Exhibit 2-20
Access Options Considered

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

2.3 Alternatives Considered and Withdrawn

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

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

2.3.1 Eliminated During Initial Evaluation and Traffic Screening

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 Based on the findings, the following alternatives and access options were withdrawn from further study:

Retrofit Without Widening (Minimal Improvements)

This alternative was withdrawn from further consideration because minimal improvements would not provide wider travel lanes, a median barrier, or shoulders; and would not meet the project's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

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

Transit Exclusive Alternative

This alternative was withdrawn from further consideration because Doyle Drive would no longer serve its current function as part of the local and regional transportation network and would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

Veterans Boulevard (Highway 1) Alternative

This alternative was withdrawn from further consideration because a substantial amount of right of way to provide space for a total of 18 lanes at the Geary Boulevard and Veterans Boulevard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

Doyle Boulevard Alternative

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

Parallel Construction-Elevated Alternative

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

Parallel Construction-Depressed Alternative

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

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

Detour Construction-Elevated Alternative

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

Detour Construction-Depressed Alternative

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

Lombard to Lincoln Alternative

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

North of Corridor Alternative

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

Gorgas Access Option

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

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

No New Presidio Access Option

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

No Marina Access Option

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

2.3.2 Alternatives and Access Options Eliminated After Further Review

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

Phased Construction Alternatives

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

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

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

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

Detour Construction-Couplet Alternative

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

Other Adjustments to Options and Alternatives

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2.3.4 Various Design Elements

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

Lyon Street Portal

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

Tunnel Options

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

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

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

Main Post Access

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

Moveable Barrier

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

Intelligent Transportation Systems (ITS)

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

Other Design Concepts

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

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

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

2.4 Alternatives for Further Study

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