

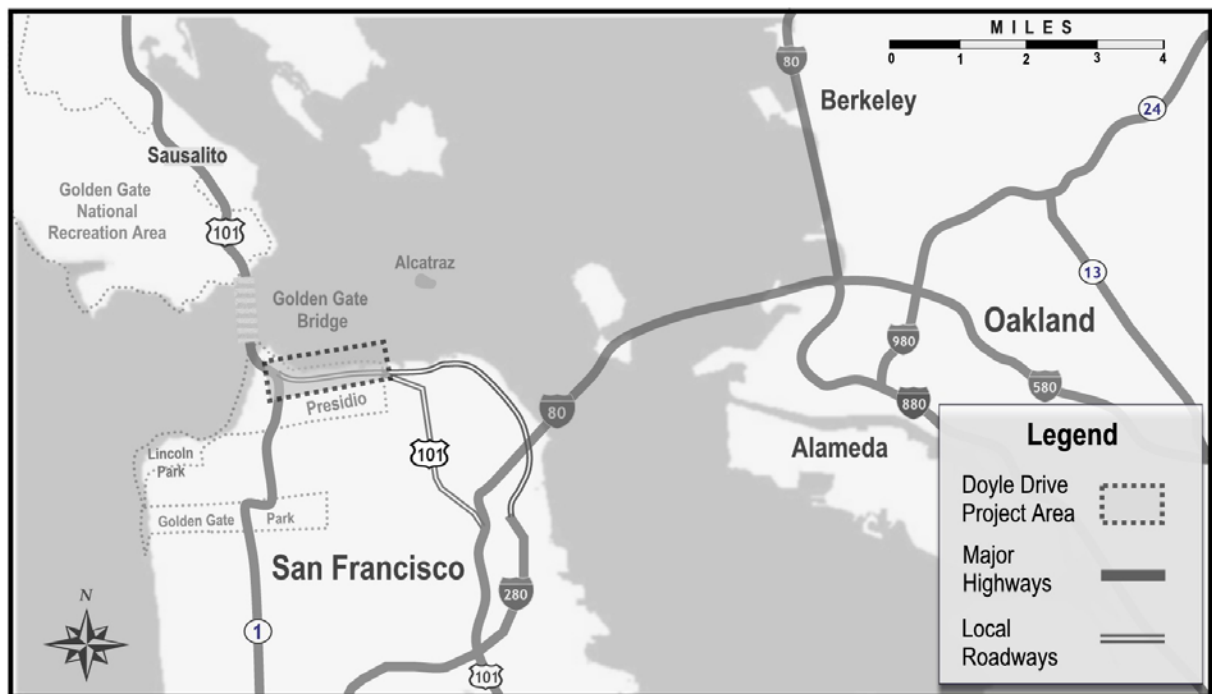
## SUMMARY

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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. It also provides limited access to the Presidio of San Francisco (the Presidio) (see **Exhibit S-1**). 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 Authority<sup>1</sup> (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,<sup>2</sup> the Golden Gate Bridge, and the Palace of Fine Arts.

Exhibit S-1  
Regional Context of Doyle Drive



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<sup>1</sup>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.

<sup>2</sup>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 projects in the Presidio have also been underway or analyzed. These projects include: Some of these plans include: the National Park Service's

*General Management Plan Amendment*; the Presidio's *Vegetation Management Plan (VMP)*; the *Presidio Trails and Bikeways Master Plan*; and the *Presidio Trust Management Plan (2002)*, and the Golden Gate Highway and Bridge District's *Ten Year Capital Plan*.



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;
- to maintain the functions that the Doyle Drive corridor serves as part of the regional and city transportation network;
- to improve the functionality of Doyle Drive as an approach to the Golden Gate Bridge;
- to preserve the natural, cultural, scenic and recreational values of affected portions of the Presidio, a national historic landmark district;
- to 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);
- to 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;

- to minimize the traffic impacts of Doyle Drive on the Presidio and local roadways;
- to improve intermodal and vehicular access to the Presidio; and
- to redesign the Doyle Drive corridor using the parkway concept described within the *Doyle Drive Intermodal Study (1996)*.

Doyle Drive, an almost seventy-year-old roadway, is approaching the end of its useful life. 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 project need. .

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

ELEMENT	DEFICIENCY	RESULT
STRUCTURE	<ul style="list-style-type: none"> <li>▪ Age of the facility</li> <li>▪ The effects of heavy traffic</li> <li>▪ Exposure to salt air</li> </ul>	Seismically and structurally unsafe
LOCATION	Eastern portion is located in an identified liquefaction <sup>1</sup> zone	Potential structural failure during an earthquake
DESIGN	1937 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

<sup>1</sup>Liquefaction 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) environmental 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 an agency take responsibility for complying with state environmental regulations. The lead CEQA agency for the Doyle Drive project is the San Francisco County Transportation Authority (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 and the Golden Gate Bridge, Highway and Transportation District 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:

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

To satisfy both NEPA and CEQA requirements, the four agencies, with input from the three cooperating 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 meetings<sup>3</sup> were conducted in early 2000. As a result of these meetings, screening criteria were developed to help evaluate alternatives and access options.

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

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,<sup>4</sup> 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;
- rehabilitate the existing structure;
- build a new facility in a new location; and
- rebuild a facility in the same corridor (In Corridor).

As part of the In Corridor Concept, four scenarios were evaluated: 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 in 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 east- and westbound 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

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<sup>4</sup>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.

to allow a low level causeway to pass over the Presidio's area of possible marsh expansion.

Access to the Presidio is provided via signalized intersections at an extension of Girard Road to Marina Boulevard. The Parkway Alternative has several options including two east-end Presidio access options, two Veterans Boulevard interchange options, and a slip ramp to Merchant Road.

## **Alternatives for Further Study**

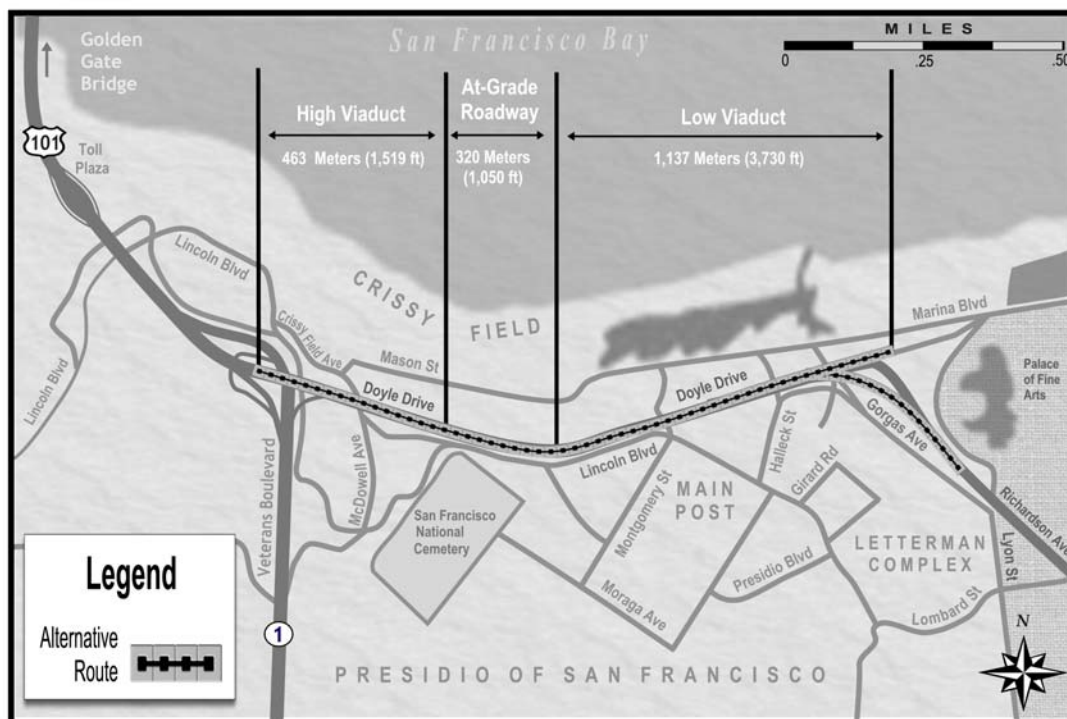
Typically in an environmental analysis, two types of alternatives are analyzed – build alternatives (can range from one alternative to many alternatives) and a No-Build Alternative. A No-Build Alternative represents the baseline. All other alternatives are compared to the no-build. For this document, alternatives moved forward for further study included the No-Build Alternative and two build alternatives. 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 three meters (9.5 to ten feet) wide. No fixed median barriers or shoulders currently existing on Doyle Drive, and 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 eight to ten 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.

Under the No-Build Alternative interim repairs would be required to maintain operations on the high-viaduct. The high-viaduct rehabilitation would include 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 is programmed for Fiscal Year (FY) 2005/6. 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 as having a weight

**Exhibit S-3  
Alternative 1: No-Build**



restriction, buses and trucks will have to take alternate routes. **Exhibit S-3** presents the general location and configuration of this alternative.

***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. The height of the high-viaduct would vary from twenty to thirty-five meters (sixty-six to 115 feet) above the ground surface. The low-viaduct would have an average height of approximately eight to ten meters (twenty-six to thirty-three feet). 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 3.0-meter (ten-foot) outside and inside shoulders. In addition, the facility would include a 3.6-meter (12-foot) auxiliary lane in the eastbound 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 westbound 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 and Lincoln Boulevard, reducing the facility width to 32.4 meters (106 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.

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. 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 can not be accommodated due to geometric constraints and concerns for traffic safety.

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 (sixty-seven 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.

**Exhibit S-4** presents the general location and configuration of this Replace and Widen Alternative.

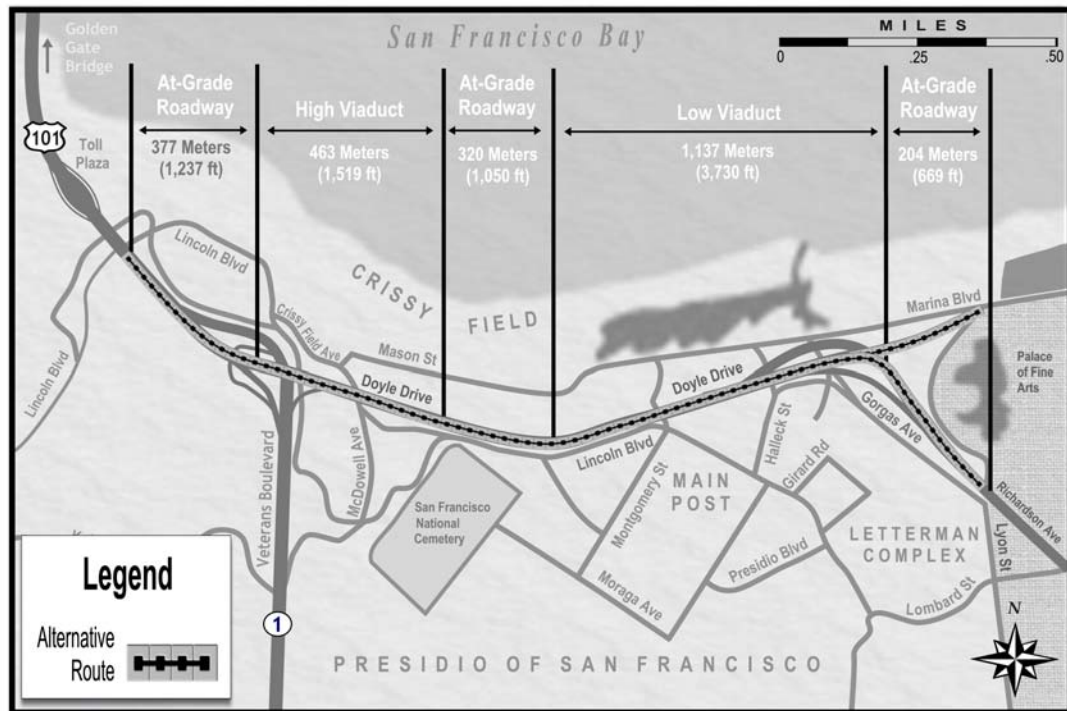
#### ***Alternative 5: Presidio Parkway Alternative***

The Presidio Parkway Alternative 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. The new facility would consist of two 3.3-meter (eleven-foot) lanes and one 3.6-meter (twelve-foot) outside lane in each direction with 3.0-meter outside shoulders and 1.2-meter inside shoulders. In addition, a 3.3-meter (eleven-foot) auxiliary lane runs along southbound Doyle Drive from the Park Presidio Interchange to the Girard Road exit ramp. The width of the proposed landscaped median varies from five meters (sixteen feet) to 12.5 meters (forty-one feet).

Based on the realignment of Doyle Drive, the Veterans Boulevard interchange would be reconfigured. The exit ramp from eastbound Doyle Drive to southbound Veterans Boulevard would be replaced with standard exit ramp



Exhibit S-4  
Alternative 2: Replace and Widen



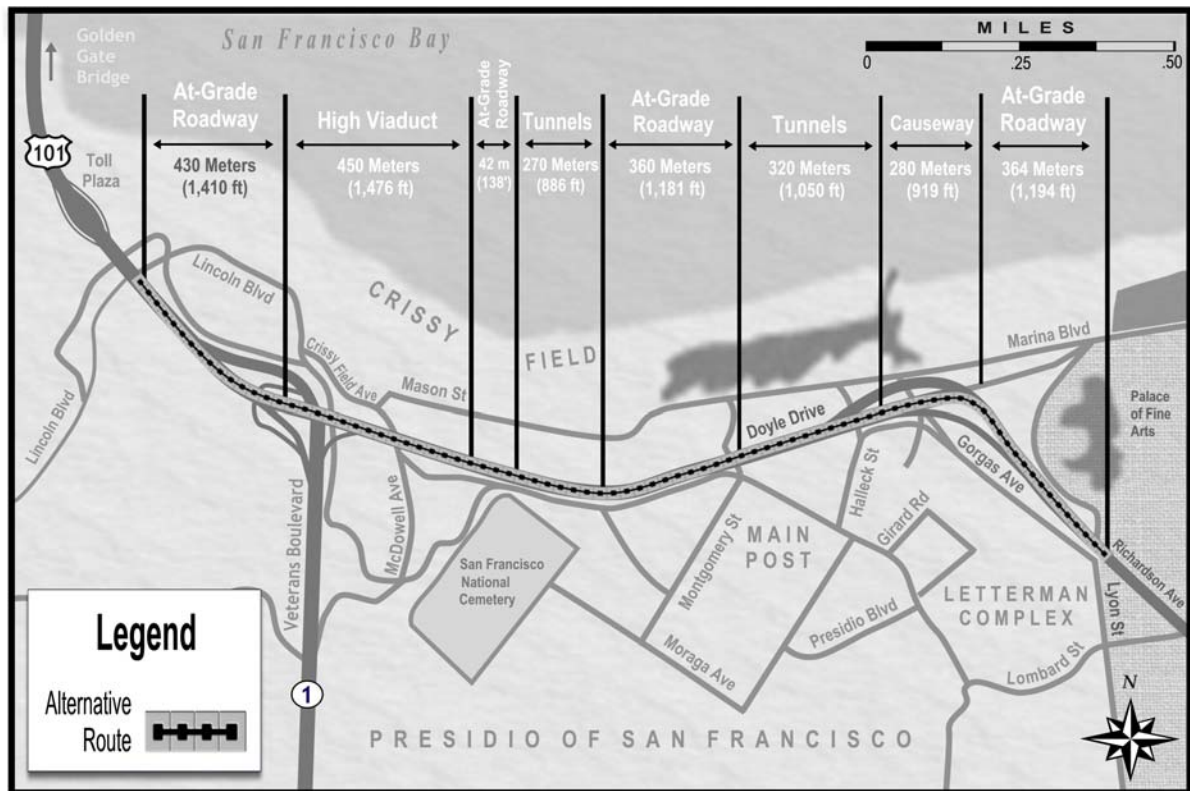
geometry and widened to two lanes. The loop of the westbound Doyle Drive exit ramp to southbound Veterans Boulevard would be improved to provide standard exit ramp geometry. The northbound Veterans Boulevard connection to westbound Doyle Drive would be realigned to provide standard entrance ramp geometry. There are two options for the northbound Veterans Boulevard ramp to an eastbound 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.

Exhibit S-5  
Alternative 5: Presidio Parkway



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** – The Circle Drive option provides direct access to the Presidio and indirect access to Marina Boulevard for eastbound traffic by access ramps connecting to a grade-separated interchange of Girard Road. Westbound traffic from Richardson Avenue would access the Presidio through a jug handle intersection with Gorgas Avenue.

Exhibit S-5 presents the general location and configuration of this alternative.

## S.5 Project Costs

The estimated total costs for each of the alternatives have been developed. Exhibit S-6 presents these estimated construction costs. These costs are based on 2003 unit prices and are presented in 2004 dollars. These cost estimates are conceptual and are based on available information that was available during the preparation of the environmental document regarding the preliminary alignments, existing utilities, historic construction costs, and quotations from various local suppliers and contractors.

**Exhibit S-6**  
**Estimated Construction Cost of Project Alternatives**  
(in 2005 dollars)

ALTERNATIVE	OPTION	ROADWAY	STRUCTURES	TOTAL		
1	NO-BUILD	0	0	\$0		
2	REPLACE AND WIDEN	No Detour	80,200,000	460,600,000	\$552,800,000	
		With Detour	94,900,000	490,700,000	\$585,600,000	
5	PRESIDIO PARKWAY	Diamond	Loop Ramp	141,200,000	559,973,000	\$701,200,000
			Hook Ramp	146,400,000	543,604,000	\$690,000,000
	Circle	Loop Ramp	141,200,000	559,973,000	\$701,200,000	
		Hook Ramp	146,300,000	543,604,000	\$689,900,000	
		Merchant Ramp	7,700,000	900,000	\$8,600,000	

## S.6 Summary of Permanent Impacts

Potential permanent impacts resulting from each alternative are summarized in **Exhibits S-7 through S-9** (located at the end of this Summary). Temporary impacts as well as proposed avoidance, minimization, and mitigation are discussed in Chapter 3 of this environmental document.

## S.7 Potential Permits

Based on the analyses and findings of this environmental document, potential permits have been identified. Once a preferred alternative is selected and final design moves forward, necessary permits will be confirmed. Coordination, consultation, and preparation of permit documents will be initiated by the project proponent. Permits from the following agencies are anticipated:

- City of San Francisco
- Golden Gate Bridge, Highway and Transportation District
- California Department of Fish and Game
- U.S. Army Corps of Engineers
- Regional Water Quality Control Board

In addition, an agreement to obtain right of way from the Presidio Trust to build the proposed facility would be necessary. Currently, no agreement has been drafted. In addition, an agreement between the city and county of San Francisco (CCSF) and Caltrans would be necessary since the proposed project would overlap into CCSF streets, which would require modifications to existing traffic signals.

A Memorandum of Agreement (MOA) between the FHWA, NPS, Trust, VA, SFCTA, Caltrans, Advisory Council on Historic Preservation (ACHP), and California State Historic Preservation Officer (SHPO) is currently in development. The document records the terms and conditions agreed upon to resolve the adverse effects of the project upon the National Historic Landmark..

## S.8 Preferred Alternative

The FEIS/R will identify a preferred alternative. FHWA will select this alternative based on:

- collaboration with and input from Caltrans, the Authority, and the cooperating agencies;
- findings from the DEIS/R; and
- state and federal agency, local government, tribal, and public comments.

## S.9 Next Steps

After publishing and circulating (for public review and comment) this Draft Environmental Impact Statement/Report (DEIS/R), the sponsor agencies will follow the typical NEPA/CEQA procedure:

- conduct a public hearing on this DEIS/R (Winter 2006);
- provide a public comment period where interested parties can submit written comments on this document (Winter 2006);
- select a Preferred Alternative (Spring 2006);
- develop and circulate a Final Environmental Impact Statement/Report (FEIS/R). The FEIS/R will address comments received on the DEIS/R (Summer 2006); and
- issue a NEPA Record of Decision (ROD) and a CEQA Notice of Determination. This will allow the sponsor agencies to move forward with final design and permitting (Fall 2006).

**Exhibit S-7**  
**Summary of Permanent Impacts: Human Environment**

RESOURCE	ALTERNATIVE 1: NO-BUILD	ALTERNATIVE 2: REPLACE AND WIDEN NO DETOUR OPTION	ALTERNATIVE 2: REPLACE AND WIDEN DETOUR OPTION	ALTERNATIVE 5: PRESIDIO PARKWAY DIAMOND OPTION	ALTERNATIVE 5: PRESIDIO PARKWAY CIRCLE DRIVE OPTION
Land Use/ Plans and Policies	-Inconsistent with the PTMP, VMP, SFGP, DDTF, and the GMPA	-Removal of 1 building -Inconsistent with the PTMP, VMP, and the SFGP	-Removal of 4 buildings -Inconsistent with the PTMP, VMP, and the SFGP	-Removal of 13 buildings -Reduces area for possible Crissy Marsh expansion -Inconsistent with the PTMP, VMP	-Removal of 13 buildings -Reduces area for possible Crissy Marsh expansion -Inconsistent with the PTMP, VMP
Parks and Recreation	-No change to current conditions	-Loss of 0.9 hectares (2.2 acres)	-Loss of 0.6 hectares (1.5 acres)	-Loss of 4.6 hectares (11.4 acres) - <i>Merchant Road Slip Ramp:</i> require an additional 05. hectares (1.2 acres)	-Loss of 4.5 hectares (11.1 acres) -Removal of swimming pool - <i>Merchant Road Slip Ramp:</i> require an additional 05. hectares (1.2 acres)
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	-Since this alternative does not provide direct access to the Presidio, it may limit planned growth in the Presidio	-Access to the Presidio, via this alternative, is compatible with planned growth in the Presidio	-Access to the Presidio, via this alternative, is compatible with planned growth in the Presidio
Community Impacts	-No change to current conditions	Need for 1 additional parking space Improve emergency access Relocation of utilities Displacement of 5 employees	Need for 20 additional parking spaces Improve emergency access Relocation of utilities Displacement of 36 employees	Need for 118 additional parking spaces Improve emergency access Relocation of utilities Displacement of 48 employees	Need for 118 additional parking spaces Improve emergency access Relocation of utilities Displacement of 68 employees
Relocation	-No change to current conditions	-Removal of 1 building	-Removal of 4 buildings	-Removal of 13 buildings	-Removal of 13 buildings
Environmental Justice	-No change to current conditions	-No change to current conditions	-No change to current conditions	-No change to current conditions	-No change to current conditions
Traffic and Transportation	- <i>Intersection Level of Service:</i> ranges from A to F - <i>Segment Level of Service:</i> ranges from B to F - <i>Weaving Level of Service:</i> ranges from B to E - <i>Pedestrian and Bicycle Operations:</i> non-ADA compliant sidewalk in use	- <i>Intersection Level of Service:</i> ranges from A to F - <i>Segment Level of Service:</i> ranges from B to F - <i>Weaving Level of Service:</i> ranges from B to E - <i>Pedestrian and Bicycle Operations:</i> Removal of sidewalk, other trails within the Presidio available for use	- <i>Intersection Level of Service:</i> ranges from A to F - <i>Segment Level of Service:</i> ranges from B to F - <i>Weaving Level of Service:</i> ranges from B to E - <i>Pedestrian and Bicycle Operations:</i> Removal of sidewalk, other trails within the Presidio available for use	- <i>Intersection Level of Service:</i> ranges from A to F - <i>Segment Level of Service:</i> ranges from B to F - <i>Weaving Level of Service:</i> ranges from B to E - <i>Pedestrian and Bicycle Operations:</i> Removal of sidewalk, other trails within the Presidio available for use	- <i>Intersection Level of Service:</i> ranges from A to F - <i>Segment Level of Service:</i> ranges from B to F - <i>Weaving Level of Service:</i> ranges from B to E - <i>Pedestrian and Bicycle Operations:</i> Removal of sidewalk, other trails within the Presidio available for use

**Exhibit S-7 (Continued)**  
**Summary of Permanent Impacts: Human Environment**

RESOURCE	ALTERNATIVE 1: NO-BUILD	ALTERNATIVE 2: REPLACE AND WIDEN NO DETOUR OPTION	ALTERNATIVE 2: REPLACE AND WIDEN DETOUR OPTION	ALTERNATIVE 5: PRESIDIO PARKWAY DIAMOND OPTION	ALTERNATIVE 5: PRESIDIO PARKWAY CIRCLE DRIVE OPTION
Visual and Aesthetics	-No change to existing views	-Ranges from no change to adverse depending upon the location -Adverse impacts to viewpoints at the Main Post	-Ranges from no change to adverse depending upon the location -Adverse impacts to viewpoints at the Main Post	-Ranges from beneficial to adverse depending upon the location -Adverse impacts to viewpoints at the Girard Road and Marion at Lyon	-Ranges from beneficial to adverse depending upon the location -Adverse impacts to viewpoints at the Girard Road and Marion at Lyon
Cultural Resources	-No change to existing conditions	Adverse effect to Presidio NHLD 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.	Adverse effect to Presidio NHLD by removal of Doyle Drive, alterations to NHLD 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. Adverse effect by removal of Buildings 1182, 1183, 1184, 1185 (four Mason Street Warehouses which are contributing elements of NHLD; temporary removal and replacement at their original locations after project completion is expected.). No adverse effect to Palace of Fine Arts; no adverse effect with conditions to archaeological site CA-SFr 6/26.	Adverse effect to Presidio NHLD by removal of Buildings 201, 204, 230, 670 and Doyle Drive; alterations to NHLD 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 NHLD. 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.	Adverse effect to Presidio NHLD by removal of Buildings 201, 204, 230, 670, and 1151 and Doyle Drive; alterations to NHLD 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 NHLD. 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-8  
Summary of Permanent Impacts: Physical Environment**

RESOURCE	ALTERNATIVE 1: NO-BUILD	ALTERNATIVE 2: REPLACE AND WIDEN NO DETOUR OPTION	ALTERNATIVE 2: REPLACE AND WIDEN DETOUR OPTION	ALTERNATIVE 5: PRESIDIO PARKWAY DIAMOND OPTION	ALTERNATIVE 5: PRESIDIO PARKWAY CIRCLE DRIVE OPTION
Hydrology, Water Quality, and Storm water	-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])	-Increased runoff, but no increase to pollutant loading is expected -Increase in impervious surfaces (additional 24,200 square meters [260,000 square feet])	-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 -Increase in impervious surfaces (additional 24,200 square meters [260,000 square feet])	-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, Seismic and Topography	-Earthquake could lead to failure of the low-viaduct	-Removal of soils and bedrock (5,900 cubic meters [7,700 cubic yards])	-Removal of soils and bedrock (5,900 cubic meters [7,700 cubic yards])	-Removal of soils and bedrock (92,000 cubic meters [120,000 cubic yards])	0-Removal of soils and bedrock (92,000 cubic meters [120,000 cubic yards])
Hazardous Materials and Waste	-No change to existing conditions	-No impacts, limited to temporary, construction-related activities	-No impacts, limited to temporary, construction-related activities	-No impacts, limited to temporary, construction-related activities	-No impacts, limited to temporary, construction-related activities
Air Quality	-No change to existing conditions	- No change to existing conditions	- No change to existing conditions	- No change to existing conditions	- 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	-34 locations will approach, equal, or exceed national Noise Abatement Criteria	-24 locations will approach, equal, or exceed national Noise Abatement Criteria	-24 locations will approach, equal, or exceed national Noise Abatement Criteria
Energy	-806.5 billion BTU's expended annually	-814.4 billion BTU's expended annually	-814.4 billion BTU's expended annually	-822.2 billion BTU's expended annually	-820.6 billion BTU's expended annually

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

RESOURCE	ALTERNATIVE 1: NO-BUILD	ALTERNATIVE 2: REPLACE AND WIDEN NO DETOUR OPTION	ALTERNATIVE 2: REPLACE AND WIDEN DETOUR OPTION	ALTERNATIVE 5: PRESIDIO PARKWAY DIAMOND OPTION	ALTERNATIVE 5: PRESIDIO PARKWAY CIRCLE DRIVE OPTION
Natural Communities	-No change to existing conditions	-Removal of 2.94 hectares (7.28 acres) of plant communities other than wetlands	-Removal of 2.73 hectares (6.75 acres) of plant communities other than wetlands	-Removal of 5.03 hectares (12.44 acres) to 21.23 hectares (52.45 acres) of plant communities other than wetlands	-Removal of 5.03 hectares (12.44 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	<i>USACE Jurisdiction:</i> removal of .22 hectares (.54 acres) <i>Cowardin Excluding USACE:</i> removal of .07 hectares (.17 acres)	<i>USACE Jurisdiction:</i> removal of .22 hectares (.54 acres) <i>Cowardin Excluding USACE:</i> removal of .07 hectares (.17 acres)	<i>USACE Jurisdiction:</i> removal of .22 hectares (.54 acres) to .88 hectares (2.17 acres) <i>Cowardin Excluding USACE:</i> removal of .07hectares (.17 acres) to .28 hectares (.69 acres)	<i>USACE Jurisdiction:</i> removal of .22 hectares (.54 acres) to .88 hectares (2.17 acres) <i>Cowardin Excluding USACE:</i> removal of .07hectares (.17 acres) to .28 hectares (.69 acres)
Plant Species	- No change to existing conditions	-Potential removal of skunkweed and gumplant	- Potential removal of skunkweed and gumplant	- Potential removal of skunkweed and gumplant	- Potential removal of skunkweed and gumplant
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 could affect bat habitat.	-Removal of vegetation and wetlands/water (see above) could affect wildlife habitat. -Removal of existing Doyle Drive structures could affect bat habitat.	-Removal of vegetation and wetlands/water (see above) could affect wildlife habitat. -Removal of existing Doyle Drive structures could affect bat habitat.	-Removal of vegetation and wetlands/water (see above) could affect wildlife habitat. -Removal of existing Doyle Drive structures could affect bat habitat.
Invasive Species	- No change to existing conditions	-Potential for weedy, invasive plants to establish along the portions of Doyle Drive	-Potential for weedy invasive plants to establish along the portions of Doyle Drive	-Potential for weedy invasive plants to establish along the portions of Doyle Drive	-Potential for weedy invasive plants to establish along the portions of Doyle Drive