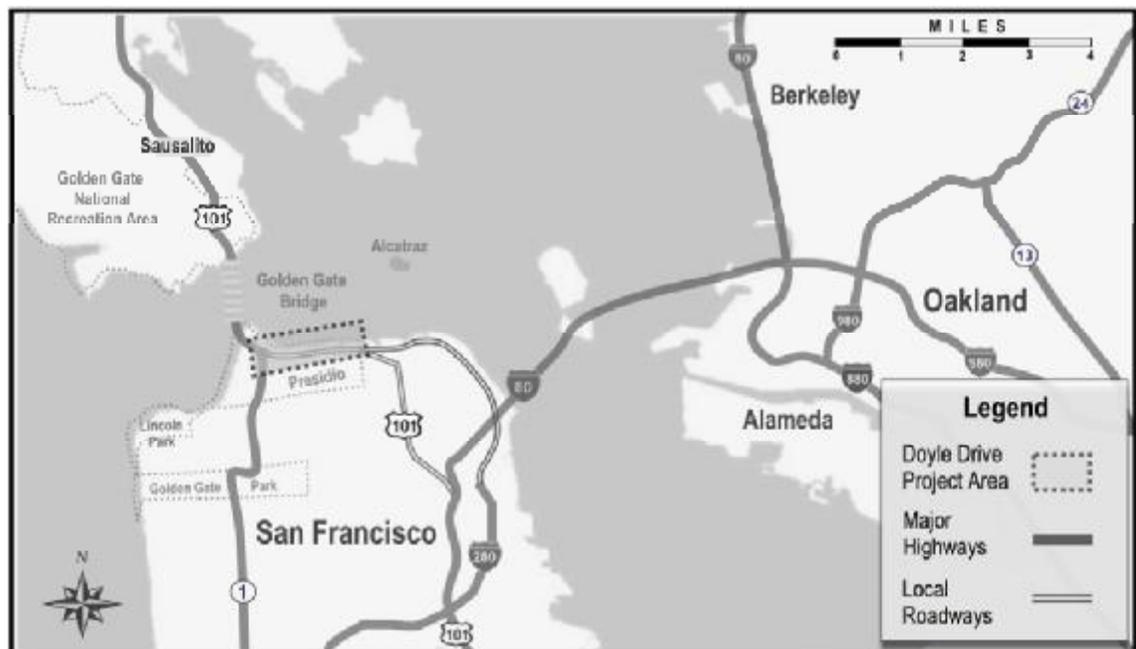


SUMMARY

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

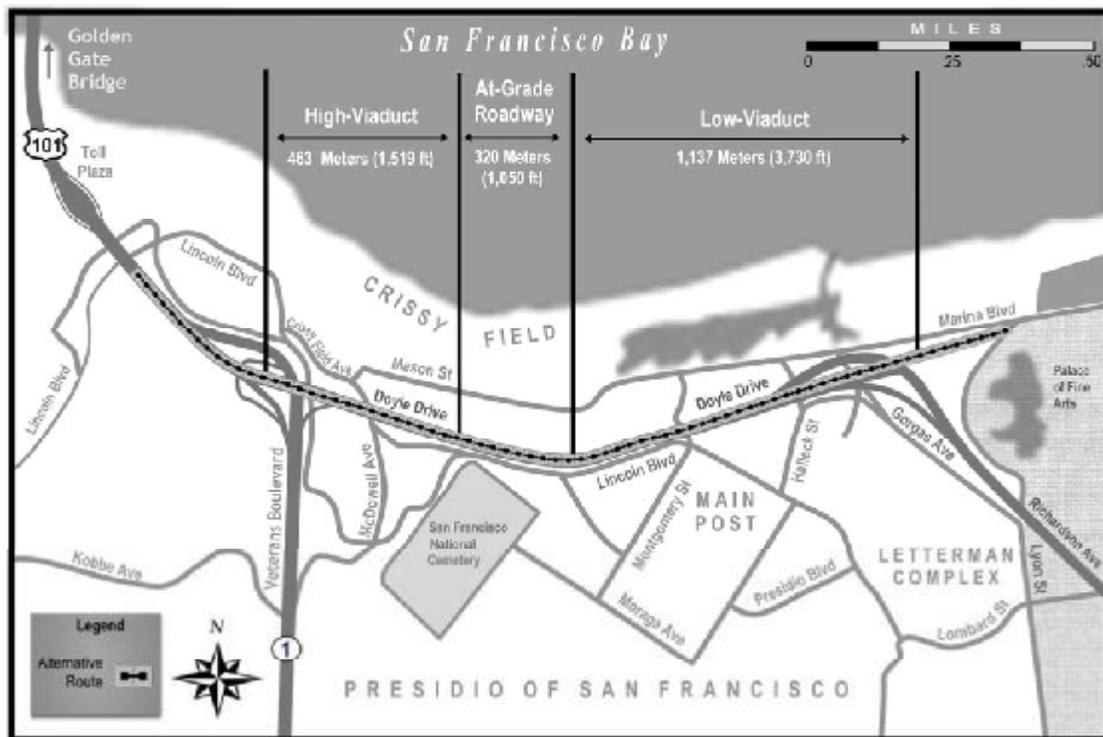
Typically in an environmental analysis, two types of alternatives are analyzed – build alternatives (can range from one alternative to many alternatives) and a No-Build Alternative which means the project would not be built and the facility would remain as is. Bi-annual inspections, regular maintenance 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.

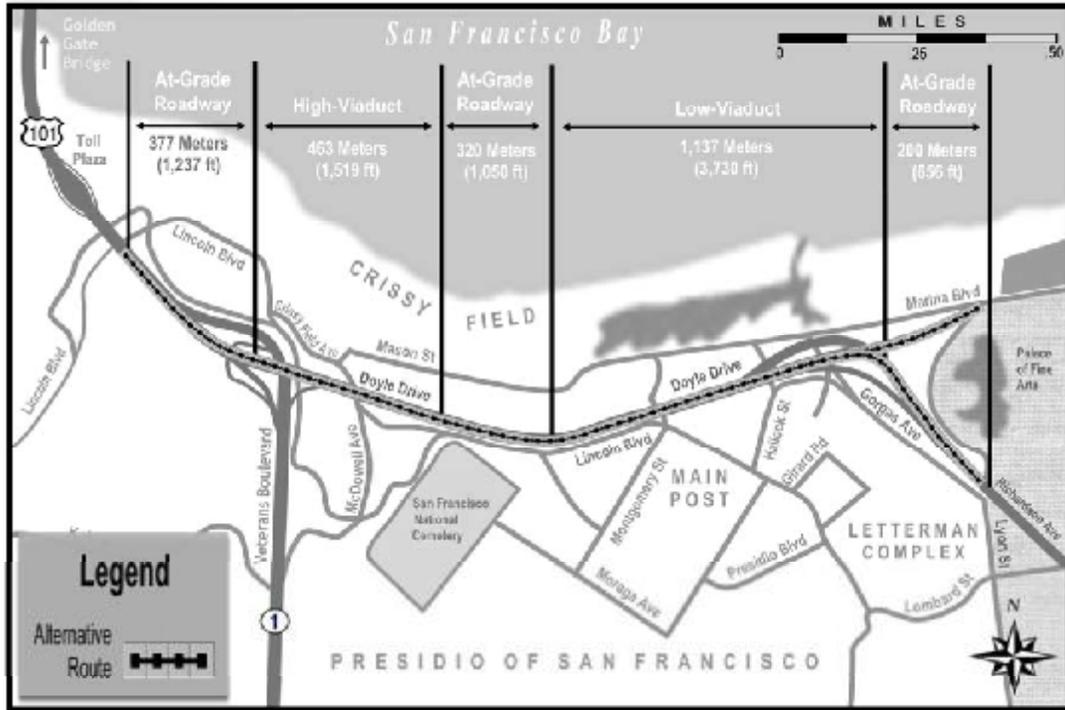
Alternative 2: Replace and Widen Alternative

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.

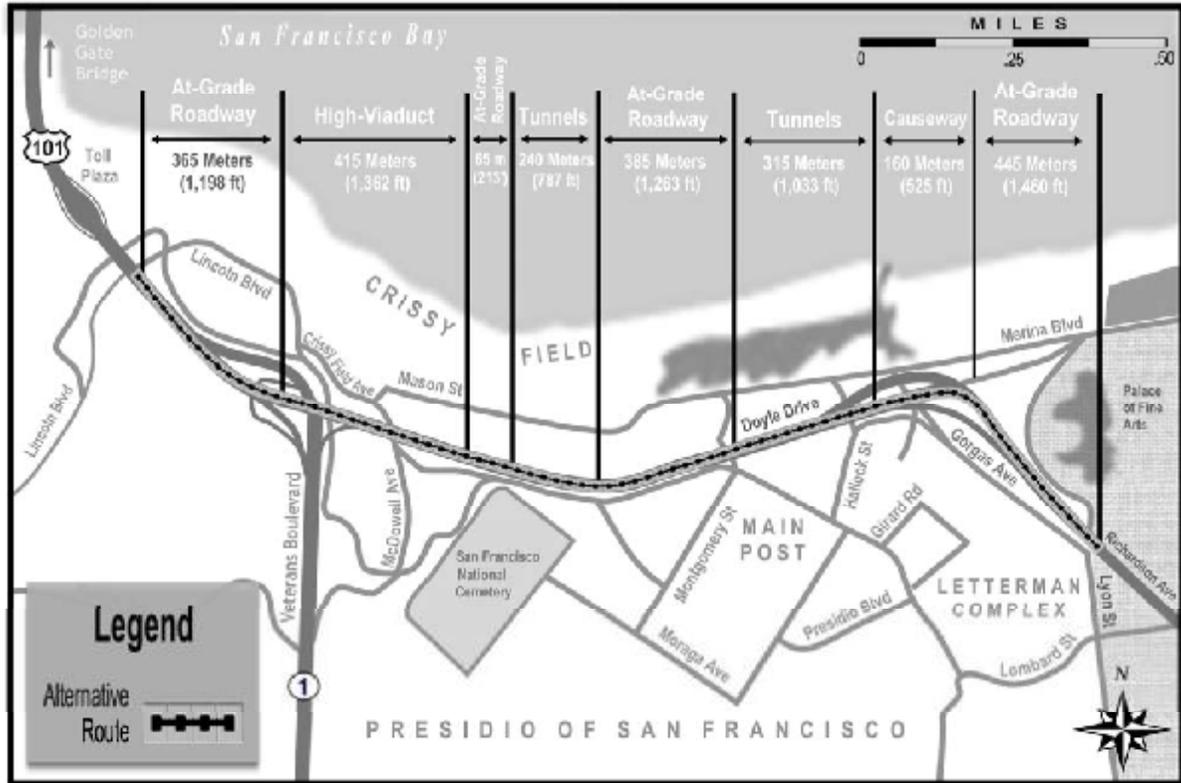
Based on the realignment of Doyle Drive, the Park Presidio Interchange would be reconfigured. The exit ramp from southbound Doyle Drive to southbound Veterans Boulevard would be replaced with standard exit ramp geometry and widened to two lanes. The loop of the northbound Doyle Drive exit ramp to southbound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

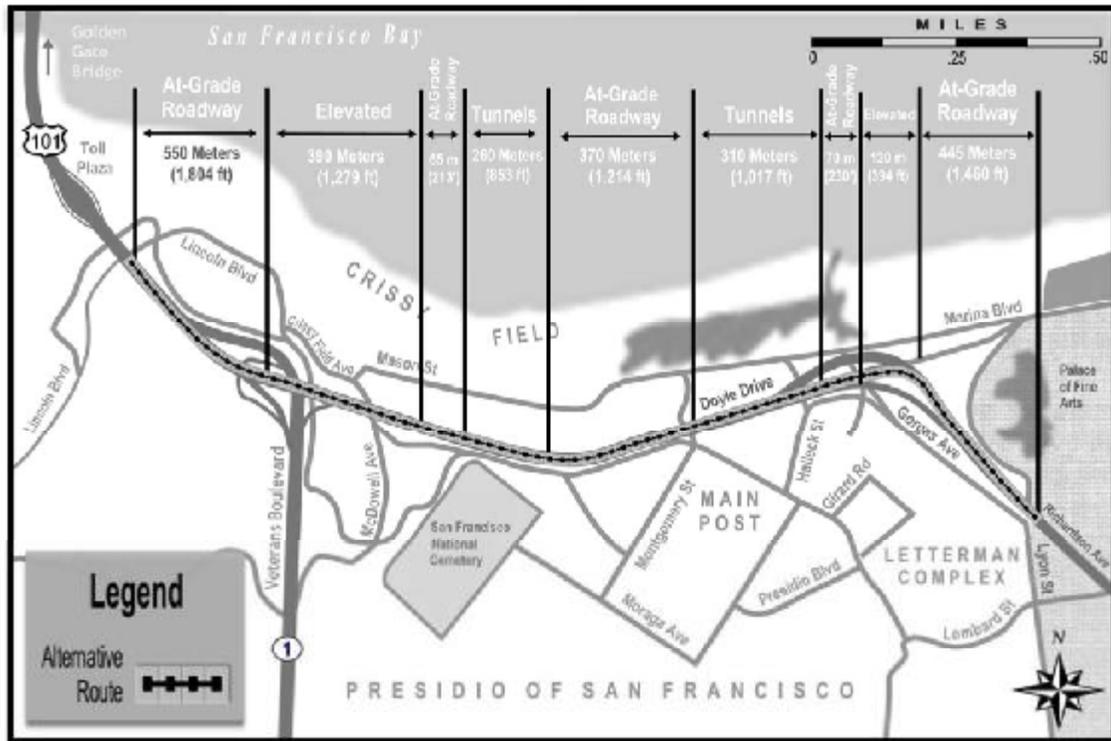
The recommendations were: Alternative 5, Presidio Parkway, with specific design elements including the modified Hook Ramp Option for the Presidio Parkway Interchange and the Diamond Option for Presidio Access. The groups did not support including the Merchant Road Slip Ramp Option.

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 (38,494 ft ²) total building area (Diamond) and 5,559 m ² (60,393 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 change 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 change 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 change 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 change 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 change 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