on this DEIS/R - January 18, 2006 and February 15, 2006;
- provided a public comment period from December 30, 2005 to March 31, 2006 where interested parties submitted written comments on the DEIS/R; and
- identified a Preferred Alternative (Spring 2006).

Following release of the DEIS/R in December 2005, individuals and agency staff provided over 800 comments regarding the environmental analysis and project alternatives. Based on these comments and agency/public workshops, it was determined that Alternative 5: Presidio Parkway, would best meet the purpose and need of the Doyle Drive Project, if certain modifications to the proposed design (as presented in the DEIS/R) were made (discussed in greater detail in Chapter 2 of this document). The Refined Presidio Parkway Alternative, incorporating these modifications, would replace the existing facility with a new six-lane facility and an eastbound auxiliary lane, between the Park Presidio Interchange and the new Presidio access at Girard Road.

7.1 Section 4(f) Regulations

This *Section 4(f) Evaluation* complies with the Federal requirements codified in Federal law at 49 U.S.C. §303, commonly referred to as *Section 4(f)* of the *Department of Transportation Act of 1966*. *Section 4(f)* declares that “[i]t is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation land, wildlife and waterfowl refuges, and historic sites.”

Section 4(f) specifies that “[the] Secretary [of Transportation] may approve a transportation program or project...requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- 1) there is no prudent and feasible alternative to using that land; and

- 2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.”

Section 4(f) further requires consultation with the Department of the Interior (DOI) and, as appropriate, the involved offices of the Departments of Agriculture (USDA) and Housing and Urban Development (HUD) in developing transportation projects and programs which use lands protected by *Section 4(f)*. Consultation with the USDA would occur whenever a project uses *Section 4(f)* land from the National Forest System. Consultation with HUD would occur whenever a project uses *Section 4(f)* land for/on which certain HUD funding had been utilized. Since neither of these conditions applies to the proposed project, consultation with the USDA and HUD is not required.

In general, a *Section 4(f)* “use” occurs with a Department of Transportation-approved project or program when:

- 1) *Section 4(f)* land is permanently incorporated into a transportation facility.
- 2) When there is a temporary occupancy of *Section 4(f)* land that is adverse in terms of the *Section 4(f)* preservationist purposes as determined by specified criteria (23 CFR §774.13[d]); or
- 3) When *Section 4(f)* land is not incorporated into the transportation project, but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under *Section 4(f)* are substantially impaired (constructive use). (23 CFR §774.15).

Since circulation of the DEIS/R in 2005 FHWA has promulgated new *Section 4(f)* regulations, codified at 23 CFR Part 774 (73 Fed. Reg. 13368, March 12, 2008). These new regulations do not substantively change the requirements of the previous 4(f) regulations, which were codified at 23 CFR § 771.135. The new regulations do, however, clarify the factors to be considered and the standards to be applied when determining if an alternative for avoiding the use of *Section 4(f)* property is feasible and prudent, as well as the factors to be considered when selecting a project alternative in situations where all alternatives would use some *Section 4(f)* property. This *Final Section 4(f) Evaluation* has been prepared in compliance with Part 774.

7.2 Proposed Action

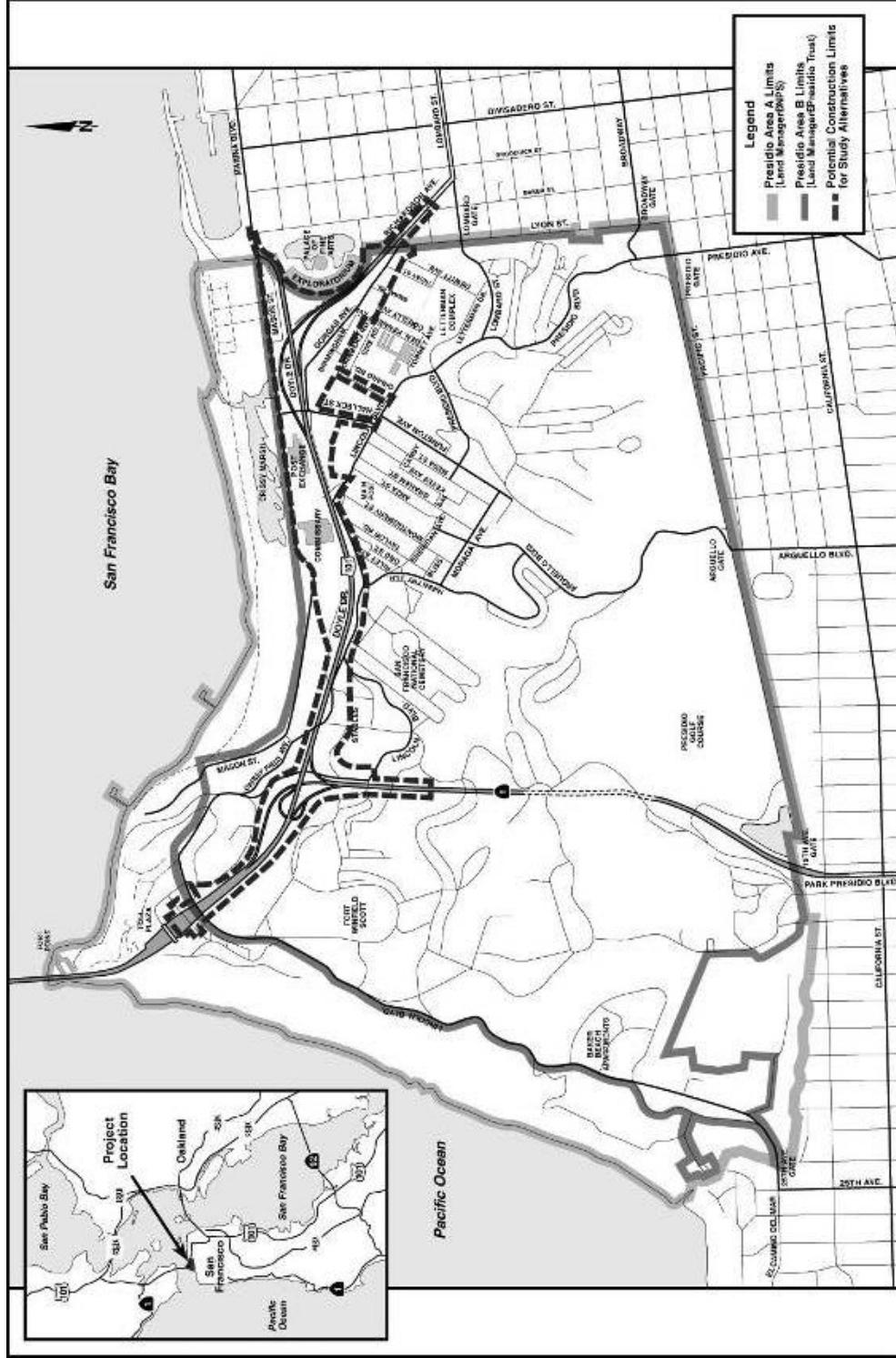
A complete discussion of the purpose and need for the project is provided in Chapter 1 of this *Final Environmental Impact Statement/Report* (FEIS/R) and is incorporated herein by reference.

The purpose of the project is to improve the seismic, structural, and traffic safety of Doyle Drive (see **Exhibit 7-1**) within the setting and context of the Presidio of San Francisco and its purpose as a National Park. Objectives of the Doyle Drive project are to:

- improve the seismic, structural and traffic safety of Doyle Drive;
- maintain the functions that the Doyle Drive corridor serves as part of the regional and City transportation network;
- improve the functionality of Doyle Drive as an approach to the Golden Gate Bridge;
- preserve the natural, cultural, scenic, and recreational values of affected portions of the Presidio;
- be consistent with the *San Francisco General Plan* and the *General Management Plan Amendment Final Environmental Impact Statement, Presidio of San Francisco, Golden Gate National Recreation Area* (NPS 1994a and 1994b) for Area A of the Presidio and the *Presidio Trust Management Plan: Land Use Policies for Area B of the Presidio of San Francisco* (Presidio Trust 2002);
- minimize the effects of noise and other pollution from the Doyle Drive corridor on natural areas and recreational areas at Crissy Field and other areas adjacent to the project;
- minimize the traffic impacts of Doyle Drive on the Presidio and local roadways;
- improve intermodal and vehicular access to the Presidio; and
- redesign the Doyle Drive corridor using the parkway concept described within the *Doyle Drive Intermodal Study* (1996).

The following sections describe the alternatives considered in the DEIS/R and the Preferred Alternative identified subsequent to circulation of that draft document. A more detailed discussion of the project alternatives, including exhibits, can be found in Chapter 2 of this FEIS/R.

**Exhibit 7-1
Doyle Drive Project Location Map**



7.2.1 Alternative 1: No-Build Alternative

The No-Build Alternative represents the future year conditions if no other actions are taken in the study area beyond what is already programmed by the year 2020. It is the baseline condition and future travel conditions against which all the alternatives are compared. Doyle Drive would remain in its current configuration (i.e., “No-Build”): 2.4 kilometers (1.5 miles) long with six traffic lanes ranging in width from 2.9 to 3 meters (9.5 to 10 feet) wide. No fixed median barriers or shoulders currently exist on Doyle Drive. The roadway passes through the Presidio on one high steel truss viaduct and one low elevated concrete viaduct with lengths of 463 meters (1,519 feet) and 1,137 meters (3,730 feet), respectively. The height of the high-viaduct varies from 20 to 35 meters (66 to 115 feet) above the ground surface while the low-viaduct has an average of eight meters (26 feet) above existing ground surface.

Vehicular access to the Presidio is available from Doyle Drive via the off-ramp to Merchant Road at the Golden Gate Bridge Toll Plaza. Presidio access at the east end of the project area is provided for southbound traffic via a right turn from Richardson Avenue to Gorgas Avenue. Presidio access for northbound traffic at the east end is provided by a slip ramp from Richardson Avenue to Gorgas Avenue.

This alternative incorporates those operational and safety improvements that have been planned and programmed to be implemented by the year 2020. This alternative is required of all federal and state planning guidelines. The No-Build Alternative does not improve the seismic, structural, and traffic safety of the roadway.

Two alternatives with several options that meet the project objectives are proposed, as follows. Note that Alternatives 3 and 4 were eliminated during the course of project development and are thus not included in this *Section 4(f) Evaluation*.

7.2.2 Alternative 2: Replace and Widen

The Replace and Widen Alternative would replace the 463-meter (1,519-foot) long high-viaduct and the 1,137-meter (3,730-foot) long low-viaduct with wider structures that meet the most current seismic and structural design standards. The height of the high-viaduct would vary from 20 to 35 meters (66 to 115 feet) above the ground surface. The low-viaduct would have an average height of approximately ten meters (33 feet) for the No-Detour Option and approximately eight meters (26 feet) for the Detour Option. The new facility would be replaced on the existing alignment and widened to incorporate improvements for increased traffic safety.

This alternative would include six 3.6-meter (12-foot) lanes, a 3.6-meter (12-foot) southbound auxiliary lane with a fixed median barrier, or six 3.6-meter (12-foot) lanes with a moveable median barrier. The new facility would have an overall

width of 38 meters (124 feet). Both options would include continuous three-meter (ten-foot) shoulders along the facility. The fixed median barrier option would require localized lane width reduction to 3.3 meters (11 feet) to avoid impacts to the historic Batteries Slaughter and Blaney and Lincoln Boulevard, reducing the facility width to 32.4 meters (106 feet). At the Park Presidio Interchange, the two ramps connecting southbound Doyle Drive to Veterans Boulevard and the ramp connecting northbound Doyle Drive to southbound Veterans Boulevard would be reconfigured to accommodate the wider facility. The Replace and Widen Alternative would operate similar to the existing facility except that there would be a median barrier and shoulders to accommodate disabled vehicles.

The Replace and Widen Alternative includes two options for the construction staging:

- **No-Detour Option** – The widened portion of the new facility would be constructed on both sides and above the existing low-viaduct and would maintain traffic on the existing structure. Traffic would be incrementally shifted to the new facility as it is widened over the top of the existing structure. Once all traffic is on the new structure, the existing structure would be removed and the new portions of the facility would be connected. To allow for the construction staging using the existing facility, the new low-viaduct would be constructed two meters (six feet) higher than the existing low-viaduct structure.
- **With Detour Option** – A 20.4-meter (67-foot) wide temporary detour facility would be constructed to the north of the existing Doyle Drive to maintain traffic through the construction period. Access to Marina Boulevard during construction would be maintained on an elevated temporary structure south of Mason Street. On- and off-ramps for the mainline detour facility would connect to existing Marina Boulevard/Lyon Street intersection.

Vehicular access to the Presidio is available from Doyle Drive via the on- and off-ramps to Merchant Road at the Golden Gate Bridge Toll Plaza. Presidio access at the east end of the project would be provided for southbound traffic via a planned right turn from Richardson Avenue to Gorgas Avenue. There would be no Presidio access for northbound traffic at the east end of Doyle Drive under Alternative 2 due to geometric constraints and concerns for traffic safety.

Retaining walls would be required at the Park Presidio Interchange to accommodate the ramp realignments. A retaining wall would also be constructed on the south side of the facility along the constrained section between the National Cemetery and the historic batteries.

7.2.3 Alternative 5: Presidio Parkway

The Presidio Parkway Alternative would replace the existing facility with a new six-lane facility and a southbound auxiliary lane, between the Park Presidio Interchange and the new Presidio access at Girard Road. The new facility would consist of two 3.3-meter (11-foot) lanes and one 3.6-meter (12-foot) outside lane in each direction with three-meter (ten-foot) outside shoulders and 1.2-meter (four-foot) inside shoulders. In addition, a 3.3-meter (11-foot) auxiliary lane would run along southbound Doyle Drive from the Park Presidio Interchange to the Girard Road exit ramp. The width of the proposed landscaped median would vary from five meters (16 feet) to 12.5 meters (41 feet). To minimize impacts to the park, the footprint of the new facility would occur largely within the existing facility's footprint east of the Park Presidio Interchange.

A 450-meter (1,476-foot) long high-viaduct would be constructed between the Park Presidio Interchange and the San Francisco National Cemetery. The height of the high-viaduct would vary from 20 to 35 meters (66 to 115 feet) above the ground surface. Shallow cut-and-cover tunnels would extend 240 meters (787 feet) past the cemetery, to east of Battery Blarney. The facility would then continue towards the Main Post in an open depressed roadway with a wide heavily landscaped median.

From Building 106 (Band Barracks), two cut-and-cover tunnels up to 310 meters (984 feet) long would extend to east of Halleck Street. The amount of fill over the tunnels to provide for landscape plantings is being coordinated with the Presidio Trust based on requirements of the *Vegetation Management Plan*. The expected minimum depth is two meters (six feet). The facility would then rise slightly on a low level causeway 160 meters (525 feet) long over the site of the proposed Tennessee Hollow restoration and a depressed Girard Road. The low causeway would rise to approximately four meters (13 feet) above the surrounding ground surface at its highest point. East of Girard Road the facility would return to existing grade north of the Gorgas warehouses and connect to Richardson Avenue. The proposed facility would provide a transition zone starting from the Main Post tunnel to reduce vehicle speeds prior to entering city streets. A motor control and switch gear room to operate the tunnel life safety equipment would be integrated with the Main Post tunnels.

The Presidio Parkway Alternative would include an underground parking facility up to four meters (12 feet) deep at the eastern end of the alignment between the Mason Street warehouses and Gorgas Street warehouses. The parking garage would supply approximately 500 spaces to maintain the existing parking supply in the area and improve pedestrian and vehicular access between the Presidio and the Palace of Fine Arts.

Merchant Road Option - At the intersection with Merchant Road, just east of the Toll Plaza, a design option has been developed for a Merchant Road Slip Ramp. This option would provide an additional new connection from westbound Doyle Drive to Merchant Road. The Merchant Road Slip Ramp Option which would

serve the Golden Gate Bridge facilities, visitor areas and areas of the Presidio such as Fort Scott and Battery East, would require the removal of a row of trees along the north side of Doyle Drive, as well as the removal of the row of apartment buildings along Armistead Road.

The existing Park Presidio Interchange would be reconfigured due to the realignment of Doyle Drive to the south. The exit ramp from southbound Doyle Drive to southbound Veterans Boulevard would be replaced with standard exit ramp geometry and widened to two lanes. The loop of the northbound Doyle Drive exit ramp to southbound Veterans Boulevard would be improved to provide standard exit ramp geometry. The northbound Veterans Boulevard connection to northbound Doyle Drive would be realigned to provide standard entrance ramp geometry. There are two options for the northbound Veterans Boulevard ramp to a southbound Doyle Drive connection:

- **Loop Ramp Option** - Replace the existing ramp with a loop ramp to the left to reduce construction close to the Cavalry Stables and provide standard entrance and exit ramp geometry.
- **Hook Ramp Option** - Rebuild the ramp with a similar configuration as the existing directional ramp with a curve to the right and improved exit and entrance geometry.

The Presidio Parkway Alternative includes two options for providing direct access to the Presidio and Marina Boulevard at the eastern end of the project:

- **Diamond Option** – The Diamond option would provide direct access to the Presidio and indirect access to Marina Boulevard in both directions via new access ramps from Doyle Drive connecting to an extension of Girard Road. East of the new Letterman garage, Gorgas Avenue is a one-way street and connects to Richardson Avenue with access to Palace Drive via a signalized intersection at Lyon Street.
- **Circle Drive Option** – This option would provide direct access to the Presidio and indirect access to Marina Boulevard for southbound traffic via access ramps from Doyle Drive connecting to an extension of Girard Road. Northbound traffic from Richardson Avenue would access the Presidio through a jug handle intersection to Gorgas Avenue.

Retaining walls would be required at the Park Presidio Interchange to accommodate the reconstruction of the ramps. A retaining wall up to eight meters (26 feet) would be constructed along the south side of the facility between the Battery and Main Post tunnels. Retaining walls would also be required in the eastern end of the alignment primarily along the extended Girard Road. Fences would be required along the edge of the at-grade portions of the roadway to restrict pedestrian access onto the roadway.

7.2.4 Preferred Alternative: Refined Presidio Parkway

In response to comments received after release of the DEIS/R, and to address traffic circulation, tidal inundation issues, the elimination of the underground parking below Doyle Drive, the provision of additional surface parking to more closely match the existing condition, while further minimizing the impacts on recreational, historic and cultural resources, the following refinements were made to the Presidio Parkway Alternative (now titled Preferred Alternative: Refined Presidio Parkway).

- The Hook Ramp Option at the Park Presidio Interchange was modified to reuse portions of the existing ramps to reduce impacts to resources while achieving similar improvements to traffic safety.
- In order to simplify construction, a portion of the alignment west of the Battery tunnels was adjusted to accommodate single stage construction of each tunnel structure.
- To reduce disturbance to the existing bluff, the refined alternative would raise the profile of the southbound lanes by up to three meters (ten feet). To further retain the cultural relationship between the upper and lower portions of the Presidio, the landscaping over the Main Post tunnels would recreate the bluff north of the tunnels.
- The accommodation of marsh expansion in the project corridor would subject the proposed facility to coastal events such as storm surge and tsunamis. In order to meet serviceability design criteria the profile would be raised to clear the 100-year tsunami elevation of 3.4 meters (11.1 feet) NAVD88. To accommodate the revised mainline profile, the profile of Halleck Street would be raised by an additional 0.8 meters (2.6 feet) at the north face of Building 228, with the crest of Halleck Street at elevation ten meters (32.8 feet).
- The revised alignment of the mainline created greater separation between the northbound and southbound roadways over the future marsh expansion area, providing an opportunity for increased light penetration to the ground. The additional curvature to the southbound roadway also enhanced the traffic calming impact of the roadway, reducing traffic speeds before reaching city streets.
- By redesigning the Richardson connection as ramps connecting to an urban street, rather than mainline segments, the traffic balance between Richardson Avenue and Marina Boulevard would more closely match the existing condition.
- In conjunction with the realignment of the southbound roadway, the intersection of the off-ramp to Girard Road was moved 20 meters (66 feet) south. This moved the connection along Gorgas Avenue away from the Gorgas Avenue warehouses, preserving the streetscape in front of the buildings.
- The intersection for the northbound on-ramp was also moved 20 meters (66 feet) south. In conjunction with reducing the northbound off-ramp from two

lanes to one lane, much of the landscaping area west of the Palace of Fine Arts was preserved.

- In response to the plans by San Francisco Department of Recreation and Parks (SFDRP) for the rehabilitation of the Palace of Fine Arts and surrounding grounds, the refined alternative would maintain Palace Drive as a two-way road and incorporate the modifications proposed by SFDRP at the north and south ends where Palace Drive connects to Lyon Street. The Preferred Alternative would also maintain Lyon Street as a two-way street with connection to Bay Street.
- To enhance pedestrian safety and accessibility the proposed design would provide pedestrian access under Doyle Drive from the Gorgas warehouses to the Palace of Fine Arts and under Girard Road from the Palace of Fine Arts to the Mason Street warehouses.
- The refinements would include a parking concept that would maintain a parking supply similar to the existing condition. The main features are:
 - elimination of underground parking below Doyle Drive;
 - redesign parking west of Palace Drive and south of Mason Street warehouses as surface parking rather than underground parking;
 - modification to Palace Drive to provide perpendicular parking on both sides of a two-way Palace Drive;
 - provide surface parking behind the Gorgas warehouses; and,
 - provide on-street parking along Gorgas Avenue.

The Doyle Drive Subcommittee to the Citizens' Advisory Committee (CAC), and the Doyle Drive Executive Committee comprised of lead, cooperating and responsible agencies and the Authority CAC all held meetings in July 2006 to consider recommendations for a preferred alternative and design options. All three groups made identical recommendations for selection of the Presidio Parkway incorporating modifications.

The recommendation was Alternative 5, Presidio Parkway, with specific design elements and modifications including the modified Hook Ramp Option for the Presidio Parkway Interchange and the Diamond Option for Presidio Access. Options which were included in Alternative 5 that were eliminated in the Preferred Alternative included:

- Underground parking. Due to improved pedestrian and vehicular circulation achieved with surface parking and the avoidance of potential disturbance to the existing groundwater regime and archaeological impacts, reconfigured surface parking was selected over an underground parking facility.
- Merchant Road Option. Since the additional impacts were considered too great to justify the improved access to Merchant Road, the Merchant Road Option was eliminated. The construction of the slip ramp would take an additional 0.5 hectares (1.2 acres) of parkland, require the removal of four residential buildings along Armistead Road, and increase construction costs

by \$28.1 million. The improvements to weekday PM traffic operations could be achieved through the addition of an all-way stop sign at the northern terminus of Merchant Road and weekend congestion reduced through improvements to the Golden Gate Bridge visitors' parking lot.

- Loop Ramp Option. Due to the increased impacts to biological resources and intrusion into scenic vistas, the Loop Ramp Option at the Park Presidio Interchange was eliminated. Careful design of the ramp connecting northbound Veteran Boulevard to southbound Doyle Drive minimized any impacts to Cavalry Hollow; therefore, the take of an additional 0.6 hectares (1.4 acres) to construct the Loop Ramp Option was not justified.
- Circle Drive Option. Since the development of the Circle Drive Option as presented in the DEIS/R, the SFDRP advanced their plans for the rehabilitation of the Palace of Fine Arts and identified the need to retain Palace Drive as a two way street. Although many configurations were developed, the Circle Drive Option remained incompatible with a two-way Palace Drive. Residents along Lyon Street were also adamant that Lyon Street should remain as a two-way Street. In addition, the construction of Circle Drive would require the removal of Building 1151, the historic pool building. Since the refined Diamond Option accommodates a two-way Palace Drive and Lyon Street and retains the pool building, the Circle Drive option was eliminated.

In addition to these recommendations and modifications, the subcommittee voted to support three design refinements:

- move Girard Road intersection south;
- restrict Lyon Street connection for the Presidio; and
- reserve additional right of way for the connection from Marina Boulevard to Doyle Drive.

The following is the description of the Preferred Alternative, incorporating the modifications. A more detailed discussion of the project alternatives, including exhibits, can be found in Chapter 2 of this FEIS/R. Detailed drawings showing the plan and profile of the Preferred Alternative in addition to the various design options can be found in **Appendix B**.

The Refined Presidio Parkway Alternative would replace the existing facility with a new six-lane facility and a southbound auxiliary lane, between the Park Presidio Interchange and the new Presidio access at Girard Road. (See **Exhibit 2-31**)

The new facility would consist of two 3.3-meter (11-foot) lanes and one 3.6-meter (12-foot) outside lane in each direction with three-meter (ten-foot) outside shoulders and 1.2-meter (four-foot) inside shoulders. The southbound direction would include a 3.3-meter (11-foot) auxiliary lane from the Park Presidio Interchange to the Girard Road exit ramp. The width of the proposed landscaped median would vary from five meters (16 feet) to 12.5 meters (41

feet). To minimize impacts to the park, the footprint of the new facility would overlap with a large portion of the existing facility's footprint east of the Park Presidio Interchange.

7.3 Description of Section 4(f) Properties

This section describes the *Section 4(f)* properties that would be subject to *Section 4(f)* use by the proposed build alternatives, including the Preferred Alternative. These properties include:

- the Presidio NHLD;
- Doyle Drive;
- the Golden Gate Bridge;
- Marina Viaduct;
- the Presidio Viaduct; and
- Palace of Fine Arts.

Exhibit 7-2 on the following page provides a listing of the resources in proximity to Doyle Drive construction.

7.3.1 The Presidio

The Presidio of San Francisco, a publicly owned recreational area and historic property is located in the northwestern most point of San Francisco peninsula. The property is approximately 600 hectares (1,480 acres) in size and is both a national park and National Historic Landmark District (NHLD). The existing Doyle Drive corridor encompasses 9.1 hectares (22.5 acres) of the property.

**Exhibit 7-2
Section 4(f) Resources**

RESOURCE	HISTORIC RESOURCES / RECREATIONAL ELEMENTS IN PROXIMITY TO DOYLE DRIVE CONSTRUCTION
PRESIDIO OF SAN FRANCISCO	RECREATION RESOURCES
	Proposed Trail and Bikeway Connections (<i>Presidio Trails and Bikeways Plan</i>) <ul style="list-style-type: none"> • Proposed Presidio Promenade • Proposed Park Boulevard Trail • Proposed Tennessee Hollow Corridor Other Recreation Facilities <ul style="list-style-type: none"> • Building 1151 – Indoor Swimming Pool • Building 1152 - Gymnasium
	HISTORIC RESOURCES (BY PLANNING DISTRICT)
	Fort Scott Planning District <ul style="list-style-type: none"> • Buildings 966 and 967 Crissy Field Planning District <ul style="list-style-type: none"> • Stables Area Buildings: 661, 662, 663, 667, 668, 669, 670, and 671 • Stilwell Hall: Building 650 • Building 631 • Crissy Center: Building 603 • Mason Street Warehouses: Buildings 1182, 1183, 1184, 1185, 1186, 1187, and 1188 South Hills Planning District <ul style="list-style-type: none"> • National Cemetery and Its Buildings: 150, 151, 152, 153, and 154 Main Post Planning District <ul style="list-style-type: none"> • Main Post, Vicinity of Main Parade Ground: 105, 106, 107, 108, and 210 • Main Post, Vicinity of Halleck Street: 201, 204, 227, 228, and 230 Letterman Planning District <ul style="list-style-type: none"> • Buildings 1056, 1059, 1060, 1061, 1063, and 1076 • Gorgas Ave Warehouses: 1160, 1161, 1162, 1163, 1167, 1169, and 1170 • Buildings 1151 and 1152
DOYLE DRIVE	<ul style="list-style-type: none"> • Presidio Viaduct • Marina Viaduct
GOLDEN GATE BRIDGE	Golden Gate Bridge Doyle Drive – Historic Component <ul style="list-style-type: none"> • Presidio Viaduct (High-viaduct) • Marina Viaduct (Low-viaduct)
MARINA VIADUCT	<ul style="list-style-type: none"> • Marina Viaduct
PRESIDIO VIADUCT	<ul style="list-style-type: none"> • Presidio Viaduct
PALACE of FINE ARTS and EXPLORATORIUM	<ul style="list-style-type: none"> • Palace of Fine Arts

Access to the Presidio is provided at the following locations: Lincoln Boulevard (at the southwest), Arguello Boulevard (at the south), Presidio Boulevard and Broadway (at the southeast), Lombard Street and Gorgas Avenue (at the east), and Marina Boulevard (at the northeast). Vehicular access to the Presidio is also available from Doyle Drive via the off-ramp to Merchant Road at the Golden Gate Bridge Toll Plaza. Highway 101, crosses through the northern part of the Presidio where, from the Toll Plaza to the eastern boundary of the Presidio. It is known as Doyle Drive (or the South Access to the Golden Gate Bridge). Veterans Boulevard carries Highway 1 on a north-south alignment through the Presidio NHLD and intersects with Doyle Drive just northwest of the Cavalry Stables buildings. These two major roadways were built in the 1930s and they and their associated structures are contributing elements of the Presidio NHLD, and are therefore subject to *Section 4(f)*.

Park and Recreational Resources

Park Administration

In 1998, management of the Presidio was divided between two federal agencies: the Presidio Trust and the National Park Service (NPS). The Trust is responsible for oversight of 80 percent of the Presidio delineated as Area B (see **Exhibit 7-1**); and the NPS is responsible for management of the coastal portions of the park (the remaining 20 percent) that are delineated as Area A (see **Exhibit 7-1**). The Doyle Drive Project is located in Area B.

The Trust's mission is to preserve and enhance the natural, cultural, scenic and recreational resources of the Presidio for public use in perpetuity, and to achieve long-term financial sustainability. The Trust expects to receive federal appropriations until 2013, at which time they must be financially self-sustaining.

The Trust uses these funds and lease revenues to rehabilitate the park's buildings, restore its open spaces and historic resources, provide public programs, and maintain utilities and infrastructure.

The Presidio is a unit of Golden Gate National Recreation Area (GGNRA), which is comprised of many locations in the Bay Area including Alcatraz, Marin Headlands, Fort Funston, Fort Mason, as well as Muir Woods National Monument, Fort Point National Historic Site, and the Presidio of San Francisco.

The GGNRA, the world's largest urban national park, covers a total area of 30,513 hectares (75,398 acres) of land and water, including approximately 45 kilometers (28 miles) of coastline.

Park and Recreational Resources

The Presidio provides a unique experience for visitors to an urban park. Recreational facilities within the Presidio include a golf course, a swimming pool, volleyball, basketball, and tennis courts, a gymnasium, a bowling center, several small playgrounds, athletic fields, picnic areas, and a group camping area.

Along the Presidio's approximately 60 kilometers (37 miles) of trails, recreational activities include walking, jogging, biking, sightseeing and bird watching. On the waterfront, visitors can surf and windsurf, sail, fish, and swim. The *Presidio Trails and Bikeways Plan & Environmental Assessment* is the guide for directing the establishment of a network of trails and bikeways which would enhance the public's exploration and experience of the Presidio while also protecting its natural and cultural resources. The plan identifies three basic trail classifications: pedestrian trails, multi-use trails and on-street bikeways.

Recreational facilities located within the Doyle Drive Project study corridor include an indoor swimming pool (Building 1151), a gymnasium building (Building 1152) and portions of the existing and proposed trail and bikeway network. These two buildings are also contributing elements to the NHLD and are discussed in greater detail in the historic resources discussion below.

Proposed Recreational Trail Improvements

Proposed trail and bikeway connections that may have impacts as a result of the Doyle Drive Project include the Presidio Promenade, the Park Boulevard Trail and the Tennessee Hollow corridor. Within the Presidio Promenade improvements include a continuous sidewalk route and bike lanes. Near the Cavalry Stables, the bike lanes separate using Patten Road for the westbound bike lane and Lincoln Boulevard for the eastbound bike lane. Subject to planning review and approval, Crissy Field Avenue is planned to serve as a two-way multi-use path with no automobile traffic. **Exhibit 7-3** shows the portion of this planned trail within the Construction Area of Potential Effect (APE) that would be affected during the construction period of the proposed project.

The planned Park Boulevard multi-use trail would connect Mountain Lake with the Presidio and Golden Gate Promenades. The plan would include improvements to the Mountain Lake trailhead, bike lanes on both sides of Park Boulevard between Washington and Lincoln Boulevards and bike lanes on both sides of McDowell Avenue. **Exhibit 7-3** shows the portion of this planned trail within the Construction APE that would be affected during the construction period of the Doyle Drive Project.

The planned Tennessee Hollow corridor would connect recreational areas to the south side of the Presidio through the Tennessee Hollow watershed to the restored Crissy Marsh. The proposed improvements include trailheads at Julius Kahn Playground, Lincoln Boulevard near Funston Avenue, Halleck Street at Mason Street, and Crissy Field Beach; a new trail corridor developed in coordination with Tennessee Hollow restoration plans; a connection to the

Exhibit 7-3
Trails and Bicycle Connections in the Presidio



Golden Gate Bridge Promenade and Crissy Field Beach trailhead via the existing pedestrian trail; spur trails with overlooks to view wetland and riparian environments; and upgrades to Halleck Street to include bike lanes on both sides of the street, if feasible. **Exhibit 7-3** shows the portion of this planned trail within the Construction APE that would be affected during the construction period of the proposed project.

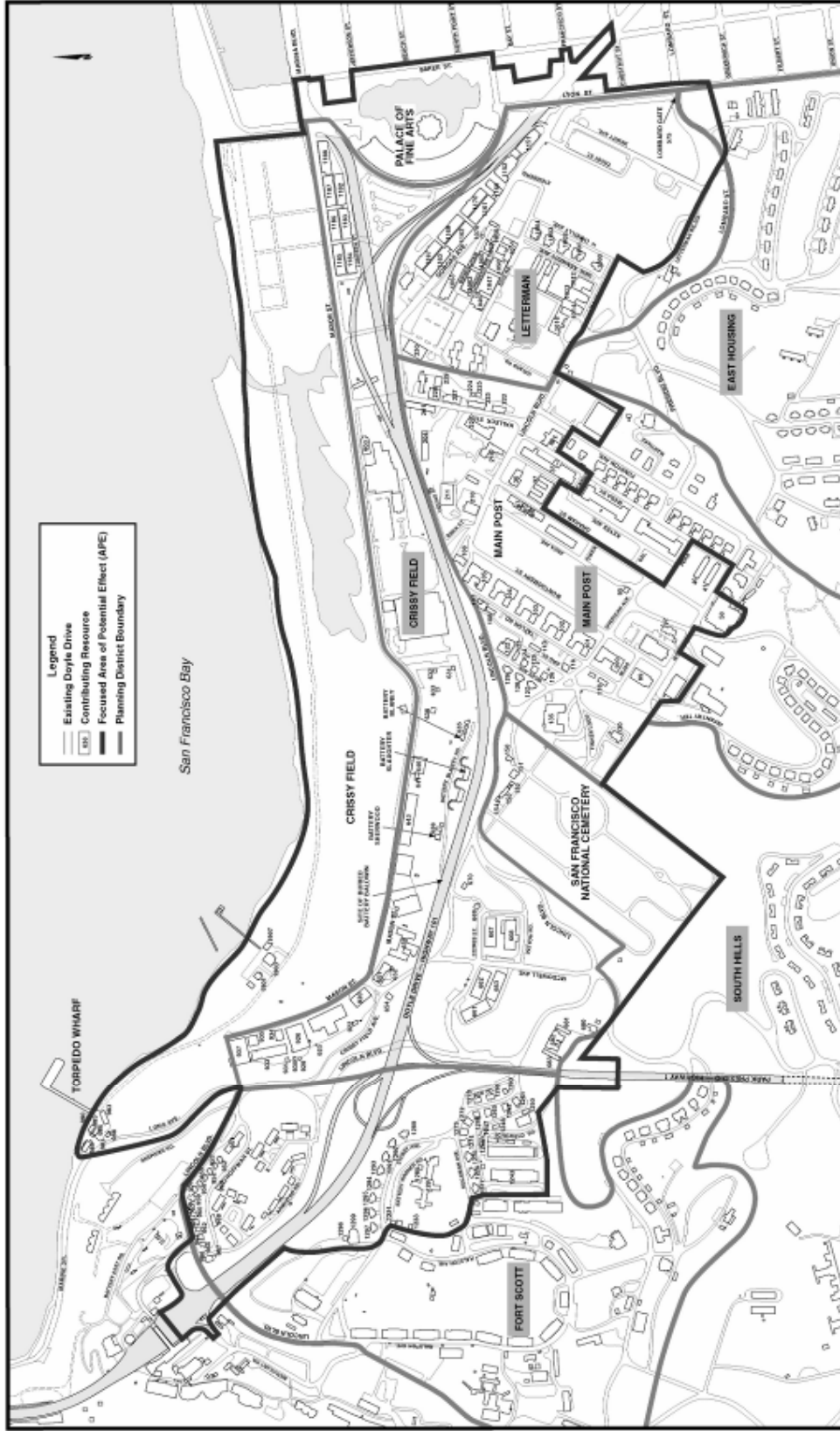
Historic Resources

Due to its unique role in the military and colonial history of the West, the entire Presidio (Areas A and B) (see **Exhibit 7-1**) was designated as a NHLD in 1962 and listed in the National Register of Historic Places (NRHP) in 1966. The boundaries of the Presidio NHLD are those of the old Army post.

The Focused Area of Potential Effect (APE) within the Presidio NHLD is comprised of approximately 280 historic-era resources including buildings, structures, objects and sites that together make up a cultural landscape. These and other elements together contribute to the cultural landscape found in the Presidio and are considered to be contributing resources to the Presidio NHLD. The “Focused APE” refers to the area that encompasses the portion of the NHLD that has potential for actual impacts from the project. Elements that are features of the cultural landscape include circulation systems, building clusters, buildings, structures, objects, and vegetation from the period of significance (1776 to 1945). Because of the interrelationships of the elements there is a potential for alteration of the cultural landscape should any element within the landscape be altered or a new non-historic feature be introduced into the landscape. In addition to the individually listed or eligible properties in the architectural Focused APE, **Appendix D** in this FEIS/R provides a list of the contributors to the NHLD that are in the Focused APE.

To provide a context for the discussion of impacts (Section 7.4), a description of the NHLD contributing elements within the Focused APE (see **Exhibit 7-4**) that are affected by any of the build alternatives follows in this section from west to east by planning district, as established in the *Presidio Trust Management Plan* (PTMP). Within the descriptions, the resources also are organized by groups or clusters and by their general location. For a more detailed discussion of the contributing resources within the project corridor, see the Cultural Resources Section in Chapter 3 of the FEIS/R.

Exhibit 7-4
Presidio NHD Contributing Buildings, Structures, and Objects within the Doyle Drive Corridor



Crissy Field Planning District

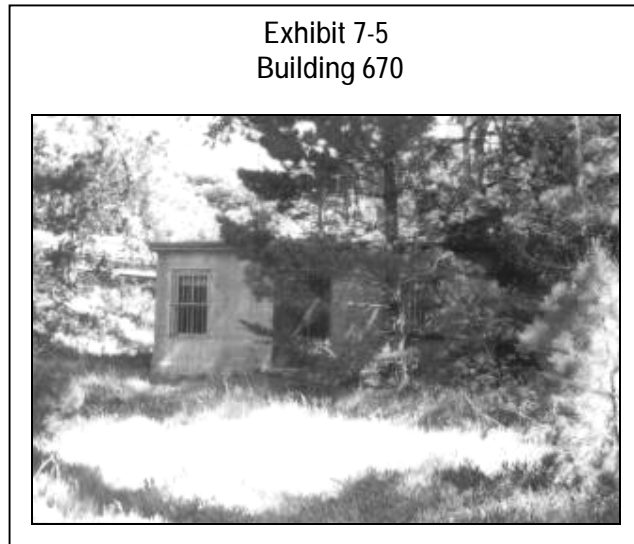
Stables Area Building 670

The stables cluster is located in a small, bowl-shaped valley that is west of the National Cemetery and east of the Fort Scott enlisted family quarters.

Several small buildings are located east of the stable buildings.

The small storehouse Building 670 (see **Exhibit 7-5**), built in 1921, is located in the farther northeast portion

of the cluster. Building 670's character-defining features are its apparent densely built unadorned reinforced concrete construction and the ironwork applied to its window and door openings, which were related to its chemical storage function.



Mason Street

Warehouses: Buildings 1182, 1183, 1184, and 1185

Buildings 1182, 1183, 1184, and 1185 (see **Exhibit 7-6**) are warehouses built as part of the development of the North Cantonment into a major supply depot between 1917 and 1919. The character-defining features of these World War I-era warehouses are their unified “temporary”

warehouse layout, their utilitarian wood frame construction, and elongated design. When Doyle Drive was built in the 1930s as the approach to the Golden Gate Bridge, the Marina Viaduct was built just south of and parallel to the south sides of Buildings 1182, 1183 and 1184. This separated them from other warehouses on Gorgas Avenue built during the same period.



Main Post Planning District

Main Post, Vicinity of Halleck Street: 201, 204, 228 and 230

Buildings 201 and 204 (see **Exhibit 7-7** and **Exhibit 7-8**) were constructed to serve Post Exchange functions in 1896. Both are long narrow wood frame warehouses and construction type of “temporary” design for their time. Both exhibit utilitarian designs of their period with some contemporary alterations. Building 201 is one story along the west side of Halleck Street and two stories on its west side. Building 204 is two stories.

Building 228 (see **Exhibit 7-9**), was built in 1909 to house a bakery. Its character-defining features include the continued use of brick construction seen on Halleck Street and during this era on the Presidio.

Building 230 (see **Exhibit 7-10**) is a one-story, wood frame building that was built in 1917 during the

Exhibit 7-7
Main Post, Vicinity of Halleck Street, Building 201



Exhibit 7-8
Main Post, Vicinity of Halleck Street, Building 204



Exhibit 7-9
Main Post, Vicinity of Halleck Street, Building 228



development as a major supply depot at the Main Post. Its character-defining features are in its simple utilitarian design and simple wood construction.

Letterman Planning District

Building 1151

Building 1151 (see **Exhibit 7-11**) is a World War II-era recreation building, constructed at the end of a row of World War I-era warehouses. It is a tall reinforced concrete building, constructed in 1945 to

house an indoor swimming pool (1151) adjacent to a gymnasium (1152). The character-defining features of the buildings includes their reinforced concrete materials, the use of large windows that was appropriate for their recreational uses, and modern design elements on Building 1151, characteristic of the period. Although Building 1151 was

built late in the period of significance for the landmark, it was identified as a contributor because it is associated with the “continuing importance and activity of the Post, and specifically Letterman Hospital during the World War-II era.”¹

Roadways

Portions of the following roadways are within the project corridor. Roadways contribute to the cultural landscape with defined circulation characteristics which support and contribute to the historic development and spatial organization within the NHLD. Only those portions within the expanded right of way of the

Exhibit 7-10
Main Post, Vicinity of Halleck Street, Building 230



Exhibit 7-11
Buildings 1151 and 1152



¹ NPS, “Presidio ... Registration Forms,” 7-171.

alternatives, or proposed for modification as part of the proposed project, would be subject to *Section 4(f)*.

Veterans Boulevard (Route 1)

All freeways lead onto the most significant city streets, thus leaving Route 1 and Route 101 to use city streets (such as 19th Avenue and Van Ness Avenue) to cross the city. Constructed in the 1930s, Route 1 in the Doyle Drive project area traverses the Fort Scott Planning District and connects to Doyle Drive (Route 101) at an interchange just northwest of the Cavalry Stables.

Richardson Avenue (Route 101)

Route 101 enters the city of San Francisco from the south as a freeway, but it quickly changes to a city street (Van Ness Avenue and Lombard Street) as it passes through the city. In the Doyle Drive project area, Lombard Street turns into Richardson Avenue as it nears the Presidio. Richardson Avenue connects to Doyle Drive as it heads west toward the Golden Gate Bridge.

Bank Street

Bank Street (not given a number in the National Historic Landmark [NHL] nomination), is a service road that goes up the bluff and connects to Lincoln Boulevard, west of the Guard House (Building 210). Bank Street appears on maps as early as 1934.

Battery Blaney Road

A remnant of unpaved Battery Blaney Road exists between Batteries Blaney and Sherwood. The alignment of this service road to the batteries was altered during the construction of Doyle Drive.

Cowles Street

McDowell Avenue, Patten Road, Incinerator Road and Cowles Street were all built in 1912 in conjunction with the construction of the stables cluster. Cowles Street provides for circulation between the stables and has an east-to-west orientation. Cowles Street is located south of Buildings 662 and 667.

Crissy Field Avenue

Crissy Field Avenue was built in 1920 as part of the construction of the airfield facilities. It connected several functional areas of the Presidio: the Main Post, the stables area, the Stilwell Hall complex, and the Crissy Field maintenance buildings. It also provided a shorter route between the Main Post and the Lincoln Boulevard housing area. Crissy Field Avenue begins on the east side at Lincoln Boulevard, just before it curves south of the stable area. It continues down the bluff, just south of Doyle Drive, goes under Doyle Drive and behind Stilwell Hall, and then continues up the bluff to Lincoln Boulevard, on the west

side. There is a stone retaining wall located on its south side for the portion of the road between Stilwell Hall and Lincoln Boulevard.

Girard Road

The remains of the Letterman Medical Center pavilion cluster that housed the administrative, clinic and ward buildings are bounded on the southwest by Torney Avenue built in 1912), on the northwest by Girard Road (built in 1902), on the northeast by Edie Road (built in 1902), and the southeast by General Kennedy Avenue (built in 1902).

Gorgas Avenue

Gorgas Avenue (built in 1920) runs along the back (northeast) side of the service and supply buildings. A row of warehouses and the indoor swimming pool and gymnasium are located on the northeast side of Gorgas Avenue. There is a secondary entrance or service entrance to the Presidio at the intersection of Gorgas and Lyon. On the west end, Gorgas Avenue intersects Halleck Street.

Halleck Street

Halleck Street (see **Exhibit 7-12**) is located to the northeast of the Parade Ground area. The corridor for this street dates from at least 1885. Halleck Street begins at Lincoln Boulevard and continues north to its intersection with Mason Street. This street served as a service corridor and provided a transition corridor between the Main Post's administrative and residential functions and the utilitarian and supply activities of the Lower Post Area. Located along the east side of the street are several warehouses and two bakery-related buildings. On the west side of the street, on the lowland side of the bluff, are two early exchange buildings. Halleck Street spans the bluff area and provides a physical transition from the higher ground above the bluff, over the bluff, and down to the lowland on the north side of the bluff.



Lincoln Boulevard

Lincoln Boulevard provided the primary access to this portion of the Presidio from the Main Post before the construction of Fort Scott in 1910 to 1912. The road followed the plateau along the bluff and peninsula's point on the north. This area was the general location of a road corridor that connected the Main Post to the Castillo during the Spanish and Mexican periods. After the construction of Fort Scott, Lincoln Boulevard linked the Fort to the Main Post, which provided the primary access to the Fort on its east and west sides, and provided the access to the series of batteries along the west coastline. It continues to provide this access today. The vertical and horizontal alignment of Lincoln Boulevard is a character-defining feature of the road in this area.

Vallejo Street

In the Crissy planning area, a short section of Vallejo Street remains. This street begins at Halleck, runs along the south side of the Commissary and ends in the parking lot of the Commissary/Post Exchange complex.

7.3.2 Doyle Drive

Doyle Drive, a publicly owned historic resource, is the south approach to the Golden Gate Bridge and carries Route 101 through the Focused APE, on an east-west alignment through the northern portion of the Presidio NHL.

Doyle Drive runs from the Palace of Fine Arts on the east, westward to the Toll Plaza of the Golden Gate Bridge. The two viaduct structures that comprise a portion of Doyle Drive are listed as the Marina Viaduct (Bridge 34-0014) (see **Exhibit 7-13**) and Presidio Viaduct (Bridge 34-0019) (see

Exhibit 7-13
Presidio Viaduct



Exhibit 7-14
Marina Viaduct



Exhibit 7-14) in the *California Log of Bridges on State Highways*.

Doyle Drive is an historic resource, individually eligible for the NRHP. It is also a contributing element to the NHLD and to the Golden Gate Bridge property.

7.3.3 Golden Gate Bridge

The Golden Gate Bridge is one of the most well known, internationally recognized, and frequently visited suspension bridges in the world. Located at the mouth of San Francisco Bay, the bridge spans the Golden Gate Strait, from Fort Point at the northwestern tip of the San Francisco Peninsula to Lime Point at the southeastern end of the Marin Headlands, east of Fort Baker. This property is a publicly owned historic resource.

The Golden Gate Bridge is a linear property that is just north of the Focused APE for this project. Doyle Drive, a contributing element of the Golden Gate Bridge, is located within the Focused APE is Doyle Drive.

In 1997, the NPS prepared a National Historic Landmark (NHL) nomination for the Golden Gate Bridge. In this nomination, Doyle Drive is recognized as a contributor to the Golden Gate Bridge property, as well as being a contributor to the Presidio NHLD because it is functionally and aesthetically integral to the Golden Gate Bridge. As of September 2008, the Golden Gate Bridge had not been submitted for designation as a National Historic Landmark. The Golden Gate Bridge was determined eligible for listing on the NRHP in 1980, and was designated as California State Historic Landmark No. 974 in 1990.

This property also provides a recreational function with visitor facilities, lookout areas and the bridge proper being used by bicyclists, joggers and sightseers.

7.3.4 Marina Viaduct

The Marina Viaduct, a publicly owned historic resource, (Bridge 34-0014) was determined to be a property individually eligible for the NHRP in 1987. This structure, which is part of the existing Doyle Drive, discussed above, is also a contributing element to the Golden Gate Bridge and the Presidio NHLD.

7.3.5 Presidio Viaduct

The Presidio Viaduct, a publicly owned historic resource, (Bridge 34-0019) was determined to be a property individually eligible for the NHRP in 1987. This structure which is part of the existing Doyle Drive, as discussed above, is also a contributing element to the Golden Gate Bridge and the Presidio NHLD.

7.3.6 Palace of Fine Arts

The Palace of Fine Arts is a reconstruction of an exhibit space and outdoor recreation area that was built between 1914 and 1915 as part of the Panama-Pacific International Exhibition, or PPIE. The PPIE was a World's Fair commemorating the opening of the Panama Canal. The city of San Francisco

rebuilt the structure in the 1960s, which is now under the jurisdiction of the San Francisco Department of Recreation and Parks.

This 6.5-hectare (15.7-acre) property is bounded on the north, west and southwest by Doyle Drive access: one from Marina Boulevard and one carrying Route 101 from Richardson Avenue. The approaches are adjacent to, but do not intersect with, the boundary of the Palace of Fine Arts property.

This Palace is designated a San Francisco Historic Landmark and in December 2005 was listed in the NRHP by the Keeper of the National Register. The contributing features of the historic property are the lagoon and landscaping, the rotunda, and the colonnade. In addition to its historic landmark status, the Palace and its grounds serve a recreational function, with visitors using the lawns and walking along the lagoon and viewing the Palace of Fine Arts.

7.4 Other Parks and Recreation Facilities Evaluated

The purpose of this discussion is to address *Section 4(f)* requirements relative to other publicly owned park, recreational facilities, wildlife refuges and historic properties in the project vicinity. Typically the discussion of other resources documents the following:

- Why the resource is not protected by the provisions of *Section 4(f)*, or
- If it is protected by *Section 4(f)*, why none of the alternatives under consideration causes a *Section 4(f)* use by:
 - *permanently incorporating land into the project;*
 - *temporary occupancy of land that is adverse to the preservationist; purposes of Section 4(f);*
 - *constructive use of land from the resource.*

Relative to this project, those properties that would be used by any of the build alternatives have been previously discussed. There are no wildlife refuges in the project vicinity. There is one other park in the vicinity of the project, the Marina Green which is discussed below.

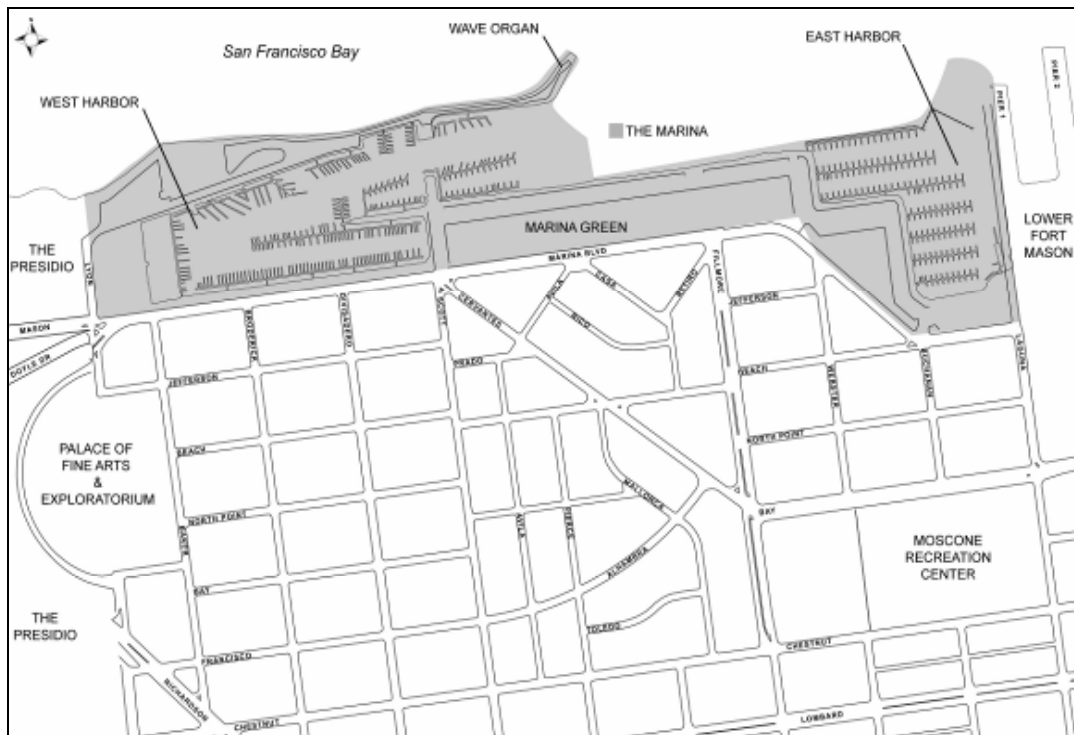
The Marina Green

The Marina Green is located on the northern waterfront of San Francisco and is under the jurisdiction of the San Francisco Recreation and Park Department (see **Exhibit 7-15** on the following page). This park is located immediately adjacent to the Presidio and the project area. This is a very popular recreational resource used for running, boating, and swimming. The Marina Green consists of a long grassy promenade bound by San Marina Boulevard on the south, San Francisco bay on the north, Scott Street and the West Harbor on the west, and Webster Street and the East Harbor on the east.

The potential for impacts to the Marina Green were considered in the alternatives development process. No physical use of this property would occur from any of the build alternatives. Indirect impacts that could cause a

constructive use, such as noise, air quality and visual impacts were also assessed. It was determined that this project would not introduce changes of an external nature that would affect the recreational function of this property. For the reasons discussed above, the provisions of *Section 4(f)* are not triggered.

Exhibit 7-15
The Marina Green



Source: San Francisco Enterprise GIS

7.5 Impacts on the Section 4(f) Properties

Section 7.3 identified the six properties that would be used by any of the build alternatives, including the Preferred Alternative. This section discusses the specific features of the *Section 4(f)* properties that would be affected by these alternatives. It should be noted that the Marina Viaduct and the Presidio viaduct, although individually eligible for the NHRP, are also contributing elements to the three other *Section 4(f)* properties that would be used: the Presidio NHL, the Golden Gate Bridge, and Doyle Drive.

7.5.1 The Presidio NHL

The Doyle Drive Project's build alternatives would require additional right of way interest² within the Presidio to construct, operate and maintain the facility. The right of way requirements for each alternative and their options are shown in **Exhibit 7-16**. The existing grant of right of way by permit for Doyle Drive occupies approximately 9.5 hectares (23.5 acres) within the Presidio.

Exhibit 7-16
Land Required for Permanent Right of Way for Project Alternatives

ALTERNATIVE	TOTAL AREA OF PERMANENT RIGHT OF WAY REQUIRED	INCREASE FROM EXISTING RIGHT OF WAY
<i>NO-BUILD</i>		
	9.5 hectares (23.5 acres)	None
<i>REPLACE AND WIDEN</i>		
ALTERNATIVE 2: NO-DETOUR	10.4 hectares (25.7 acres)	0.9 hectares (2.2 acres)
ALTERNATIVE 2: DETOUR	10.1 hectares (24.9 acres)	0.6 hectares (1.5 acres)
<i>PRESIDIO PARKWAY</i>		
ALTERNATIVE 5: WITH CIRCLE DRIVE	Loop Ramp	14.0 hectares (34.6 acres)
	Hook Ramp	13.4 hectares (33.1 acres)
ALTERNATIVE 5: WITH DIAMOND INTERCHANGE	Loop Ramp	14.1 hectares (34.8 acres)
	Hook Ramp	13.6 hectares (33.4 acres)
ADDITION OF MERCHANT ROAD SLIP RAMP	0.7 hectares (1.7 acres)	0.5 hectares (1.2 acres)
PREFERRED ALTERNATIVE – REFINED PRESIDIO PARKWAY	11.7 hectares (29.0 acres)	2.6 hectares (6.4 acres)

Source: Parsons Brinckerhoff, September 2005, October 2006.

Recreational Resources

Under all of the build alternatives, recreational resources in the Presidio would be subject to temporary use during construction and actual use from right of way expansion.

² Doyle Drive is owned and maintained by Caltrans on a grant of right of way by permit from the Federal Government. Caltrans would need to obtain an additional right of way interest from the Trust to construct any of the build alternatives.

Alternative 2: Replace and Widen – With Detour Option

Land Requirements

This alternative would require the use of 10.1 hectares (24.9) acres of land.

Bicycle and Pedestrian Access

Bicycle and pedestrian access at all locations throughout the study area would be maintained during the construction period. Construction activities would require some nighttime closures of roadways and paths which traverse the project corridor and an approximate three month closure of Lincoln Boulevard near the National Cemetery. Bicycle and pedestrian traffic on the existing trails such as the Park Boulevard Trail and Presidio Promenade Trail would require temporary detours during the brief closures. These nighttime and occasional closures would not be of sufficient durations as to create a temporary use as defined under *Section 4(f)*. There would be no affects to the Tennessee Hollow Trail as it would be developed after completion of the project. Trail and bikeway connections are shown in **Exhibit 7-17** on the following page.

Recreational Facilities

No buildings housing recreational facilities would be removed by this alternative.

Alternative 2: Replace and Widen - No-Detour Option

This alternative would require the use of 10.4 hectares (25.7 acres) of land. Impacts to bicycle and pedestrian access and recreational facilities would be the same as discussed above for the With Detour option.

Alternative 5: Presidio Parkway – Diamond Option

Land Requirements

This alternative would require the use of 14.1 hectares (34.8 acres) of land with the Loop Ramp Option and 13.6 hectares (33.4 acres) with the Hook Ramp Option.

Because this alternative includes the construction of tunnels, land remaining above the tunnels could be made available for open space. The open space would also open up vistas within the Presidio that are currently obstructed by the low-viaduct.

Bicycle and Pedestrian Access

This alternative under all options would provide improved pedestrian access and allow connections between the Main Post and Crissy Field, as well as provide pedestrian access along Girard Road from Marina Boulevard and Mason Street to the Main Post. Bicycle and pedestrian crossings would also be facilitated at new signalized intersections at Girard and Gorgas Avenues.

Exhibit 7-17
Trail and Bikeway Connections

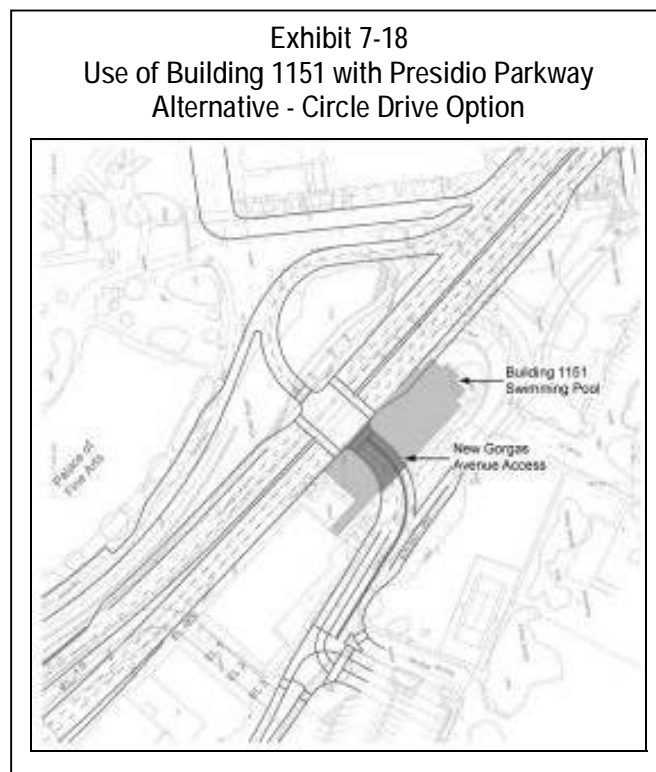


The alternative would not permanently affect existing and planned trail corridors located in the vicinity of Doyle Drive including the Tennessee Hollow Trail, Park Boulevard Trail, or Presidio Promenade Trail. The existing trails would be affected only on a temporary basis during the construction, and the occasional closures would not be of sufficient durations as to create a temporary use as defined under *Section 4(f)*. Closures would range from a couple of days for the Park Boulevard Trail to three to six months for the Presidio Promenade Trail. Detours would be provided during the closure periods. There would be no affects to the Tennessee Hollow Trail as it would be developed after completion of the project.

Under the Presidio Parkway Alternative, bicycle and pedestrian access would be closed along Bank Street from the Main Post to the Commissary parking area until the Main Post tunnels are built. While Halleck Street is closed, it is anticipated that bicycle and pedestrian access from Crissy Field to the Main Post would be maintained via Marshall Street.

Alternative 5: Presidio Parkway - Circle Drive Option

This alternative would require the use of 14.0 hectares (34.6 acres) of land with the Loop Ramp Option and 13.4 hectares (33.1 acres) with the Hook Ramp Option. In addition to all of the impacts described above, the Circle Drive Option would require the removal of Building 1151 (YMCA pool) (**Exhibit 7-18**). The option would provide new access to Gorgas Avenue from the southeast, crossing Richardson Avenue and bisecting the Building 1151 to enter Gorgas Avenue and the Presidio



Alternative 5: Presidio Parkway - Merchant Road Slip Ramp Option

No buildings housing recreational facilities would be affected by constructing the slip ramp under Alternative 5.

Preferred Alternative – Refined Presidio Parkway

This alternative would require the use of 11.7 hectares (29.0 acres) of land. Impacts to bicycle and pedestrian access and recreational facilities would be similar to those discussed under Alternative 5: Presidio Parkway – Diamond Option.

Historic Resources

Section 3.0 of this chapter identified those properties that would be used by any of the build alternatives. This section identifies and discusses the specific features of the *Section 4(f)* properties that would be affected by these alternatives. The right of way requirements were discussed in the preceding section. **Exhibit 7-19** identifies the resources in the corridor by number and states how features within the *Section 4(f)* property would be affected.

Temporary Removal — Removal would involve jacking a structure up from its foundation, placing it on rollers and moving it to a temporary location during construction and then replacing it in the same location on new foundations after construction is complete. This type of action would result in a temporary use under *Section 4(f)* definitions.

Removal — Removal, which would constitute a permanent impact, would involve the permanent removal of a structure. This type of action would result in an actual use under *Section 4(f)* definitions.

The Presidio

Under all of the build alternatives, a use of the NHLD would occur, which would result in the removal of buildings, structures, alterations to the cultural landscape and changes to contributing roadways. **Exhibit 7-19** provides a summary of potentially affected buildings and roadways that may be affected.

Exhibit 7-19
Actions Causing Section 4(f) Use of NHL¹ Resources

		ALTERNATIVES						
		REPLACE AND WIDEN		PRESIDIO PARKWAY				
Number of Element	Name of Element	No-Detour	With Detour	With Diamond Interchange	With Circle Drive	Merchant Road Slip Ramp ²	Preferred	
CONTRIBUTING (NHL¹) BUILDINGS								
Building 201	Exchange Store	No Use	No Use	Removal	Removal	No Use	Removal ³	
Building 204	Exchange Store (Presidio Thrift Shop)	No Use	No Use	Removal	Removal	No Use	Removal	
Building 230	Warehouse	No Use	No Use	Removal	Removal	No Use	Removal	
Building 670	Chemical Storehouse	No Use	No Use	Removal	Removal	No Use	Removal	
Building 1151	Presidio YMCA Pool	No Use	No Use	No Use	Removal	No Use	No Use	
Warehouse 1182	Mason Street Warehouse	No Use	Temporary Removal	No Use	No Use	No Use	No Use	
Warehouse 1183	Mason Street Warehouse	No Use	Temporary Removal	No Use	No Use	No Use	No Use	
Warehouse 1184	Mason Street Warehouse	No Use	Temporary Removal	No Use	No Use	No Use	No Use	
Warehouse 1185	Mason Street Warehouse	No Use	Temporary Removal	No Use	No Use	No Use	No Use	
CONTRIBUTING (NHL¹) ROADWAYS								
none	Doyle Drive	Permanently Removed	Permanently Removed	Permanently Removed	Permanently Removed	Permanently Removed	Permanently Removed	
none	Veterans Boulevard (Route 1)	Alteration	Alteration	Alteration	Alteration	Alteration	Alteration	
none	Richardson Avenue (Route 101)	No Use	No Use	Alteration	Alteration	No Use	Alteration	
2009	Bank Street	No Use	No Use	Alteration	Alteration	No Use	Alteration	
2012	Battery Blaney Road	Alteration	Alteration	Alteration	Alteration	No Use	Alteration	
2040	Cowles Street	No Use	No Use	Alteration (hook ramp only)	Alteration (hook ramp only)	No Use	Alteration	

Exhibit 7-19 — Continued
 Actions Causing Section 4(f) Use of NHLD¹ Resources

		ALTERNATIVES						
		REPLACE AND WIDEN		PRESIDIO PARKWAY				
Number of Element	Name of Element	No-Detour	With Detour	With Diamond Interchange	With Circle Drive	Merchant Road Slip Ramp ²	Preferred	
2042	Crissy Field Avenue	Alteration	Alteration	Alteration	Alteration	No Use	Alteration	
2063	Girard Road	No Use	No Use	Alteration	Alteration	No Use	Alteration	
2064	Gorgas Avenue	No Use	No Use	Alteration	Alteration	No Use	Alteration	
2068	Halleck Street	No Use	No Use	Alteration	Alteration	No Use	Alteration	
2094	Lincoln Boulevard	Alteration	Alteration	Alteration	Alteration	No Use	Alteration	
2185	Vallejo Street	No Use	No Use	Alteration	Alteration	No Use	Alteration	
none	Young Street	No Use	No Use	Alteration	Alteration	No Use	Alteration	
none	Paved/Gravel Area at Low-Viaduct	Alteration	Alteration	Removal	Removal	No Use	Removal	
Cultural Landscape								
none	Cultural Landscape Spatial Relationship	No Use	No Use	Alteration - Actual Use	Alteration - Actual Use	No Use	Alteration - Actual Use	
none	Cultural Landscape Topographic Features	No Use	No Use	Alteration - Actual Use	Alteration - Actual Use	No Use	Alteration - Actual Use	
none	Cultural Landscape Trees/Vegetation	Alteration - Actual Use	Alteration - Actual Use	Alteration - Actual Use	Alteration - Actual Use	Alteration - Actual Use	Alteration - Actual Use	

- Notes:
1. NHLD = National Historic Landmark District
 2. The Merchant Road Slip Ramp Option could be used as an additional design feature with either the Diamond Option or Circle Drive Option. The impacts associated with the Merchant Road slip ramp option would be in addition to the impacts of either the Diamond Option or Circle Drive Option. The Merchant Road Slip Ramp was eliminated under the Preferred Alternative.
 3. The bottom portion of Building 201 would be removed while the top portion would be returned the original building site following completion of the roadway construction.

Alternative 2: Replace and Widen – No-Detour Option

Buildings and Structures

Doyle Drive, a contributing element of the NHLD, would be removed as a result of this alternative which would be an actual use under *Section 4(f)*.

Cultural Landscape

There would be impacts to the cultural landscape of the Presidio NHLD under this alternative due to the: 1) alteration or removal of existing cultural landscape features; and 2) the addition of new non-historic features into the cultural landscape. For a more detailed description refer to Section 3.2.11 of the FEIS/R.

In addition, there would be alteration of the historic vegetation features of the cultural landscape. The construction of the new at-grade roadway, the modification of the Park Presidio Interchange, and the new high-viaduct would result in the alteration of the stands of trees in the areas east and west of the Park Presidio Interchange. South of the new high-viaduct some of the trees in this stand would be removed.

Trees that are located in the area north of Lincoln Boulevard and south of the new at-grade portion of Doyle Drive would be removed. The construction of the new low-viaduct would result in the removal of one palm tree located to the north of the existing low-viaduct structure in the New Commissary and Post Exchange parking lot. Additionally, the construction of the new low-viaduct would result in the removal of one or more of the four Monterey cypress trees located to the west of the Mason Street warehouses.

Because the above-described elements have been deemed, through consultation with the SHPO, to be contributing elements of the NHLD, their alteration would be an actual use under *Section 4(f)*.

Roadways

The Replace and Widen Alternative – No-Detour Option would have a direct impact on the Presidio NHLD by altering the alignment of some contributing roads. Although Veterans Boulevard and Lincoln Boulevard would be modified as described below, they would continue to serve their transportation functions.

Portions of Veterans Boulevard – the Park Presidio Interchange, the two ramps connecting eastbound Doyle Drive to Veterans Boulevard, and the ramp connecting westbound Doyle Drive to southbound Veterans Boulevard – would be altered to accommodate the new, wider roadway. After construction Crissy Field Avenue's alignment at its intersection with Lincoln Boulevard (on its east end) would be permanently moved to the south.

Lincoln Boulevard would be located in the same alignment, however, it would be narrowed from eight meters (26 feet) to 6.6 meters (22 feet); the south edge of Lincoln Boulevard would remain in its existing location and the northern edge of

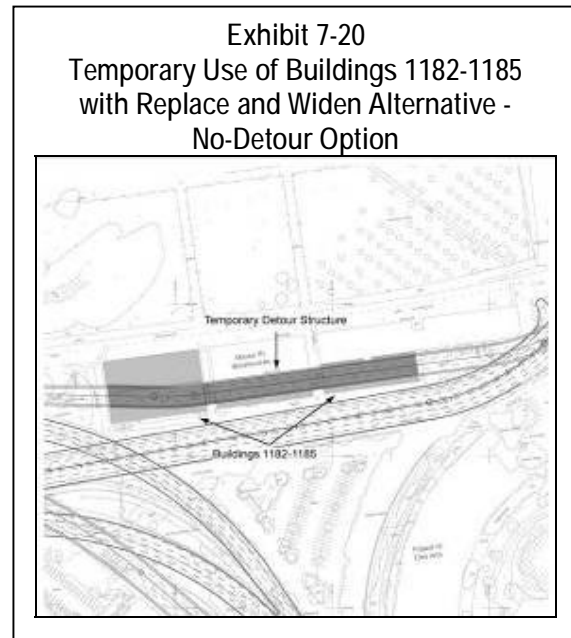
the road would be relocated to the south by 1.4 meters (four feet). Additionally, the sidewalk on the north side of the road would be rebuilt.

Two contributing roadways would be subject to actual use under *Section 4(f)*. Part of unpaved Battery Blaney Road located north of the new at-grade portion of Doyle Drive would be removed. Additionally, Marshall Street would be removed.

Alternative 2: Replace and Widen – With Detour Option

Buildings and Structures

Under this alternative, Doyle Drive would be removed, which would be an actual use under *Section 4(f)*. In addition, this alternative would require the temporary removal of Buildings 1182, 1183, 1184 and 1185 (Mason Street warehouses). The four Mason Street warehouses would be removed to accommodate a temporary detour structure (**Exhibit 7-20**). Following construction, the four buildings would be placed back on their original sites.



Cultural Landscape

Impacts to the cultural landscape would be the same as those described for the No-Detour Option.

Roadways

Impacts to NHLD contributing roadways would be the same as those described for the No-Detour Option.

Alternative 5: Presidio Parkway Alternative - Diamond Option

Buildings and Structures

The Presidio Parkway Alternative would require changes in street grade adjacent to two contributing elements of the Presidio NHLD: Building 228 on Halleck Street and Building 1163 on Gorgas Avenue. The grade of Halleck Street would be raised roughly 0.6 meter (two feet) at the northwest corner of Building 228, rising from the current grade south of the building. The grade of Gorgas Avenue would be lowered roughly two meters (six feet) at the northwest corner of Building 1163. Both these changes in street grades would be accomplished near the buildings, but would not require alteration of the buildings themselves.

This alternative would require the removal of Doyle Drive and NHL D contributing Buildings 201, 204, 230 and 670, which would be an actual use under *Section 4(f)* (see Exhibits 7-21, 7-22, 7-23, and 7-24).

Exhibit 7-21 – Use of Building 201 with Presidio Parkway Alternative

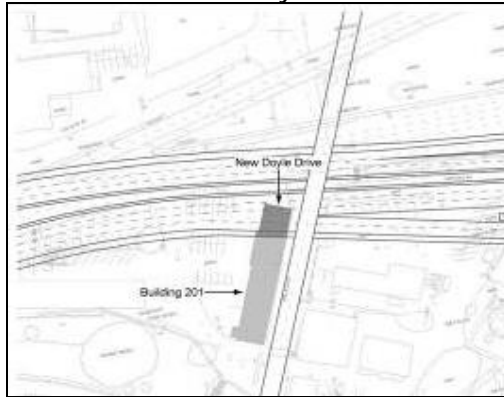


Exhibit 7-22 – Use of Building 204 with Presidio Parkway Alternative

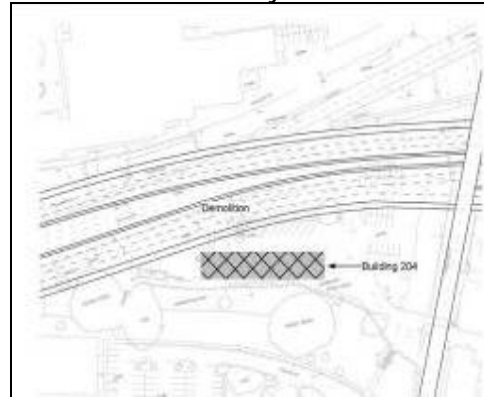


Exhibit 7-23 – Use of Building 230 with Presidio Parkway Alternative

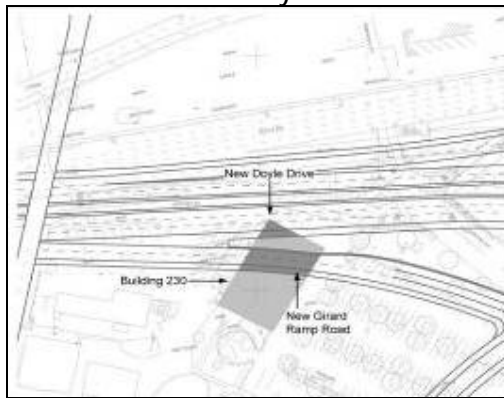
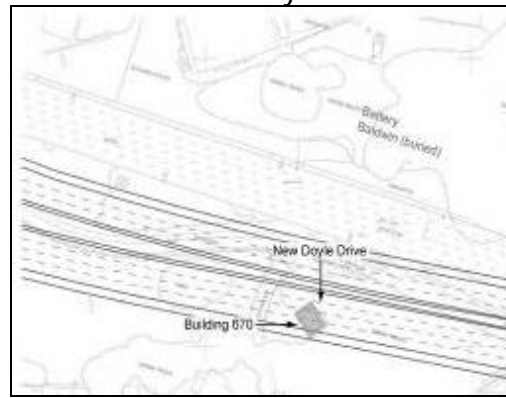


Exhibit 7-24 – Use of Building 670 with Presidio Parkway Alternative



Cultural Landscape

There would be impacts to the cultural landscape resources of the Presidio NHL under Alternative 5: Presidio Parkway Alternative - Diamond Option due to the: 1) alteration or removal of existing cultural landscape features; and 2) the addition of new non-historic features into the cultural landscape. For a more detailed description refer to Section 3.2.11 of this FEIS/R.

The existing grade of the bluff, a historic topographic feature of the Presidio cultural landscape, would be altered. In some portions, an engineered wall would be built.

There would be alteration of the historic vegetation features of the cultural landscape. The construction of the new high-viaduct and reconfiguration of the Park Presidio Interchange would result in the alteration of the stand of trees in the area west of the interchange.

Some of the trees would be removed in the stands that are located: 1) in the area that is north of Doyle Drive and south of Lincoln Boulevard; and 2) in the area that is south of Doyle Drive, west of the Veterans Boulevard viaduct, and northeast of Storey Avenue and Rod Road.

The construction of the new high-viaduct would result in the alteration of the stand of trees in the area east of the Park Presidio Interchange and south of the new high-viaduct. The construction of the new tunnels in the area north of the Main Post would result in the removal of one or more of the three palm trees that are located to the north of the existing low-viaduct structure in the New Commissary and Post Exchange parking lot.

Because the above-described elements have been determined through consultation with the SHPO to be contributing elements of the cultural landscape, their alteration would be an actual use under *Section 4(f)*.

Roadways

The following roadways would be altered but would continue to serve their transportation functions:

- Richardson Avenue would be altered to provide an intersection for access to the Palace of Fine Arts and Gorgas Avenue on the Presidio.
- Battery Blaney Road and Crissy Field Avenue would be realigned at their intersection, and Crissy Field Avenue would be realigned at its intersection with Lincoln Boulevard. Both activities are needed to accommodate construction of the east end of the new high-viaduct structure.
- Girard Road would be widened and extended to the northeast to intersect with Gorgas Avenue and Marina Boulevard.
- The grade of Gorgas Avenue in the vicinity of its new intersection with Girard Road would be lowered by roughly one meter (3.2 feet).
- The grade of Halleck Street would be raised to pass over the eastern portal of the easternmost tunnel proposed by the Presidio Parkway Alternative.

- Lincoln Boulevard would be altered near the cemetery to accommodate the western tunnel structure. These activities would include removal of a portion of the roadway and sidewalks, installation of the tunnel structure, and reconstruction of Lincoln Boulevard over the top of the tunnel structure. The rebuilt road would be in the same alignment and to the same width (eight meters [26 feet]) as the existing road. Additionally, the sidewalk on the north side of the road would be rebuilt. The intersection of Lincoln Boulevard with Crissy Field Avenue would be moved south (west) to avoid the new tunnel portal. Under the Hook Ramp Option of this alternative, Lincoln Boulevard would be also be realigned near Veterans Boulevard (just west of the stables), altering the intersection of Lincoln Boulevard and Cowles Street.
- Crissy Field Avenue between Lincoln Boulevard and Incinerator Road would be realigned south of the original alignment.
- To accommodate the east end of the new high-viaduct structure, unpaved Battery Blaney Road's alignment would be altered where it intersects Crissy Field Avenue.

The following roadway changes would result in the removal of a portion of the contributing roadways an actual use of the cultural landscape:

- Veterans Boulevard would be replaced with new aerial structures at its interchange with Doyle Drive under all options, including the Merchant Road Slip Ramp Option.
- The western portion of Gorgas Avenue, from Marshall to Halleck, would be removed.
- The north portion of Bank Street and three sets of concrete steps would be removed.
- Marshall Street, Vallejo Street and Young Street would be removed.

Alternative 5: Presidio Parkway Alternative-Circle Drive Option

Buildings and Structures

Similar to Alternative 5: Presidio Parkway Alternative - Diamond Option, this alternative would require the removal of Doyle Drive and NHLD contributing Buildings 201, 204, 230 and 670, which would be an actual use under *Section 4(f)* (see **Exhibits 7-21, 7-22, 7-23, and 7-24**). In addition, the removal of Building 1151 (the YMCA pool) would be required, which would be an actual use under *Section 4(f)*. Building 1151 is both a contributor to the NHLD and a recreational resource.

In addition, the Presidio Parkway Alternative – Circle Drive Option would require changes in street grade adjacent to two contributing elements of the Presidio NHLD: Building 228 on Halleck Street and Building 1163 on Gorgas Avenue.

Cultural Landscape

This option would result in the same impacts to the cultural landscape as described for the Diamond Option.

Roadways

This option would result in the same impacts to roadways as described for the Diamond Option.

Preferred Alternative – Refined Presidio Parkway

Buildings and Structures

Similar to Alternative 5: Presidio Parkway Alternative - Diamond Option, this alternative would require the removal of Doyle Drive and NHLD contributing Buildings 201, 204, 230 and 670, which would be an actual use under *Section 4(f)* (see **Exhibits 7-25, 7-26, 7-27, and 7-28**). The top portion of Building 201 would be removed and stored during construction of the project, and then relocated and restored at its original Halleck Street location. Buildings 204, 230 and 670 would be demolished with usable building components salvaged. In addition, the Preferred Alternative would require a change in the grade of Halleck Street which is adjacent the NHLD contributing Building 228.

Cultural Landscape

This option would result in similar impacts to the cultural landscape as described for Alternative 5: Presidio Parkway Alternative - Diamond Option, with the exception of roadway modifications to further minimize impacts as described in Section 7.2.4.

Roadways

This option would result in similar impacts to roadways as described for Alternative 5: Presidio Parkway Alternative - Diamond Option, with the exception of roadway modifications to further minimize impacts as described in Section 7.2.4.

7.5.2 Doyle Drive

All land in the Presidio is property of the federal government. The Presidio Trust administers the interior 80 percent known as Area B, and the National Park Service administers the coastal remainder known as Area A. In addition to Doyle Drive, Caltrans also owns the Highway 1 facility passing through the Presidio which is located along a right of way granted by the United States government. The Presidio Trust would be responsible for granting Caltrans a right of way easement for the expansion of Doyle Drive. The Trust may place certain covenants, restrictions, or conditions on the easement as deemed necessary.

Exhibit 7-25 – Use of Building 201 with Preferred Alternative

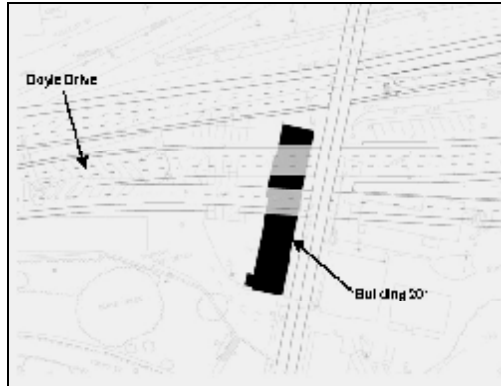


Exhibit 7-26 – Use of Building 204 with Preferred Alternative

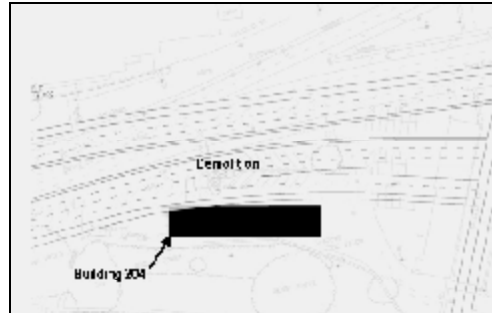


Exhibit 7-27 – Use of Building 230 with Preferred Alternative

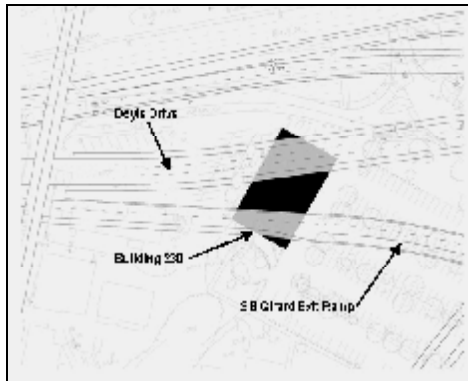
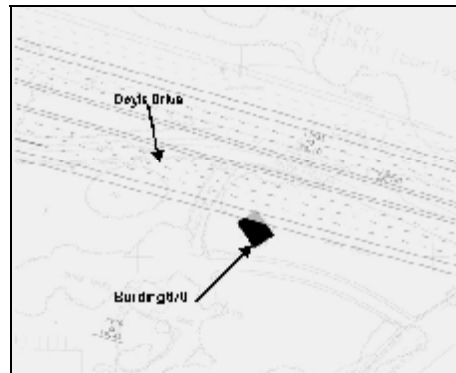


Exhibit 7-28 – Use of Building 670 with Preferred Alternative



All build alternatives would result in the removal of the existing Doyle Drive, including the Marina Viaduct (Bridge 34-0014) and Presidio Viaduct (Bridge 34-0019) and replacement with a new facility. This removal would result in an actual *Section 4(f)* use both due to the removal and changes to character-defining features.

7.5.3 Golden Gate Bridge

All build alternatives would cause a direct impact to the Golden Gate Bridge through the removal of Doyle Drive, which is a contributing element of the Golden Gate Bridge. The recreational features of the property would not have a direct impact under the build alternatives.

A National Historic Landmark nomination was originally prepared by the National Park Service in 1997, but to date, the bridge has not been so designated. Current seismic reinforcement carried out by the Golden Gate Bridge Highway and Transportation District, in addition to the replacement of the contributing Doyle Drive, would have altered this property, necessitating that the contributing elements be redefined for it to be nominated as a NHL. Following completion of construction of the new Doyle Drive, FHWA shall provide the NPS with an updated NHL nomination. For a more detailed description of the effect to historic features of this property, refer to Chapter 3.2.11 of this FEIS/R.

7.5.4 Marina Viaduct

All build alternatives would result in the removal of the existing Marina Viaduct. This property, which is also a contributing element to the NHL and the Golden Gate Bridge property would result in an actual *Section 4(f)* use.

7.5.5 Presidio Viaduct

All build alternatives would result in the removal of the existing Presidio Viaduct. This property, which is also a contributing element to the NHL and the Golden Gate Bridge, would result in an actual *Section 4(f)* use.

7.5.6 Palace of Fine Arts

Alternative 2: Replace and Widen - All Options

This alternative would not use any land from the Palace of Fine Arts.

Alternative 5: Presidio Parkway

Recreational Component

Alternative 5 would reconfigure circulation within the Palace of Fine Arts property by removing existing parking spaces along west Palace Drive, converting Palace Drive into a one-way lane(s) and reconfiguring the south intersection at Lyon and Bay Street to provide access to an underground parking structure west of the Palace of Fine Arts property. Visitor access to the facility would, therefore, be altered.

There would be new pedestrian crossings on Girard Road between the Palace of Fine Arts and Girard Road, as well as a crossing at the Richardson Avenue/Gorgas Avenue intersections (DKS Associates, 2004).

Diamond Option

This option would require an easement for a portion of the Palace of Fine Arts property, located west of Palace Drive near the north end of the Exploratorium building where Girard Road would extend to Marina Boulevard. The Girard Road extension would cover a small triangular area of 0.01 hectares (0.03 acres).

Circle Drive Option

This option would use three small portions of the Palace of Fine Arts property, located west of Palace Drive. The areas are located near the north end of the Exploratorium building where Girard Road would extend to Marina Boulevard, at the location of the proposed traffic circle near the center of the Exploratorium building, and at the southern end of the Exploratorium building where Circle Drive approaches the intersection with Richardson Avenue. These areas combined would cover an area of 0.07 hectares (0.18 acres).

Preferred Alternative - Refined Presidio Parkway

Recreational Component

The Preferred Alternative would maintain Palace Drive as a two-way road and incorporate the modifications proposed by SFDRP at north and south ends where Palace Drive connects to Lyon Street. The Preferred Alternative would also maintain Lyon Street as a two-way street with connection to Bay Street.

To enhance pedestrian safety and accessibility, the Preferred Alternative would provide pedestrian access under Doyle Drive from the Gorgas warehouses to the Palace of Fine Arts and under Girard Road from the Palace of Fine Arts to the Mason Street warehouses.

The Preferred Alternative would maintain the existing parking supply by reconstructing Palace Drive in its existing location to provide perpendicular parking on both sides of a two-way Palace Drive. This is not considered a use of the Palace of Fine Arts property.

Historic Component

There would be no actual use of the contributing features of the historic property (lagoon and landscaping, the rotunda, and the colonnade) which make it eligible for the NRHP. The nomination of the Palace of Fine Arts to the NRHP was accepted by the Keeper of the NRHP and listed in the NRHP in December 2005.

7.6 Avoidance and Minimization

Doyle Drive is the south access to the Golden Gate Bridge. To reach the Golden Gate Bridge, Doyle Drive must pass through the Presidio – there are no alternative routes outside the Presidio that can make this connection. There is no feasible and prudent avoidance alternative to passage through the Presidio per 23 CFR 774.3(a)(1) and 774.17, as no alternative that completely avoids the use of land from the Presidio could meet the purpose and need of the project. Alternatives were considered as part of alternatives development process, as described in Chapter 2 of this document that could minimize impacts to all facilities in the Presidio – as a parkland, including natural resource features and cultural resources. The Preferred Alternative - Refined Presidio Parkway as described in Chapter 2 of this FEIS/R is the alternative with the greatest

opportunity to minimize an array of resource impacts to the Presidio, balancing an array of resource considerations, while meeting the purpose and need for the project (23 CFR 774.3(c)). For example, when compared to the existing facility, the Preferred Alternative is a better complement to the spectacular natural environment the facility resides in and restores scenic views of the Presidio and the San Francisco Bay by eliminating the existing concrete structures.

The relationship of the proposed project to the nearby Palace of Fine Arts and the Exploratorium was also considered and measures to avoid or minimize impacts were an integral part of the alternatives development and selection process.

This section summarizes the alternatives considered in minimizing impacts to the Presidio and the Palace of Fine Arts, having received public and agency input during scoping on a wide array of alternatives – all of which would need to go through the Presidio. All were evaluated to determine if they minimized harm to the *Section 4(f)* resources. After the initial screening, it was determined that the most prudent alternatives would be those that utilized as much of the existing Doyle Drive easement as possible while minimizing impacts on the Presidio. Subsequent to the DEIS/R, a preferred alternative was selected with the greatest opportunity to minimize an array of resource impacts while meeting the purpose and need for the project. For example, the Parkway Alternative no longer includes underground parking at the Palace of Fine Arts. The lead and cooperating agencies have rigorously explored and objectively evaluated all the alternatives considered to date. For more detail refer to Chapter 2 in this FEIS/R.

7.6.1 Alternatives Development Process

Meetings were held with elected officials, planning and engineering staff, and community residents to discuss potential project alternatives and access options. Scoping meetings, open houses, and small community meetings were conducted in early 2000 and continued throughout the process. As a result of these meetings, evaluation criteria based on the goals and objectives for the project were developed to help eliminate alternatives and access options. The criteria were then applied through successive layers of screening.

As a result of the initial screening in October 2000, the original set of 16 alternatives (including the No-Build Alternative) and six access options were reduced to a set of six alternatives that could be paired with two access options. Additional screening for traffic operations in April 2001 resulted in the inclusion of a new alternative. In June 2001, these seven alternatives were renamed and numbered.

Further screening reduced the set of seven alternatives to four alternatives (the No-Build Alternative and three build alternatives) and two access options. Two of the build alternatives were paired with the access options to form four alternatives (for a total of six alternatives).

These six alternatives were analyzed in the environmental preliminary review for the Doyle Drive Project. This preliminary review took place in June 2002.³

The Couplet Alternative was developed during the alternative refinement process to maximize views of the Palace of Fine Arts and the Golden Gate Bridge from the roadway and to enhance pedestrian accessibility by separating east and westbound traffic.

Following review of the six alternatives, an additional alternative was brought forward (Presidio Parkway Alternative) and a feasibility study was conducted.⁴ The Presidio Parkway Alternative provided an alternative closer to the Parkway concept developed as part of the Doyle Drive Task Force (1993). The alternative featured wide lanes and medians to emphasize the park-like setting and used two shallow tunnels to improve access and linkage among Presidio elements across the Doyle Drive corridor. Halleck Street would be raised over the tunnel portal to allow a low level parkway to pass over an area planned for future expansion of the Crissy Marsh.

Access to the Presidio is provided via signalized intersections at an extension of Girard Road to Marina Boulevard. The Parkway Alternative includes several options including two east-end Presidio access options, two Park Presidio Interchange options, and a slip ramp to Merchant Road.

Based on the results of the feasibility study, the project team determined that the additional alternative should be added to the list of existing alternatives. This new alternative was presented to community members and agencies.

Based upon the inclusion of this alternative, in November 2003, the project team recommended elimination of four of the six alternatives which appeared in the preliminary environmental review. This recommendation was accepted by the participating agencies and the public at a meeting in February 2004. As a result, the DEIS/R was based on the evaluation of one No-Build Alternative and two build alternatives – each of which has two access options.

Following release of the DEIS/R in December 2005, individuals and agency staff provided almost 800 comments regarding the environmental analysis and project alternatives. Based on these comments and agency/public workshops, it was determined that Alternative 5: Presidio Parkway, would best meet the purpose and need of this Doyle Drive Project, if certain modifications to the proposed design were made.

In response to these comments, and to address traffic circulation, tidal inundation issues, the elimination of the underground parking below Doyle Drive and the

³ More detail of the six alternatives is provided in the Final Alternatives Report prepared for the Doyle Drive Project San Francisco County Transportation Authority [the Authority] 2000.

⁴ The feasibility study performed by Arup (Doyle Drive SPUR Alternative Feasibility Study) was completed in October 2003.

provision of additional surface parking to more closely match existing conditions, the refinements were made to the Presidio Parkway Alternative as described in Section 7.2.4 of this FEIS/R.

The Doyle Drive Subcommittee to the Citizens' Advisory Committee (CAC), the Doyle Drive Executive Committee comprised of lead, cooperating and responsible agencies and the Authority CAC all held meetings in July 2006 to consider recommendations for a preferred alternative and design options. All three groups made identical recommendations for selection of the Presidio Parkway and design options.

The recommendations were: Alternative 5, Presidio Parkway, with specific design elements including the modified Hook Ramp Option for the Presidio Parkway Interchange and the Diamond Option for Presidio Access.

7.6.2 Alternatives Considered and Withdrawn

Each alternative was developed to better meet the purpose of the Doyle Drive Project and to use as narrow a corridor as possible to minimize impacts to resources within the Presidio. During the NEPA process, options were screened for their ability to:

- satisfy the objectives of the project;
- minimize visual impact;
- minimize the roadway footprint;
- provide pedestrian access;
- maintain traffic safety; and
- improve traffic operations.

Eliminated During Initial Evaluation and Traffic Screening

Using the evaluation criteria, the initial alternatives and access options were evaluated. Based on the findings, the following alternatives and access options were withdrawn from further study:

Retrofit Without Widening (Minimal Improvements)

This alternative was withdrawn from further consideration because minimal improvements would not provide wider travel lanes, a median barrier, or shoulders, and would not meet the project's purpose and need of improving traffic safety.

Transit Exclusive Alternative

This alternative was withdrawn from further consideration because Doyle Drive would no longer serve its current function as part of the local and regional transportation network and would not improve vehicular access to the Presidio; therefore, it would not meet the Doyle Drive project's purpose and need.

Veterans Boulevard (Highway 1) Alternative

This alternative was withdrawn from further consideration because a substantial amount of right of way to provide space for up to seventeen additional lanes would be needed to accommodate improved intersections along Veterans Boulevard, affecting both parkland and residential properties. Additional right of way would also be needed along the Geary Boulevard corridor from commercial and residential properties to accommodate an additional eleven lanes. However, even with the increased number of lanes, the intersections of Veterans Boulevard at both California Street and Geary Boulevard would operate at unacceptable service levels.

Doyle Boulevard Alternative

This alternative was withdrawn from further consideration because the Doyle Boulevard intersections would require at least eight lanes to accommodate the turning volumes and increase the width of the project footprint by 7.2 meters (24 feet) that would affect historic and aesthetic resources in this area. The increase in congestion of Doyle Drive would increase the volume of cut-through traffic on local park roads. The Veterans Boulevard southbound approach to the California Street and Geary intersections would also require three additional approach lanes to accommodate double left turn lanes and an exclusive right turn lane. Additionally, the level of improvements which would be needed on Veterans Boulevard and Geary Boulevard to sufficiently reduce demand on Doyle Drive was considered unreasonable for purposes of NEPA.

Parallel Construction-Elevated

This vertical alignment was eliminated from further consideration because it would require the removal of historic Buildings 105 and 106 of the Montgomery Barracks, both integral and contributing structures to the National Historic Landmark District, and would take a portion of the San Francisco National Military Cemetery. This profile does not provide enough depth to pass under these resources without removal.

Parallel Construction-Depressed

This vertical alignment was eliminated from further consideration because it would not accommodate the restoration of Tennessee Hollow to the more natural state of open hydrological flow included in the *General Management Plan Amendment* and it would limit pedestrian and bicycle access to overpass structures. Pedestrians and bicycles crossing Doyle Drive could only cross at overpasses constructed to “bridge” the depressed roadway or over park extension over the east tunnel.

Detour Construction-Elevated

This vertical alignment was eliminated from further consideration because it would require the removal of historic Buildings 105 and 106 of the Montgomery Barracks, both integral and contributing structures to the National Historic

Landmark District, and would take a portion of the San Francisco National Military Cemetery. This profile does not provide enough depth to pass under these resources without removal.

Detour Construction-Depressed

This vertical alignment was eliminated from further consideration because it would not accommodate the restoration of Tennessee Hollow to the more natural state of open hydrological flow included in the *General Management Plan Amendment* and it would limit pedestrian and bicycle access to overpass structures. Pedestrians and bicycles crossing Doyle Drive could only cross at overpasses constructed to “bridge” the depressed roadway or over park extension over the east tunnel.

Lombard to Lincoln Alternative

This alternative was eliminated from further analysis because it would require the removal of Buildings 4, 5, 34, 38, 102, and 103 on the Main Post, all of which are integral and contributing structures to the National Historic Landmark District. In addition, it would require the taking of large amounts of parkland while destroying the relationship between the historic buildings and historic landscape features. It would also conflict with the development of the Letterman Digital Arts Complex. This alternative would also require a small portion of the National Cemetery, and would result in a dramatic change to the visual setting of the Presidio.

North of Corridor Alternative

This alternative was eliminated from further analysis because it would require the removal of two Laundress Quarter buildings on Crissy Crescent, both of which are integral and contributing structures to the National Historic Landmark District. It would also destroy the relationship between the historic buildings and the landscape features. In addition, this alternative would require a significant portion of the recently completed Crissy Field and wetland restoration area and conflict with possible expansion of Crissy Marsh.

Gorgas Access Alignment Access Option

This design option was withdrawn from further analysis because it would require the removal of historic buildings, warehouses, the historic gymnasium, and indoor pool along Gorgas Avenue, all of which are integral and contributing structures to the National Historic Landmark District. It would also destroy the relationship between the historic buildings and historic streetscape features. This alternative would conflict with the development of the Letterman Digital Arts Center by removing Gorgas Avenue as the primary internal vehicular and bicycle circulation road. Moving Doyle Drive south of the existing historic buildings would also degrade the Historic Landmark District boundary.

No New Presidio Access Option

This option was withdrawn from further analysis because it was not consistent with the project's purpose or the *General Management Plan Amendment* and *Presidio Trust Management Plan's* objectives to improve direct intermodal or vehicular access to the Presidio.

No Marina Access Option

This design option was withdrawn from further analysis because it would result in additional traffic on Richardson Avenue and would hamper traffic operations. Changing traffic patterns would increase intrusion in the residential areas of Cow Hollow, Pacific Heights, and the Marina by increasing local traffic between Marina Boulevard and Richardson Avenue.

Alternatives and Access Options Eliminated after Further Review

Following selection of the initial alternatives and access options, alternatives were renamed and paired with the access options. At this time, a new alternative (Couplet) was also added. This resulted in seven alternatives (including the No-Build). Further analyses then were performed. Based on these studies, the following alternatives (and access options) were eliminated from further study.

Parallel Construction Alternatives

All four parallel construction alternatives were eliminated from further review following additional analyses and evaluations. The alternatives were:

- Tunnel (Alternative 6a, Phased Construction, Tunnel under Halleck – Direct Marina Connector)
- Tunnel (Alternative 6b, Phased Construction, Tunnel under Halleck –Signalized Marina Connector)
- At-Grade (Alternative 7a, Phased Construction, Bridge over Halleck-Direct Marina Connector)
- Depressed (Alternative 7b, Phased Construction, Bridge over Halleck-Signalized Marina Connector).

The alignment requirements of these alternatives unavoidably put them under the northern portion of the National Cemetery. After much iteration, moving the alignment as far north as possible, the Parallel Construction Alternatives could not avoid placement of the tunnel under 149 gravesites. Additional information from the Department of Veterans Affairs (VA) raised concerns about the uncertainty of the depth of the actual graves. There is a minimum depth to structure of 5.5 meters (18 feet) below the existing ground line (from top of tunnel to the existing ground line). The VA records do not clearly show the precise depths of the graves and in some cases, more than two graves were placed on top of each other making the depths of the graves greater than anticipated.

Therefore, it could not be assured that a tunnel would not result in disinterment. In addition, these alternatives would have resulted in adverse impacts to historic buildings 105, 106, 107, 108, 122, and 129 in the Main Post area. The Parallel Construction Alternatives would have required longer construction durations, more complex traffic staging, and higher construction costs versus the detour construction alternatives. As a result, the Parallel Construction Alternatives were eliminated from further consideration.

Couplet Alternative (Alternative 5, Renamed Detour Construction, Tunnel under Halleck)

Because the Couplet Alternative would have additional adverse impacts over the tunnel alternatives to historic buildings on Gorgas Avenue and the National Historic Landmark District boundary, as well as traffic and noise impacts, it was dropped from further consideration.

Other Adjustments to Options and Alternatives

The original alternative "Retrofit with Widening" included two possibilities, either:

- Retrofit (Rehabilitate) and widen the existing structures; or
- Replace and widen the existing structures.

The possibility of rehabilitating and widening the existing high- and low-viaducts was considered and withdrawn for numerous reasons. At the high-viaduct, the geometry of the substructure of the west approach precluded widening and required replacement of the entire west approach. The Sufficiency Rating based on Caltrans' biennial maintenance inspections indicated deterioration has compromised the ability of the gravity load carrying capacity of the structure as well as the lateral load carrying capacity (seismic safety) of the structure. The Retrofit by Rehabilitation and Widen Alternative cannot meet the seismic performance goals of the Corridor given that the structure is designated as an "important route". The poor structural condition of the existing facility precludes rehabilitation; therefore, the structure must be replaced to meet structural safety standards.

At the low-viaduct, the Retrofit by Rehabilitation and Widening Alternative is not a feasible option due to the fact that the existing structure cannot be retrofitted to meet Maximum Credible Earthquake design standards and as a result has been recommended for replacement prior to the year 2008.

The other option for the original alternative, Retrofit by Replace and Widen, was renamed to Replace and Widening, and was carried forward for further evaluation.

Alternatives and Design Options Presented in the Preliminary Environmental Analysis and Withdrawn

Following development of a new alternative (Presidio Parkway), additional evaluations and analyses were performed.

A public meeting was held in February 2004 to inform the public of the decision to drop Alternatives 3a, 3b, 4a, and 4b while adding the Presidio Parkway Alternative. The meeting presented the reasons for the decision and allowed the public an opportunity to talk with members of the project team about various aspects of the project and provide verbal and written comments. The project team also met with various neighborhood and stakeholder groups to present the decision to drop Alternatives 3a, 3b, 4a, and 4b and add the Presidio Parkway Alternative. This change was supported by the public.

As a result, all four detour construction alternatives were eliminated from further review following additional analyses and evaluations. The alternatives were:

- **Alternative 3a:** Detour Construction, Tunnel under Halleck, Direct Marina Access
- **Alternative 3b:** Detour Construction, Tunnel under Halleck and Girard, Signalized Marina Connector
- **Alternative 4a:** Detour Construction, Bridge Over Halleck, Direct Marina Access and
- **Alternative 4b:** Detour Construction, Bridge Over Halleck and Girard, Signalized Marina Connector

All four alternatives would have some impacts to historic buildings within the Presidio, but the impacts as a result of the tunnel alternatives would be more significant. The tunnel alternatives would permanently displace between six and eleven historic buildings, while the Parkway Alternative would displace between four and five historic buildings, and the Replace and Widen Alternative would not permanently displace any historic buildings. In addition, only the Replace and Widen and the Parkway Alternatives would retain the historic Batteries Slaughter and Blaney, offer the greatest distance of the new structures from the cavalry stables area; and maintain (as opposed to lower) the elevation of the viaduct over Stilwell Hall. Neither the Replace and Widen nor the Parkway Alternatives would displace any of the Gorgas warehouses and, as such, take the greatest measures to minimize harm to cultural resources.

Alternatives 3a, 3b, and 4a require groundwater bypass systems to maintain the Tennessee Hollow hydrology due to the construction of tunnels in this area that would sever the natural hydrologic connections.

During construction of the long tunnel alternatives, the traffic capacity of the existing Doyle Drive facility would need to be maintained throughout the construction period, requiring a temporary detour structure. The detour structure would be built north of the existing facility to divert traffic away from

the existing facility during construction. The detour structure, as part of Alternatives 3a, 3b, 4a and 4b, would increase the construction costs, as well as the length of the construction period. The longer construction duration and more complex traffic staging associated with the tunnel alternatives would result in higher costs to construct (\$103 million to \$197 million more), depending on the alternative selected. Construction length would be seven years as compared to four to five years with the Replace and Widen and Parkway Alternatives.

The Operation and Maintenance (O&M) costs were also projected to be greater with the long tunnel alternatives. The tunnel alternatives' annual mechanical and electrical O&M costs would be between \$860,000 to \$1,250,000 due to the additional tunnel maintenance (cleaning, ventilation, lighting, surveillance and fire protection); whereas, the annual mechanical O&M costs for the Replace and Widen Alternative would be approximately \$50,000 if the moveable barrier option were selected, and the Parkway Alternative approximately \$500,000 for tunnel O&M costs due to the shorter tunnel lengths and only one bore needing mechanical ventilation.

Additional Consideration and Analysis: Elimination of Auxiliary lane

The Presidio Parkway Alternative has reduced lane widths (3.3 meters [11 feet] instead of 3.6 meters [12 feet]) and reduced inside shoulders to decrease the mass and scale of the structure. The Presidio Parkway Alternative also has a wide, heavily landscaped median separating the north and southbound roadways.

At the request of the GGNRA and Trust, the design team considered eliminating the auxiliary lane between the Park Presidio Interchange and the new Girard Road Interchange. The inclusion of the Girard Road Interchange is a necessary design feature to meet the objective of providing direct vehicular access to the Presidio from Doyle Drive. The elimination of the auxiliary lane would further reduce total area of pavement primarily to the inside, increasing the width of the median. A reduction in traffic by 11 percent would be needed to eliminate the auxiliary lane (DKS 2005).

The GGNRA also requested evaluation of the elimination of the Veterans Boulevard ramp. The Veterans Boulevard ramp accommodates trips from people south of Golden Gate Park to reach the downtown area by cutting through the Presidio. If the ramp was eliminated, these people would use alternative routes outside the Presidio.

A traffic operations analysis evaluated two options:

1. Reduce all traffic coming on to Doyle Drive by 11 percent by metering traffic at the Golden Gate Bridge Toll Plaza, Merchant Road and Veterans Boulevard on-ramp to Doyle Drive; and,
2. Eliminate the Veterans Boulevard on-ramp.

The results of the analysis of ramp metering (DKS 2005) shows that metering traffic at the merge point would divert traffic to Lincoln Boulevard, disrupting

local Presidio traffic; therefore, the Bridge and all ramps would have to be metered. In addition, if ramp meeting were implemented at the Golden Gate Bridge Toll Plaza, the delay would interfere with bridge operations and unreasonably delay Golden Gate Transit buses.

The analysis of the elimination of the Veterans Boulevard on-ramp (DKS 2005) shows that elimination of the on-ramp would reduce the need for the full auxiliary lane; however, the two-lane off-ramp to Girard Road would still be needed with 400 meters (1,312 feet) of auxiliary lane in advance of the exit. More importantly, traffic that would have used the ramp would travel northward and exit at the Merchant Road off-ramp, and then use local Presidio streets to reach the Merchant Road southbound on-ramp to Doyle Drive; other traffic would shift onto other Richmond District and Presidio streets. The additional traffic that would use the southbound Merchant Road on-ramp would create additional new southbound traffic queuing in the Toll Plaza area, which would need to be addressed.

Alternatives and Access Options Eliminated after Further Review in the DEIS/R

The Doyle Drive Subcommittee to the Citizens' Advisory Committee (CAC), the Doyle Drive Executive Committee comprised of lead, cooperating and responsible agencies and the Authority CAC all held meetings in July 2006 to consider recommendations for a preferred alternative and design options. All three groups made identical recommendations for selection of the Presidio Parkway and design options. The recommendation was Alternative 5, Presidio Parkway, with specific design elements and modifications including the modified Hook Ramp Option for the Presidio Parkway Interchange and the Diamond Option for Presidio Access. Options which were included in Alternative 5 that were eliminated in the Preferred Alternative included:

- **Underground parking.** Due to improved pedestrian and vehicular circulation achieved with surface parking and the avoidance of potential disturbance to the existing groundwater regime and archaeological impacts, reconfigured surface parking was selected over an underground parking facility.
- **Merchant Road Option.** Since the additional impacts were considered too great to justify the improved access to Merchant Road, the Merchant Road Option was eliminated. The construction of the slip ramp would take an additional 0.5 hectares (1.2 acres) of parkland, require the removal of four residential buildings along Armistead Road and increase construction costs by \$28.1 million. The improvements to weekday PM traffic operations could be achieved through the addition of an all-way stop sign at the northern terminus of Merchant Road and weekend congestion reduced through improvements to the Golden Gate Bridge visitors' parking lot.
- **Loop Ramp Option.** Due to the increased impacts to biological resources and intrusion into scenic vistas, the Loop Ramp Option at the Park Presidio Interchange was eliminated. Careful design of the ramp connecting northbound Veterans Boulevard to southbound Doyle Drive minimized any

- impacts to Cavalry Hollow; therefore, the take of an additional 0.6 hectares (1.4 acres) to construct the Loop Ramp Option was not justified.
- Circle Drive Option. Since the development of the Circle Drive Option as presented in the DEIS/R, the SFDRP advanced their plans for the rehabilitation of the Palace of Fine Arts and identified the need to retain Palace Drive as a two way street. Although many configurations were developed, the Circle Drove Option remained incompatible with a two-way Palace Drive. Residents along Lyon Street were also adamant that Lyon Street should remain as a two-way street. In addition, the construction of Circle Drive would require the removal of Building 1151, the historic pool building. Since the refined Diamond Option accommodates a two-way Palace Drive and Lyon Street and retains the pool building, the Circle Drive option was eliminated.

7.7 Analysis of Harm

Under 23 CFR 774.3(c), when there exists no feasible and prudent alternative to the use of Section 4(f) property, FHWA may approve only the alternative that:

1. Causes the least overall harm in light of the statute's preservation purpose. The least overall harm is determined by balancing the following factors as applicable:
 - i) The ability to mitigate adverse impacts of each Section 4(f) property (including any measures that result in benefits to the property);
 - ii) The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
 - iii) The relative significance of each Section 4(f) property;
 - iv) The views of the official(s) with jurisdiction over each Section 4(f) property;
 - v) The degree to which each alternative meets the purpose and need for the project;
 - vi) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
 - vii) Substantial differences in costs among the alternatives.
2. The alternative selected must include all possible planning, as defined in §774.17, to minimize harm to Section 4(f) property.

Implementation of the Preferred Alternative – Refined Presidio Parkway would result in the use of *Section 4(f)* properties such as the removal of Doyle Drive and NHLD contributing Buildings 201, 204, 230, and 670. The Preferred Alternative would require 11.7 hectares (29.0 acres) of right of way which is 2.6 hectares (6.4 acres) more than the existing condition. In addition, there would be impacts to the cultural landscape of the Presidio NHLD. The existing grade of the historic

bluff would be altered as would historic vegetation features of the cultural landscape.

The Preferred Alternative has been identified as such because instead of simply replacing what currently exists (itself a 4(f) use), the project team, including the Presidio Trust as land managers (in keeping with 774.3(c)(1)(iv)) and other participating agencies, worked to design an alternative that would improve conditions within the Presidio from both traffic and aesthetic perspectives, resulting in the least overall harm to *Section 4(f)* resources, as demonstrated below. The Preferred Alternative includes all possible planning to minimize harm (as defined in 23 CFR 774.17). and after balancing all of the different aspects to this project, there is no “feasible and prudent avoidance alternative”, as defined in 23 CFR 774.17.

A full description of the measures to minimize harm to the *Section 4(f)* resources is provided in Chapter 3 and **Appendix K** in this FEIS/R under each specific element of the environment.

Following are other measures that have been developed for the Preferred Alternative to minimize harm:

- design exceptions;
- construction sequencing;
- temporary road closures;
- compensation for lost resources; and
- provisions of the *Section 106 Programmatic Agreement* (PA).

The Preferred Alternative – Refined Presidio Parkway, as described in Chapter 2, has been refined within the Doyle Drive corridor to avoid or reduce potential harm to *Section 4(f)* resources by moving project elements away from resources or using a variety of construction techniques. For example, the distance between the new roadway and the National Cemetery was maximized with non-standard lane and shoulder widths in that area under all alternatives as described below.

The avoidance, minimization, and/or mitigation measures discussion in Chapter 3 focuses primarily on the Preferred Alternative because these measures are being negotiated among the cooperating agencies and finalized in the PA and the associated archaeological and built environment treatment plans being developed for the project. Both the PA and treatment plans focus solely on the Preferred Alternative. The San Francisco County Transportation Authority (the Authority), Caltrans, and FHWA are working closely with the SHPO, the Presidio Trust, the National Park Service, the ACHP and other interested parties to ensure appropriate measures are developed and implemented.

The PA would be completed and executed prior to the *Record of Decision* (ROD). The treatment plans would be completed within three months of the ROD.

7.7.1 Design Exceptions

A series of design exceptions is requested for incorporation into the Preferred Alternative – Refined Presidio Parkway design. The following describes some of the key exceptions which reflect the minimization of impacts while maintaining traffic safety.

- A non-standard section between the National Cemetery and the Batteries would reduce lane-width and shoulder-width to avoid both the National Cemetery and the Batteries.
- In the Gorgas warehouse area, an exception to the design speed stopping sight distance would move the alignment north with a tighter curve to avoid the Gorgas warehouses.
- In the southbound portion of the roadway in the area of Building 106, there is additional construction complexity and staging to build the roadway in two sections to avoid any impacts to Building 106.
- At the Park Presidio Interchange the options would have non-standard design elements to provide adequate separation of the Cavalry Stables buildings from the roadway. The Loop Ramp Option would avoid the stables but would add additional costs. The Hook Ramp Option with the design exceptions would maximize the distance from the stables.

These design exceptions, while achieving other project objectives, would minimize harm to the *Section 4(f)* properties.

7.7.2 Construction Sequencing

The Preferred Alternative – Refined Presidio Parkway would use complex multi-phased construction staging in order to minimize the construction footprint - building the project within the permanent footprint as opposed to expanding beyond the new Corridor boundaries. Construction staging areas also would be limited to minimize the construction footprint.

In addition, the project would avoid construction vibration impacts by using low vibration demolition and construction techniques such as a soil cushion that absorbs vibration during the removal of the low-viaduct and using drilled or oscillated piles instead of driven piles to reduce vibration close to historic buildings.

Every practicable effort would be made to minimize the dust and noise during construction through the use of standard *Best Management Practices* (e.g., watering, covering of soil piles, and street sweeping), and standard accepted noise reduction measures (e.g., maintaining tune of equipment, limited work hours in accordance with local ordinances). Coordination with the Trust regarding location and duration of work in affected park and recreation facilities would be carried out whenever feasible. An effort would be made to keep the public informed of recreation impacts during the construction process.

7.7.3 Temporary Road Closures

Construction activities would require the periodic closure of various roadways including portions of McDowell Avenue, Crissy Field Avenue, Lincoln Boulevard, Gorgas Avenue, Halleck Street, and Marshall Street. For the Preferred Alternative – Refined Presidio Parkway, Halleck Street would be closed for most of the construction period. A *Transportation Management Plan* would address traffic impacts resulting from the construction of the project. Detours would be available and signage would be provided to direct bicyclists and pedestrians to the alternate routes. Bicycle and pedestrian access across from the Doyle Drive corridor would be maintained via Marshall Street, Crook Street, McDowell Avenue/Crissy Field Avenue, at the Lincoln Boulevard/Park Presidio Interchange, and at the Lincoln Boulevard/Golden Gate Bridge Toll Plaza.

7.7.4 Compensation

The Trust, as the land managers, would be compensated as applicable by law for the removal or permanent removal of buildings. This compensation would be determined and implemented as part of the right of way acquisition process.

7.7.5 Section 106 Programmatic Agreement (PA)

The following discussion presents measures to minimize harm for potential impacts to *Section 4(f)* historic properties. The measures taken to mitigate adverse effects of the project are being addressed in a *Programmatic Agreement* (PA) for the project under the auspices of the *Section 106* consultation process. The PA would be developed in coordination with FHWA, the SHPO, the ACHP, the federal cooperating agencies and other interested parties and would be executed in advance of the *Record of Decision* (ROD). The PA calls for a built environment treatment plan and an archaeology treatment plan to be developed to specifically address the effects of the project on NRHP-eligible properties and outlines the measures that would be implemented to mitigate these effects. The treatment plans are being developed concurrently with the PA. The PA would be completed and executed prior to the ROD with the treatment plans to be completed within three months of the ROD.

Archaeological Protection Monitoring, Discovery, Evaluation, and Treatment Plan

An archaeology monitoring, discovery, evaluation and treatment 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-6/26) and to address the potential for discovery of unknown archaeological resources. A professional archaeologist who meets the Secretary of the Interior's *Professional Qualifications Standards* (48 FR 44738-9) would prepare the plan and monitor all pre-construction and construction activities in the project area.

The plan would be consistent with the Secretary of the Interior's *Standards and Guidelines for Archaeological Documentation* (48 FR 44734–37) and take into account

the Council's publication, *Treatment of Archaeological Properties: A Handbook* (ACHP 1980), and SHPO guidelines. Specifically, the plan would specify the process and schedule for conducting evaluations in areas within the APE, including where additional subsurface exploration is to be carried out; the methods, locations, and schedule for subsurface exploration; and the methods that would be used to determine whether archaeological properties are significant. It would also outline the process and schedule for conducting data recovery for significant resources found in the APE, including the research questions to be addressed through data recovery; the methods to be used in analysis, data management, and dissemination of data; and the methods to be used for data recovery, with an explanation of their relevance to the research questions. The plan would outline the procedures that would be followed in the event of an unanticipated archaeological discovery. The plan would also describe proposed curation of recovered materials and records (see Collections Management/Curation below), and the proposed methods for disseminating results of the work. The plan would also outline the process by which interested Native Americans from the Ohlone community would continue to be consulted. The plan would also outline how the project would comply with the *Native American Graves Protection and Repatriation Act* (NAGPRA) if Native American human remains are encountered during the course of the project.

Built Environment Treatment Plan

The *Built Environment Treatment Plan* (BETP) is being developed with input from the responsible agencies as well as interested parties. It would dictate a variety of tasks intended to avoid, minimize, or mitigate for impacts to the built environment. The plan outlines the following requirements:

Develop Architectural Criteria

Caltrans and SFCTA, in consultation with the Trust and NPS, would prepare architectural criteria that would be utilized, where feasible, in the design process for the project. The criteria would identify design elements for the new facility that are reminiscent of historic character-defining features while integrating the roadway into the Presidio NHLD landscape. The results of the process would be incorporated into the BETP and would influence the project design as appropriate.

Conduct Vibration Studies

Prior to the commencement of any construction activity, a structural engineer would be retained who has experience working with historic buildings to assess and evaluate the stability of Building 106 and the Palace of Fine Arts pond because there is a potential for construction vibration to affect these properties. In order to determine the potential for vibration impacts, Caltrans and SFCTA, working with the consulting parties, would use existing vibration analysis to establish the level of additional analysis needed, including number and placement of receptors and their monitoring requirements. Additional studies, including in-situ testing, would be conducted as indicated. The results of these studies would

inform any additional mitigation requirements, such as changes in construction methodology, shoring, and building stabilization.

Recordation

Prior to the commencement of deconstructing Buildings 201, 204, and 230, the demolition of Building 670 and Doyle Drive, excavation within the Presidio historic landscape, as well as any construction within the vicinity of Buildings 106 and 228, recordation documentation of these resources would be conducted in accordance with the *Historic American Building Survey/ Historic American Engineering Record/ Historic American Landscape Survey* (HABS/HAER/HALS). In addition, seven areas of the Presidio NHLD would be subjected to HALS documentation including the Batteries, Bluff, Stable Area, Quartermaster Area, Gorgas Warehouse Compound, streetscapes, and landscapes totaling about 115 acres directly impacted along the Doyle Drive corridor.

The NPS HABS/HAER/HALS program would be consulted with to determine the level and kind of recordation appropriate for each contributing resource. Archival, digital and bound library-quality copies of this documentation would be developed and made available, as appropriate, to the SHPO, Caltrans, the Trust, and NPS/GGNRA Park Archives and Records Center. Other interested parties and repositories would be identified and the documentation would be distributed to them as appropriate.

Recordation/documentation methods in addition to, or other than, HABS/HAER/HALS may also be appropriate and could be proposed as mitigation for the project during the development of the cultural resources treatments plans which would be completed in Fall 2008.

Preparation of Historic Structures Reports and Conditions Assessments

Historic Structure Reports (HSRs) would be prepared for each historic property or contributing building within the Presidio NHLD that would be affected by the project but are not to be demolished. HSRs would be prepared for Buildings 106, 201, 228, 229 and 1167. These buildings are not expected to be adversely affected by the project, but 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.

Thirty-eight buildings and structures that are in close proximity to the construction area, for which no construction impacts are anticipated, would undergo a *Pre-Construction Condition Assessment* as a precautionary measure and to

provide a baseline for a post-construction assessment. The assessment procedures would focus on conditions of exterior elements, character-defining features in particular, and overall structural conditions. Written assessments would be accompanied by digital photo documentation and field drawings. The assessment would also provide information to determine best protection practices during construction for each of the assessed buildings, and result in the preparation of a field document for the architectural monitor to review the efficacy of the protective measures during construction activities in proximity of the buildings.

Stabilization /Monitoring /Security During Construction

Based on information from the *Historic Structure Reports*, before the construction phase of the project, a comprehensive stabilization/monitoring plan would be prepared. This plan would cover all potentially affected contributing elements, including historic structures and cultural landscape elements. This plan would present a detailed methodology for the protection of historic properties, such as buildings, structures, objects, and sites, including cultural landscape elements, within the project area that are in close 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.

It is anticipated approximately 38 buildings would be subject to stabilization, monitoring, protection, and security procedures during the course of the project. Underpinning and/or other stabilization and protective methods would 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 Code of Federal Regulations Part 61*) would approve and monitor underpinning and stabilization activities. These same buildings would also require pre- and post-construction condition assessment reports.

Appropriate steps would also be taken to ensure that buildings would be protected prior to moving, deconstruction, or demolition to accommodate construction. Building 201 would be protected in place until its upper story is temporarily relocated and its lower story is deconstructed. Measures taken for Building 230 would include securing the building after it is vacated and providing security throughout the period of vacancy prior to deconstruction. Buildings 204 and 670 are currently vacant and would likely remain so until Building 204 is deconstructed and 670 is demolished. These provisions would be outlined in the BETP in consultation with the NPS and Trust Federal Preservation Officer (FPO), and would follow recommended standards established in NPS' *Preservation Brief 31: Mothballing Historic Buildings Measures for the Removal and Temporary Preservation of Historic Properties*.

Public interpretive material would be developed commensurate with the significance themes for the resources affected by the project. The *Architectural Treatment Plan* and BETP would present synchronized plans including the types of public and scholarly interpretation that would be implemented. Interpretive products would include the brochures, signage and panels, and other appropriate media for interpretation. The interpretation plans would also outline the locations where such interpretation would be installed or take place and identify any interpretation that might be needed prior to and during construction to educate Park visitors about the cultural resources protection measures being undertaken. These would in part be informed by the findings of fieldwork such as HABS/HAER/HALS recordation and archaeological monitoring. The interpretive objectives for mitigating effects to historic resources would be coordinated with the Presidio Trust's interpretive program and methodologies.

Materials that are developed as a part of mitigation for effects by this project on cultural resources would be digitized and provided to the Presidio Trust collection in electronic form. Materials would be disseminated to appropriate repositories such as the San Francisco Public Library, San Francisco Architectural Heritage, Golden Gate National Recreation Area (GGNRA), Caltrans District 4, Caltrans Transportation Library in Sacramento, and the Golden Gate Bridge Highway and Transportation District.

Relocation

After recordation in accordance with HABS/HAER/HALS documentation, the top half of Building 201 would be deconstructed, moved, and stored to the extent feasible 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 the top floor of Building 201 would follow the approach outlined in *Moving Historic Buildings* (John Obed Curtis, 1979, American Association for State and Local History) and would adhere to the recommendations outlined in the feasibility report prepared for Buildings 201, 204 and 228 (Garavaglia 2007). In addition, Building 201 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 Trust.

Alteration of Buildings

Halleck Street would be raised resulting in adverse affects to the setting of Building 228. For Building 228, the effects of raising Halleck Street adjacent to the building would be minimized by implementing design treatments, detailed in the BETP, for the sidewalk and retaining walls where the building and Halleck Street connect. This treatment would address the impact of having the ground level of Building 228 at a considerably lower elevation than Halleck Street post-construction.

Architectural Resource Protection Measures and Cultural Landscape Monitoring

Protection measures, such as environmentally sensitive area (ESA) fencing, would be used to protect known resources during construction. These measures would be implemented for contributing elements of the Presidio NHL, including buildings and historic landscaping that are in close 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 the BETP would 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 Presidio NHL would be conducted in proximity to the project to support the protection measures for the built environment and the cultural landscape. Monitoring protocols, which would be detailed in the BETP, would include the location, frequency, and duration of monitoring for each resource type. Monitoring procedures would commence with pre-construction condition assessments of buildings and structures adjacent to the construction footprint in order 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 the BETP would be followed in consultation with the Trust FPO, NPS-GGNRA staff, the SHPO, and ACHP.

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 the upper story of Building 201, and rehabilitation and/or restoration of cultural landscape features would be conducted in consultation with the Trust 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 NPS Preservation Brief 36, *Protecting Cultural Landscapes: Planning, Treatment, and Management of Historic Landscapes*.

Only portions of the Presidio's 1,491 acre cultural landscape would be affected by the project. Therefore, only specific areas, or sub-areas, of the larger cultural landscape would be subject to treatment as part of the mitigation measures for the project. The total area of the Doyle Drive construction corridor is approximately 115 acres. Approximately 86 acres is covered with buildings, roads, paved areas and ornamental landscape, lawn, isolated trees and shrubs. The remainder of the construction corridor is covered with vegetation, most of

which has been designated as historic and contributors to the NHL. These areas would be defined in detail in the BETP. Replanting would require coordination with natural resource restoration prescriptions, Caltrans landscape protocols, erosion control engineering, and the Trust's *Vegetation Management Plan*.

To the extent feasible the effects of reconstructing portions of streets contributing to the Presidio NHLD would be minimized. In particular, Halleck Street, which would be raised to accommodate the new Doyle Drive, would be reconstructed to minimize visual effects where adjacent to Building 228. The walkway by the building would be reconstructed at the same elevation as the building in order to minimize the appearance of the building having sunk into the streetscape. Buildings, structures, objects, and sites that are contributors to the Presidio NHLD that were not to be demolished, but are inadvertently damaged, would also be restored in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties: Standards for Preservation, Rehabilitation, Restoration, and Reconstruction* (1995).

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.

Salvage

Buildings 204 and 230, and the lower story of Building 201, would be deconstructed and the materials salvaged in consultation with the Trust FPO and in accordance with the *Presidio Trust Policy for Waste Minimization in Construction and Demolition*. At a minimum, all historic elements identified by the Trust FPO as being desired for preservation and/or reuse would be salvaged. Salvaged materials would include such elements as structural members, siding, windows, hardware, lighting and plumbing fixtures, and all such items that might be used in preserving and repairing other buildings of a similar vintage and construction. Salvaged materials would be transported and transferred to the responsibility of the Trust at a location to be designated by the Trust FPO and the Trust salvage coordinator. Materials that are salvaged would be documented and cataloged as part of the salvage process. Where feasible, historic vegetation would also be salvaged. Excavation for the Doyle Drive Project may also uncover historic hardscape, such as paths and stairways. Material such as brick and cobblestones would also be subject to recordation and salvage. This mitigation would be coordinated with monitoring measures defined in the *Architectural Treatment Plan*.

After Doyle Drive has been recorded in accordance with the appropriate level of documentation as determined by the NPS program of the HAER, all elements identified by the Golden Gate Bridge Highway and Transportation District as being desired for preservation and/or reuse would be salvaged. Because Doyle

Drive would continue to be used by the traveling public, and the light standards, a contributing element of Doyle Drive, continue to deteriorate, they would be replaced on an as needed basis as public health and safety require, prior to the demolition of the facility. Because any removed standards would be considerably deteriorated, they would not be offered to the Golden Gate Bridge Highway and Transportation District, but would be disposed of properly.

Conduct Post-Construction Condition Assessment, and a Re-evaluation of Resources

Following completion of construction of the new Doyle Drive, a post-construction conditions assessment and re-evaluation would be conducted pursuant to NRHP criteria, of specific buildings that were previously identified as contributors to the Presidio NHL and portions of the cultural landscape of the Presidio NHL to assess whether they still retain sufficient historic integrity to convey their significance.

National Historic Landmark Nomination for the Golden Gate Bridge

An NHL nomination was originally prepared by the National Park Service for the Golden Gate Bridge in 1997, but to date, the bridge has not been so designated. Current seismic reinforcement carried out by the Golden Gate Bridge Highway and Transportation District, in addition to the replacement of the contributing Doyle Drive, would have altered this property, necessitating that the contributing elements be redefined for it to be nominated as a NHL. Following completion of construction of the new Doyle Drive, the NHL nomination form would be updated and submitted to the National Park Service.

Collections Management /Curation

The treatment plans would establish a comprehensive collection program which would be implemented as part of the project for materials discovered during excavation, as well as for records created in support of historic preservation efforts. The program would include a complete collections management protocol that would include accessioning and cataloging, curatorial and preservation treatment, and disposition of these materials into a collections management facility designated by the Trust. This program would be developed in consultation with the Trust FPO.

7.8 Coordination/Officials With Jurisdiction

Agency coordination is integral to the Doyle Drive Project to ensure compatibility with plans and policies in addition to balancing the various resources interests such as cultural, biological and visual. More than 100 interagency coordination meetings have been held thus far.

The two primary agencies having jurisdiction over the Presidio are the Presidio Trust, which is the land manager responsible for long range planning in Area B (within which most of the proposed Doyle Drive project occurs) and the

National Park Service (NPS), which is responsible for the management of Area A. These agencies have been integrally involved in project coordination since beginning of project planning in Spring 2000 and are also NEPA cooperating agencies for this environmental process.

In addition, input has been solicited from historical preservation interest groups, such as the California Preservation Foundation and the Fort Point and Presidio Historical Association throughout project development. Consultation with the SHPO regarding this project has been ongoing since the Doyle Drive Project began. The SHPO has participated in agency meetings to discuss and set the APE, as well as to advise on historic preservation issues.

Coordination also has taken place with the Department of Veterans Affairs (VA), which had concerns about potential impacts to the San Francisco National Cemetery. Following extensive written communication with VA, a meeting was held with this group on January 9, 2002. At the meeting, the Authority reaffirmed that the alternatives requiring tunneling under the National Cemetery had been dropped from further consideration because of the increased risk of disturbance to existing gravesites. The Authority also committed to avoiding the use of any Cemetery property by narrowing the alignment in this area and requesting a design exception as described in Section 6.1. The VA expressed no objections to the remaining alternatives under study, confirmed that they wanted to be informed of the project's progress, and that they would participate on an as-needed basis as cemetery issues were identified.

Because coordination for both parkland and historic resources involved many agencies in addition the Trust and NPS, an Executive Committee was formed to serve as a central body for communication on project issues. The Executive Committee consists of representatives from the lead and cooperating agencies participating in the Doyle Drive Project. In addition to NPS and the Presidio Trust, the Executive Committee consists of other agencies with interests in the Corridor including San Francisco Park and Recreation Department (which has jurisdiction over the Palace of Fine Arts) and the Golden Gate Bridge, Highway and Transportation District (GGBHTD) (which has jurisdiction over the Golden Gate Bridge).

The role of the Executive Committee is to meet on a regularly scheduled basis to address design, environmental analysis, and other technical issues in order to make time-sensitive policy decisions that would lead the overall project team, project staff and consultants. The Committee members serve as a key liaison between the project staff and their respective organizations, and as a consensus body to address and resolve any project issues or concerns. Input and decisions from the Executive Committee are forwarded to the Authority, FHWA, and California Department of Transportation (Caltrans). Input obtained from the public at large has been available and provided to committee members as deemed necessary throughout the project.

A Doyle Drive Subcommittee of the Authority's Citizens Advisory Committee (CAC) has also been formed. The goal of the Subcommittee has been to obtain citizen input and feedback at key milestones throughout the study process. The Subcommittee has also worked with the project team to identify the benefits and disadvantages of various alternatives and issues with regard to the Doyle Drive project.

Following release of the DEIS/R in December 2005, individuals and agency staff provided almost 800 comments regarding the environmental analysis and project alternatives. Based on these comments and agency/public workshops, it was determined that Alternative 5: Presidio Parkway, would best meet the purpose and need of this Doyle Drive project, if certain modifications to the proposed design were made.

In response to these comments, and to address traffic circulation, tidal inundation issues, the elimination of the underground parking below Doyle Drive and the provision of additional surface parking to more closely match existing conditions; refinements were made to the Presidio Parkway Alternative. The Doyle Drive Subcommittee to the Citizens' Advisory Committee (CAC), the Executive Committee and the Authority's CAC all held meetings in July 2006 to consider recommendations for a preferred alternative and design options. All three groups made identical recommendations for selection of the Presidio Parkway and design options.

The recommendations were: Alternative 5, Presidio Parkway, with specific design elements including the modified Hook Ramp Option for the Presidio Parkway Interchange and the Diamond Option for Presidio Access. The groups did not support including the Merchant Road Slip Ramp Option.

Chapter 6 briefly describes the public outreach and agency coordination activities undertaken prior to issuance of the *South Access to the Golden Gate Bridge – Doyle Drive Draft Environmental Impact Statement/Report* (DEIS/R) in December 2005. The chapter also presents public and agency involvement activities since the release of the DEIS/R.

7.9 Section 4(f) Finding

Doyle Drive is the south access to the Golden Gate Bridge. To reach the Golden Gate Bridge, Doyle Drive must pass through the Presidio – there are no alternative routes outside the Presidio that can make this connection and fulfill the purpose and need for this project.

The Preferred Alternative - Refined Presidio Parkway as described in Chapter 2 of this FEIS/R is the alternative that minimizes impacts to the Presidio by providing a design that balances recreational elements with historic resources within this National Park and National Historic Landmark District (NHLDD). In addition, this alternative also addresses an array of other environmental resource considerations, while meeting the purpose and need for the project. The

replacement of Doyle Drive under the Preferred Alternative is consistent with the planning documents of both Presidio controlling agencies, the Presidio Trust and the NPS. Specifically, the new Doyle Drive would fulfill the parkway concept put forth in the *Final General Management Plan Amendment* (GMPA) and would meet the overall replacement and access needs presented in the *Presidio Trust Management Plan* (PTMP). Measures have been incorporated into the project to minimize harm to the *Section 4(f)* properties, including those agreed to in the *Programmatic Agreement* (PA).

7.9.1 Section 4(f) Determination

It is determined that there is no feasible and prudent alternative to the use of *Section 4(f)* properties required for the Preferred Alternative – Refined Presidio Parkway and that implementation of the Preferred Alternative includes all possible planning to minimize harm resulting from such use as these terms are defined in 23 CFR 774.17. These properties include:

- The Presidio NHLD;
- Doyle Drive;
- The Golden Gate Bridge;
- Marina Viaduct; and
- The Presidio Viaduct.

Additional information on the development of the Preferred Alternative and the measures that were taken to minimize harm to *Section 4(f)* resources is explained in Section 7.2.4. The following discussion presents the findings for this determination for each of the above listed properties.

Presidio National Historic Landmark District

The Doyle Drive Project's build alternatives would require additional right-of-way interest⁵ within the Presidio NHLD to construct, operate and maintain the facility. The Preferred Alternative – Refined Presidio Parkway would require 11.7 hectares (29.0 acres) of right-of-way which is 2.6 hectares (6.4 acres) more than the existing condition.

The Preferred Alternative would require the removal of Doyle Drive and NHLD contributing Buildings 201, 204, 230 and 670, which would be an actual use under *Section 4(f)*. The top portion of Building 201 would be removed and stored during construction of the project, and then restored at its original Halleck Street location. Buildings 204, 230 and 670 would be demolished with usable building components salvaged. In addition, the Preferred Alternative would require a change in the grade of Halleck Street which is adjacent the NHLD contributing

⁵ *Doyle Drive is owned and maintained by Caltrans on a grant of right of way by permit from the Federal Government. Caltrans would need to obtain an additional right of way interest from the Trust to construct any of the "build" alternatives.*

Building 228. A *Programmatic Agreement* (PA) incorporates the final decision as to the treatment of these buildings.

There would be impacts to the cultural landscape resources of the Presidio NHLD under the Preferred Alternative. The existing grade of the bluff, a historic topographic feature of the Presidio cultural landscape, would be altered. There also would be alteration of the historic vegetation features of the cultural landscape.

The following roadway changes would result in the removal of a portion of the contributing roadways:

- Veterans Boulevard would be replaced with new aerial structures at its interchange with Doyle Drive under all options, including the Merchant Road Slip Ramp Option.
- The western portion of Gorgas Avenue, from Marshall Street to Halleck Street, would be removed.
- The north portion of Bank Street and three sets of concrete steps would be removed.
- Marshall Street, Vallejo Street and Young Street would be removed.

Doyle Drive

The Preferred Alternative would result in the removal of the existing Doyle Drive, including the Marina Viaduct (Bridge 34 0014) and Presidio Viaduct (Bridge 34 0019) and replacement with a new facility.

The Golden Gate Bridge

The Preferred Alternative would cause a direct impact to the Golden Gate Bridge through the removal of Doyle Drive, which is a contributing element of the Golden Gate Bridge. The recreational features of the property would not have a direct impact under the build alternatives.

Marina Viaduct

The Preferred Alternatives would result in the removal of the existing Marina Viaduct. This property is also a contributing element to the NHLD and the Golden Gate Bridge.

Presidio Viaduct

The Preferred Alternative would result in the removal of the existing Presidio Viaduct. This property is also a contributing element to the NHLD and the Golden Gate Bridge.

7.9.2 Refinement of Build Alternatives

In December 2005, the public review process began with the distribution of the DEIS/R and Draft *Section 4(f)* to the general public and stakeholders, including

officials having jurisdiction over the *Section 4(f)* resource. The review by the public and agencies resulted in over 800 comments, with more than 300 of the comments focused on the project alternatives. The comments expressed overwhelming support for Presidio Parkway Alternative but also expressed concerns for the traffic operations and impact to cultural resources.

In response to the comments, additional traffic operational analysis was performed and the Parkway Alternative was refined to reduce impacts to the cultural resources. The relationship of the proposed project to the Palace of Fine Arts was considered as part of the refinement process and the Parkway Alternative was further refined to avoid a use of the Palace of Fine Arts. The refinements to the Presidio Parkway Alternative to reduce impacts to recreational, cultural and biological resources are more fully described in Section 7.2.4 of this FEIS/R.

7.9.3 Selection of the Preferred Alternative

Following refinement of the Presidio Parkway Alternative, the project team and agencies performed a thorough evaluation of the build alternatives in relation to the project's purpose and need, and their ability to meet the objectives identified by the project team, including officials with jurisdiction over the *Section 4(f)* properties.

As part of the evaluation process, the project specific objectives, as described in Section 7.2 of this FEIS/R, were broken down into 18 evaluation criteria to assist in the more detailed screening and selection process. The criteria were selected to evaluate how well each of the alternatives satisfied the project purpose and other factors. The evaluation criteria listed below relate to the preservation of the natural, cultural and recreational resources in the project area.

- Improve the seismic, structural and traffic safety;
- Maintain the transportation network and improve the approach to the Golden Gate Bridge;
- Preserve the natural, cultural, scenic and recreational values;
- Consistent with land use plans;
- Minimize the effects of noise and air quality on the natural and recreational areas;
- Improve intermodal and vehicular access to the Presidio; and
- Redesign the corridor as a parkway.

The alternatives were evaluated as to how well they satisfied the various criteria. Interested parties and key stakeholders developed recommendations for a preferred alternative during a workshop in July 2006. These recommendations for a preferred alternative were presented to the decision makers for a formal determination. In addition, the Authority received letters of strong support to identify the Presidio Parkway Alternative as the Preferred Alternative from the

Presidio Trust (March 31, 2006) and the National Park Service (NPS) Golden Gate National Recreation Area (March 31, 2006) (see Appendix L; 23 CFR 774.3(c)(1)(iv)).

The evaluation process clearly demonstrated that the Refined Presidio Parkway Alternative had the smallest net impact when the balance of benefits and impacts was considered – it had the best ability to meet the project purpose (23 CFR 774.3(c)(1)(v)).

7.9.4 Results of Alternatives Evaluation

Of the 18 evaluation criteria, the Replace and Widen Alternative (Alternative 2):

- satisfied only five evaluation criteria;
- was neutral on seven criteria; and
- failed to satisfy six criteria.

The Replace and Widen Alternative satisfied the safety (standard lanes, full shoulders, and center median), traffic maintenance and preservation of cultural resources (see Exhibit 7-19) criteria and was neutral on consistency with land use and minimizing air and water quality impacts. The Replace and Widen Alternative failed to satisfy the evaluation criteria related to the preservation of scenic and recreational values, minimizing noise impacts, improving access to the park (no direct Presidio access), and replacing the facility using the parkway concept.

The Refined Presidio Parkway Alternative fully met the purpose of the project. The evaluation process also determined that the Refined Presidio Parkway Alternative:

- satisfied 12 of the 18 evaluation criteria; and
- was neutral on the balance of the evaluation criteria.

When compared with the Replace and Widen Alternative, the Presidio Parkway and Refined Presidio Parkway Alternatives satisfied the safety and traffic maintenance criteria (although they include slightly narrower lanes and shoulders to help reduce the facility width) and was neutral on consistency with land use, minimizing air quality and preservation of cultural resources. However, the seven additional criteria satisfied by the Refined Presidio Parkway Alternative provided a greater benefit to the recreational values of the Presidio. These criteria included the ability of the alternative to:

- preserve scenic values (23 CFR 774.3(c)(1)(vi));
- preserve recreation values (23 CFR 774.3(c)(1)(ii));
- minimize effects of noise and air quality on natural and recreational areas (23 CFR 774.3(c)(1)(i),(ii),(v));

- minimize the effects of water quality on natural and recreational areas (23 CFR 774.3(c)(1)(i),(ii),(v));
- minimize the traffic impacts on local roadways;
- improve intermodal and vehicular access to the Presidio; and
- redesign the corridor using the parkway concept.

While there are fewer impacts to the *Section 4(f)* resources associated with the Replace and Widen Alternative, after extensive consultation with the Presidio Trust, NPS and public, it was determined that the Refined Presidio Parkway Alternative provides an overall greater benefit to the Presidio. The Refined Presidio Parkway Alternative provides several enhancements to the Park, while minimizing take of *Section 4(f)* resources to the greatest extent possible (23 CFR 774.3(c)(1)(i)).

Preferred Alternative: Benefits to the Presidio (23 CFR 774.3(c)(1)(i))

Based on the above evaluation, project stakeholders (including officials with jurisdiction over the *Section 4(f)* properties) identified the Refined Presidio Parkway Alternative as the Preferred Alternative.

The minimal amount of use of *Section 4(f)* resources has resulted from the preliminary design of the Preferred Alternative, especially in light of coordination with the public, the Presidio Trust and NPS. Some of the design features incorporated in the Preferred Alternative include:

- Recreating the bluff north of the Main Post tunnels in order to retain the cultural relationship between the upper and lower portions of the Presidio.
- Modifying the Girard Road off-ramp to preserve the streetscape in front of the warehouses.
- Adjusting the alignment to preserve the historic streetscape of Halleck Street.

The Preferred Alternative minimizes noise by using tunnels adjacent to sensitive areas such as the National Cemetery and Crissy Marsh. Landscaped berms between the tunnels reduce the noise and visual intrusion at Crissy Field.

Although the new facility would be wider than the existing roadway, on balance, there would be no increase in impervious surface. This is due to the presence of the tunnel segments and other design features. Unlike existing conditions, all runoff would be treated prior to discharge to the Bay, which helps protect the water quality and maintains the recreational value of the waterfront area for water-based recreational activities.

The access to be provided at Girard Road would provide direct and enhanced access for park users to enter the Park from both San Francisco and the Golden Gate Bridge. The improved transit facilities on Richardson Avenue would provide improved transit access for park users to enter the Park by consolidating transit facilities in a primary location and connecting to the Presidio shuttle

service. Improved signage along the roadway would further facilitate the access to the Park.

The parkway concept of the Preferred Alternative was intended to replace Doyle Drive within the context and setting as a unit of the National Park system. As such, the design of the Preferred Alternative follows the natural contours of the land, includes tunnel segments, landscaped medians, and is sensitive to Park resources such as the Crissy Field Center, Crissy Marsh and Tennessee Hollow riparian corridor. For the visitors to the Park, the Preferred Alternative would be physically less intrusive than the other alternatives and with the use of tunnels, would enhance the views for users of the Park while providing new connections to Battery Blaney, Main Post and Crissy Field. By minimizing impacts to the recreational resources within the Park and enhancing visual and physical connections in certain area, the Preferred Alternative would preserve and enhance those resources for the enjoyment of all park users.

CHAPTER EIGHT DISTRIBUTION LIST

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CHAPTER TEN

LIST OF PREPARERS

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Amy Lamson Environmental Protection Specialist	MPA, Master of Public Affairs; MSES, Master of Science in Environmental Science; 3 years experience in environmental analysis of highway projects.

San Francisco County Transportation Authority

Leroy L. Saage, PE Project Manager	B.S. Civil Engineering; 28 years experience in planning, design, and construction of transportation infrastructure.
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Caltrans

Nidal Tuqan Regional Project Manager	B.S. Civil Engineering; Master in Project Management; 21 years experience in project management, design, structure, construction and soil engineering.
Jared Goldfine, AICP Senior Environmental Planner	B.A. Economics; Certificate in Land Use Planning; 20 years experience in environmental planning.
Howell Chan Senior Environmental Planner	M.S. Environmental Management; 22 years experience in environmental planning.

Joseph Mihelarakis Associate Environmental Planner	B.S. Civil and Environmental Engineering; 15 years experience in environmental and urban planning.
Dragomir Bogdanic, Transportation Engineer (Water Quality)	M.S. Environmental Engineering; B.S. in Civil Engineering; 11 years experience in water quality management.
Ray Boyer Senior Transportation Engineer (Hazardous Wastes)	B.S. Civil Engineering; 16 years experience in transportation engineering.
Chris Corwin Environmental Engineer	B.A. Mathematics; 21 years experience in environmental engineering.
Richard Vonarb Associate Environmental Planner-Natural Sciences	B.S. Natural Sciences; 16 years experience in natural sciences.
Evelyn Gestuvo Civil Engineer	B.S. Civil Engineering; 16 years experience in civil engineering.
Thomas Packard Landscape Architect	B.A. Landscape Architecture; 18 years experience in landscape architecture.
Elizabeth Krase District Branch Chief, Architectural History	M.A. American and New England Studies; 19 years experience in architectural history.
Lissa McKee Senior Environmental Planner, Cultural Resources	M.A. History; 21 years experience in cultural resources.
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PB Americas, Inc.

Sissel Berntsen-Heber, PE Senior Civil Engineer Engineering Manager, Doyle Drive Design and Environmental Study	B.S. Civil Engineering, MBA; 15 years experience in civil engineering. <ul style="list-style-type: none"> ▪ <i>Preliminary Traffic Management Plan</i>
Kwong Chang, PE Civil Engineer	B.S. and M.S. Civil Engineering; 11 years experience in civil engineering. <ul style="list-style-type: none"> ▪ <i>Storm Water Data Report</i>

Helise Cohn, AICP Lead Transportation Planner	B.S. Mathematics; 16 years experience in transportation planning. <ul style="list-style-type: none"> ▪ <i>Parking Impact Study</i> ▪ <i>Community Impact Assessment</i> ▪ <i>Draft Environmental Impact Statement/Report (DEIS/R)</i>
Theresa Dau, AICP Senior Transportation Planner	Master of City Planning, M.S. Civil Engineering; B.S. City and Regional Planning; 10 years experience in environmental/transportation planning. <ul style="list-style-type: none"> ▪ <i>Community Impact Assessment</i> ▪ <i>Parking Impact Study</i>
Ivy Edmonds-Hess Lead Environmental Planner	B.S. Meteorology; 17 years experience in environmental planning. <ul style="list-style-type: none"> ▪ <i>Draft Environmental Impact Statement/Report (DEIS/R)</i>
Mitchell Fong, PE, GE Lead Geotechnical Engineer	M.S. Civil Engineering (Geotechnical); B.S. (Hons.) Mining Engineering; 18 years experience in geotechnical engineering. <ul style="list-style-type: none"> ▪ <i>Preliminary Geotechnical Report</i>
Matthew Fowler, PE Senior Supervising Engineer	M.S. Civil Engineering (Geotechnical); B.S. Mining Engineering; 22 years experience in geotechnical engineering. <ul style="list-style-type: none"> ▪ <i>Preliminary Geotechnical Report</i>
Elizabeth Fowler Senior Environmental Planner	M.A. Urban Planning; B.A. English; 6 years experience in environmental and transportation planning. <ul style="list-style-type: none"> ▪ <i>Community Impact Assessment</i> ▪ <i>Draft Environmental Impact Statement/Report (DEIS/R)</i>
Mark Grodzki, PE Lead Engineer	B.S. Civil Engineering; 14 years experience in civil engineering. <ul style="list-style-type: none"> ▪ <i>Draft Preliminary Tunnel Systems Report</i>

<p>Gary Kennerley, PE Project Manager, Doyle Drive Design and Environmental Study</p>	<p>B. Eng. Civil Engineering; 20 years experience in civil engineering.</p> <ul style="list-style-type: none"> ▪ <i>Preliminary Engineering</i> ▪ <i>Draft Environmental Impact Statement/Report (DEIS/R)</i>
<p>Susan Killen, AICP Principal Professional Associate Environmental Manager, Doyle Drive Design and Environmental Study</p>	<p>M.Ed. Education; B.A. Art/Education; 27 years experience in environmental planning and the preparation of Major Investment Studies.</p> <ul style="list-style-type: none"> ▪ <i>Section 4(f) Analysis</i> ▪ <i>Draft Environmental Impact Statement/Report (DEIS/R)</i>
<p>John Komaru, PE Senior Supervising Transportation Engineer Transportation Manager, Doyle Drive Design and Environmental Study</p>	<p>M.S. Civil Engineering; Master of City Planning; B.S. Geography; 15 years experience in transportation engineering and planning.</p> <ul style="list-style-type: none"> ▪ <i>Parking Impact Study</i> ▪ <i>Draft Environmental Impact Statement/Report (DEIS/R)</i>
<p>Eric Lilly, EIT Engineer II</p>	<p>B.S. Civil Engineering; 2 years experience in civil/highway design.</p> <ul style="list-style-type: none"> ▪ <i>Environmental Impact Statement/Report(DEIS/R)</i>
<p>Robert Malone, AICP Senior Environmental Planner</p>	<p>Master of Regional Planning; B.S. Management; 10 years experience in environmental/transportation planning and geographic information system (GIS) applications.</p> <ul style="list-style-type: none"> ▪ <i>Community Impact Assessment</i> ▪ <i>Draft Environmental Impact Statement/Report(DEIS/R)</i>
<p>Joanne Ng, EIT Traffic Engineer Transportation Planner</p>	<p>M.A.Sc and B.A.Sc in Civil Engineering; 5 years experience in traffic engineering and transportation planning.</p> <ul style="list-style-type: none"> ▪ <i>Parking Impact Analysis</i>

Shadde Rosenblum, AICP Transportation Planner	Master of Urban and Regional Planning; B.A. International Studies; 8 years experience in environmental/ transportation planning. <ul style="list-style-type: none"> ▪ <i>Energy Analysis</i> ▪ <i>Draft Environmental Impact Statement/Report (DEIS/R)</i>
Dominic Spaethling Lead Planner	Master of City Planning; B.A. International Relations; 14 years experience in environmental/ transportation planning and real estate analysis. <ul style="list-style-type: none"> ▪ <i>Community Impact Assessment</i> ▪ <i>Draft Environmental Impact Statement/Report (DEIS/R)</i>
Lawrence Spurgeon Supervising Environmental Engineer	M.S. Environmental Engineering; B.S. Industrial Engineering; 13 years experience in acoustics and air quality. <ul style="list-style-type: none"> ▪ <i>Technical Review of Air Quality, Noise and Vibration, and Section 4(f) analysis.</i>

ARUP

Ignacio Barandiaran, PE Civil Engineer – Bridge Structures	M.S. Structures and M. Arch.; 12 years experience in structural design and construction. <ul style="list-style-type: none"> ▪ <i>Preliminary Engineering - Structures</i>
John Karn, PE Civil Engineer – Highways	B.S. Civil Engineering; 13 years experience in highway design and construction management. <ul style="list-style-type: none"> ▪ <i>Preliminary Engineering - Highways</i>
Eugene Lam, PE Civil Engineer – Highways	B.S. Civil Engineering; 7 years experience in highway design and civil engineering. <ul style="list-style-type: none"> ▪ <i>Preliminary Engineering - Highways</i>

Albion Consulting

Clinton Blount Anthropologist	M.A. Anthropology; B.A. Anthropology; 29 years experience in Native American consultation and ethnography. <ul style="list-style-type: none"> ▪ <i>Native American Issues Coordination Process</i>
Mark Giambastiani Archaeologist	C. Phil. Anthropology; 13 years experience in archaeological evaluations. <ul style="list-style-type: none"> ▪ <i>Prehistoric Archaeology</i>
Albion-Matthew Brickley Anthropologist	M.A. Anthropology; B.A. Anthropology; 4 years experience in Native American coordination and ethnography. <ul style="list-style-type: none"> ▪ <i>Native American Issues Coordination Process</i>

Baseline Environmental Consulting

Bruce Abelli-Amen, P.G., C.Hg. Certified Hydrogeologist Senior Hydrogeologist	M.S. Environmental Systems, Applied Geology; B.S. Geological Sciences; 18 years experience in geological and hydrological assessment. <ul style="list-style-type: none"> ▪ <i>Hydrology and Water Resources Technical Report</i>
Todd A. Taylor, REA Environmental Associate	B.A. English; 14 years experience in environmental planning. <ul style="list-style-type: none"> ▪ <i>Preliminary Site Investigation</i>

Chaudhary & Associates

Edward A. Krumrei, PE Project Manager	B.S. Civil Engineering; 36 years experience in civil engineering and land surveying with emphasis on transportation and site development projects.
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CirclePoint

Molly Graham Public Outreach Project Manager	B.A. Political Science; 11 years experience in community outreach and public involvement. <ul style="list-style-type: none"> ▪ <i>Public Involvement Process</i>
Jane Kruse Public Outreach Project Associate	B.A. Art History; 5 years experience in community outreach and public involvement. <ul style="list-style-type: none"> ▪ <i>Public Involvement Process</i>
Scott Steinwert Principal Environmental Planner	B.A. Biology; 17 years experience in community and environmental planning. <ul style="list-style-type: none"> ▪ <i>Visual Impact Assessment</i>
Kay Wilson Principal	M.A. Community and Regional Planning; B.A. Political Science; 31 years experience in public affairs and environmental planning. <ul style="list-style-type: none"> ▪ <i>Public Involvement Process</i>

DKS Associates

Dustin Luther, EIT Senior Transportation Engineer	B.S. Civil and Environmental Engineering; B.A. Environmental Studies; 6 years experience in traffic engineering and transportation planning and forecasting. <ul style="list-style-type: none"> ▪ <i>Traffic and Transit Operations Report</i>
Brian Macias, EIT Senior Associate Transportation Engineer	B.S. Civil Engineering; 6 years experience in traffic engineering and transportation planning. <ul style="list-style-type: none"> ▪ <i>Traffic and Transit Operations Report</i>
Elizabeth Rush Senior Transportation Planner	Master of Urban and Regional Planning; B.S. Applied Economic Geography; 11 years experience in transportation planning and forecasting. <ul style="list-style-type: none"> ▪ <i>Traffic and Transit Operations Report</i>
Terry Klim, PE Senior Transportation Engineer	M.S. Transportation Engineering; B.A. Civil Engineering; 18 years experience in traffic engineering. <ul style="list-style-type: none"> ▪ <i>Traffic and Transit Operations Report</i>

Ming Lee, EIT, Ph.D. Senior Transportation Engineer	Ph.D. Civil Engineering; M.S. Civil Engineering; B.S. Agricultural Engineering; 9 years experience in traffic engineering and forecasting. <ul style="list-style-type: none"> ▪ <i>Traffic and Transit Operations Report</i>
Deborah Dagang, PE Principal	M.S. Civil Engineering; B.S. Civil Engineering; 19 years experience in traffic engineering and transportation planning. <ul style="list-style-type: none"> ▪ <i>Traffic and Transit Operations Report</i>
Joseph Story, AICP Principal	Master of City and Regional Planning; B.S. Urban Affairs; 24 years experience in transportation planning and forecasting. <ul style="list-style-type: none"> ▪ <i>Traffic and Transit Operations Report</i>

Environmental Science Associates

Gary Oates Principal	M.A. Biology; B.S. Zoology; 24 years experience. <ul style="list-style-type: none"> ▪ <i>Noise and Vibration Study, Air Quality Study, Natural Environment Study (NES)</i>
Paul Mitchell Project Manager	B.S. Civil Engineering; A.A. Associate in Arts; 13 years experience. <ul style="list-style-type: none"> ▪ <i>Noise and Vibration Study, Air Quality Study, Natural Environment Study (NES)</i>
Tom Roberts Senior Biologist	M.S. Wildlife Biology; B.A. Anthropology; 26 years experience. <ul style="list-style-type: none"> ▪ <i>Natural Environment Study (NES)</i>
Yolanda Molette Plant Ecologist	M.A. Conservation Biology; B.A. Biological Sciences; 9 years experience in plant and wetland ecology. <ul style="list-style-type: none"> ▪ <i>Natural Environment Study (NES)</i>
Bob Vranka Senior Environmental Scientist	Ph.D. Chemical Physics; B.S. Physics and Chemistry; 27 years experience. <ul style="list-style-type: none"> ▪ <i>Air Quality Study</i>

Win Lindeman Senior Technical Associate	M.S. Teaching; B.S. Biology and Geology; 36 years experience. <ul style="list-style-type: none"> ▪ <i>Noise and Vibration Study</i>
John Shearer (Wilson, Ihrig & Associates) Associate Principal	B.E. Mechanical Engineering; M.Sc. Engineering Acoustics; 29 years experience. <ul style="list-style-type: none"> ▪ <i>Noise and Vibration Study</i>
Steven L. Wolfe (Wilson, Ihrig & Associates) President	B.S. Engineering; M.S. Mechanical Engineering; 34 years experience. <ul style="list-style-type: none"> ▪ <i>Noise and Vibration Study</i>

Jones & Stokes Associates, Inc.

Dana McGowan Principal	M.A. Anthropology; B.A. Anthropology; 19 years experience in cultural resources management. <ul style="list-style-type: none"> ▪ <i>Archaeology Survey Report</i> ▪ <i>Native American Tribal Issues Coordination</i>
Lesley Fryman Senior Historian/Archaeologist	B.A. Anthropology; 21 years experience in cultural resources management. <ul style="list-style-type: none"> ▪ <i>Archaeology Survey Report</i>
Stacy Schneyder Case Historical Archaeologist	M.A. Cultural Resources Management; B.A. Anthropology; 9 years experience in cultural resources management. <ul style="list-style-type: none"> ▪ <i>Archaeology Survey Report</i>
Trish Fernandez Historical Archaeologist	M.A. Anthropology; B.A. Anthropology; 9 years experience in cultural resources management. <ul style="list-style-type: none"> ▪ <i>Archaeology Survey Report</i>

JRP Historical Consulting

Meta Bunse Partner Historian/Architectural Historian	M.A. Public History; 15 years experience in cultural resources management and architectural history. <ul style="list-style-type: none"> ▪ <i>Historic Architectural Survey Report (HASR)</i> ▪ <i>Finding of Effect (FOE)</i>
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Christopher McMorris Staff Historian	M.S. Historic Preservation; 7 years experience in cultural resources management and architectural history. <ul style="list-style-type: none"> ▪ <i>Finding of Effect (FOE)</i>
Bryan Larson Staff Historian	M.A. candidate Public History; 7 years experience in cultural resources management and architectural history. <ul style="list-style-type: none"> ▪ <i>Historic Architectural Survey Report (HASR)</i>
Stephen Mikesell (Principal, formerly with JRP)	M.A. History; 21 years experience in cultural resources management and architectural history. <ul style="list-style-type: none"> ▪ <i>Historic Architectural Survey Report (HASR)</i>

LTD Engineering

Glenn Dearth, PE Principal	B.S. Civil Engineering; 32 years experience in civil engineering. <ul style="list-style-type: none"> ▪ <i>Utility Relocation Plan and Cost Estimate</i>
-------------------------------	--

MGE Engineering

Kang Chen, PE Supervising Engineer Tunnel Report/APS	M.S. in Structural Engineering; B.S. in Bridge/Tunnel Engineering; 22 years experience in bridge/tunnel engineering. <ul style="list-style-type: none"> ▪ <i>Preliminary Engineering</i> ▪ <i>Advanced Planning Study (Bridges & Tunnel Structures)</i>
Mark Salmon, SE Supervising Engineer Tunnel Report/APS	M.S. in Structural Engineering; B.S. in Civil Engineering; 23 years experience in structure/bridge/tunnel engineering. <ul style="list-style-type: none"> ▪ <i>Preliminary Engineering</i> ▪ <i>Advanced Planning Study (Bridges & Tunnel Structures)</i>

MPA Design

<p>Michael Painter, FASLA Presidio Parkway Architect Landscape and Urban Designer</p>	<p>M.A. Urban Design, B.A. Landscape Architecture; 38 years experience in community involvement, site planning, landscape and urban design.</p> <ul style="list-style-type: none"> ▪ <i>Presidio Parkway Design</i> ▪ <i>Preliminary Engineering</i>
<p>Darcie Delashmutt Associate</p>	<p>B.A. Landscape Architecture; 8 years experience in site planning, landscape and urban design.</p> <ul style="list-style-type: none"> ▪ <i>Preliminary Engineering</i>

MSA Design and Consulting

<p>Cris Subrizi, PE Principal</p>	<p>B. Eng. Civil Engineering; 16 years of engineering experience in design and construction.</p> <ul style="list-style-type: none"> ▪ <i>Preliminary Engineering</i> ▪ <i>Advanced Planning Study (Bridges & Tunnel Structures)</i>
<p>Robyn Mutobe Principal</p>	<p>M.S. Structural Engineering; 16 years experience</p> <ul style="list-style-type: none"> ▪ <i>Preliminary Engineering</i> ▪ <i>Advanced Planning Study (Bridges & Tunnel Structures)</i>

Past Forward

<p>Rebecca Allen Principal Investigator</p>	<p>Ph.D. Historical Archaeology; M.A. American Civilization; B.A. Classics and Anthropology; 11 years experience in cultural resources management.</p> <ul style="list-style-type: none"> ▪ <i>Archaeology Survey Report</i>
<p>Scott Baxter Historical Archaeologist</p>	<p>M.A. Anthropology; B.A. Anthropology; 11 years experience in cultural resources management.</p> <ul style="list-style-type: none"> ▪ <i>Archaeology Survey Report</i>

The Resource Group Consultants, Inc.

Linda Amato, AICP Document Manager/Author	M.U.R.P., Community Planning and Design; B.A. Art History; 21 years experience in community planning, environmental documentation, and technical writing. <ul style="list-style-type: none">▪ <i>Environmental Documentation</i>▪ <i>Cumulative Effects Analysis</i>
Scott Rozenbaum Senior Environmental Scientist	M.S., Soil Science; B.S. Geology; 21 years experience in environmental planning. <ul style="list-style-type: none">▪ <i>Environmental Documentation</i>
Trudy Sullivan Senior Communications Specialist	B.A. Journalism and Public Relations; 13 years experience in technical writing and graphic design. <ul style="list-style-type: none">▪ <i>Environmental Documentation</i>▪ <i>Graphic Design</i>

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