2.6 CONSTRUCTION IMPACTS

All construction activities would take place within the limits of District's existing permitted area. Potential construction impacts include temporary transportation impacts, temporary noise impacts and temporary parking displacements. All impacts would be mitigated through construction contracts agreed to by the District and their contractors. The contracts would include project-specific specifications. In addition to the contracts and specifications, the District will monitor its contractors' work and perform quality assurance testing to ensure that the work is performed in compliance with all applicable safety and environmental laws.

2.6.1 CONSTRUCTION PHASING/SCHEDULE/WORK HOURS

Construction of the new physical suicide barrier would be performed in sections, beginning on the west side of the Bridge and ending on the east side of the Bridge. It is anticipated that it would take 12 to 18 months per side to complete construction. Construction operations would be staged to minimize effects on pedestrians, cyclists and motor vehicles using the Bridge.

The work on the west sidewalk would be specified to be performed weekdays during the hours when the sidewalk is not open to the public, so as not to affect the commuter and recreational use on the west sidewalk. The work on the east sidewalk will be specified to be performed at night. If some work on the east sidewalk must be performed during the day, the project specific special provisions will require a 6-foot minimum clear passageway be maintained through the work area with appropriate traffic control and protective measures in place.

These provisions have been successfully used on the seismic retrofit project, the Public Safety Railing project and during the District's on-going maintenance and operations activities.

2.6.2 CONSTRUCTION STAGING AREAS AND STORAGE OF EQUIPMENT

Each of the build alternatives would result in the temporary use of one or more of the five proposed construction staging areas. Construction staging areas are located near the San Francisco and Marin Abutments of the Bridge, as shown on Figures 2.1-1 and 2.1-2, Number 4.

There are four proposed construction staging areas in the GGNRA. These proposed staging areas are located on the northern side of the Bridge in

Marin County below the Marin Approach and Span 4 backspan. One is an existing gravel area located in a switchback of Conzelman Road and the other three are gravel areas located under the northern span of the Bridge, which are currently being used for similar staging, maintenance activities and other Bridge operations.

There is one proposed construction staging area to the south of the Bridge, located adjacent to the Bridge toll plaza within the Presidio. The proposed area is an existing paved employee parking lot with 25 public spaces, located just west of the toll plaza off Merchant Road.

Project-related construction equipment and materials would be stored within one or more of these construction staging areas. A containment plan and Best Management Practices (BMPs) for storage activities will be incorporated in the construction contracts and project specifications to ensure that there are no environmental effects related to the storage of these materials and equipment. No expansion of the construction staging areas will be permitted.

2.6.3 TRANSPORTATION IMPACTS

Temporary Roadway Closures / Traffic Delays

From the staging areas, workers would access the activity areas on the Bridge with small customized equipment. Construction activities may require the periodic closure of vehicle travel lanes. Construction would be limited to one side of the Bridge at a time. If necessary, work requiring access from the Bridge deck would only be permitted during non-peak Bridge traffic hours; therefore, lane closures would not contribute to any increase in traffic delays. The project work may also require temporary closures of parts of Conzelman Road.

Emergency vehicle access will always be maintained during construction activities. Access should not be affected because project construction activities would not affect traffic volumes or traffic flow on the Bridge.

Parking Facilities

The five proposed staging areas will be used to accommodate the parking needs of construction equipment and supplies for the project. The Merchant Road staging area is currently used to accommodate District employee and public parking needs (25 stalls are available to the public). Temporary use of the Merchant Road parking area will displace some employee and public vehicles. There are several other areas near the Bridge that offer public parking, including the District's east parking lot below the Roundhouse Gift center and the NPS parking lot off Lincoln

Boulevard and Battery East Road. On weekends and after 3:30 p.m. during the week, the District's west parking lot adjacent to the Toll Plaza is also available for public use. The available parking supply should be sufficient to compensate for the temporary loss of 25 stalls.

Access (Vehicle, Pedestrian, Cyclists)

The proposed staging area on the south end of the Bridge (Merchant Road employee parking lot) is located in proximity to Lincoln Boulevard. Access to the Merchant Road staging area would be provided via Merchant Road, a two-lane roadway that extends between Lincoln Boulevard and Highway 101 near the toll plaza.

Access to the staging areas north of the Bridge, including those under the Bridge's northern approach, would be made via the US 101 Alexander Avenue exit and west to Conzelman Road via the Sausalito lateral. In the project area, Conzelman Road is a narrow roadway that extends underneath the Northern Viaduct.

Roadways in the project area are characterized by small radii curves, steep grades and narrow shoulders. There is no continuous system of sidewalks, bike trails or bike lands on these roads. During the movement of construction equipment and materials to staging area and construction work areas, the existing pattern of circulation on narrow roads could be temporarily detoured to minimize safety hazards for cars, buses, bikers, and pedestrians. Detours will be coordinated with the GGNRA at least two weeks in advance of closures, and closure will be of the shortest duration possible to accommodate construction activities.

Pedestrian and bicycle access to the Bridge would be maintained during construction of the project. Most construction activities would occur on weekdays during time periods when the sidewalks are closed to the public (7:00 am to 3:30 pm on the west sidewalk and dusk to 5:30 am on both sidewalks). Cyclists are granted limited access to the east sidewalk between dusk and 5:30 am. A minimum six-foot wide passageway on the east sidewalk would remain open to the public during any construction activities at that location.

2.6.4 NOISE

Roadway traffic noise determines ambient (existing) noise levels at most locations in the local vicinity of the Bridge. Traffic noise is higher closer to the roadway centerline and attenuates with distance. Secondary noise sources in the project area include aircraft, wind, and the occasional short-term event (e.g., fog horns). A representative noise measurement taken

during peak traffic hours at the toll plaza and visitor center was 73 dBA L_{eq}. Short-term peak noise measurements generated 82 dBA, L_{eq}, caused by accelerating cars or diesel buses (District et. al., 1995). Sensitive receptors in the project area include hiking trails, picnic areas, Fort Point visitor areas and scenic overlooks.

Noise from construction would be 3 to 12 dBA L_{eq} above the existing peak traffic noise levels (Ibid.). Peak noise levels of approximately 85 dBA L_{eq} could be experienced intermittently on the Bridge, as well as at staging areas and along local roads used during construction activities. The two main sources would be heavy-duty trucks and construction equipment. Noise from trucks would be most noticeable in areas where heavy-duty trucks are historically less frequent, such as Conzelman Road and Merchant Road. Noise increases on Highway 101 would not be noticeable since there are already a high number of vehicles travelling across the Bridge daily, including heavy-duty trucks. To protect construction workers who would be exposed to more long-term exposure to high noise levels, noise protection measures for construction workers would be incorporated into the construction contracts and project specifications.

Visitors within about 100 feet of the noise source could experience an increase in noise levels. However, because noise receptors in the project area already experience high traffic-related noise levels, it is not clear how perceptible the noise increase would be. Noise from line sources (such as a roadway) generally attenuates at a rate of 3.0 dBA per doubling of distance from the noise source and, in this case, any increase in noise would not be noticeable. The visitor areas are separated from the proposed construction areas by both topographic change and distance and it is anticipated that the exposure to visitors to construction noise would not generally be perceptible and would be of limited duration.

2.6.5 AIR QUALITY

The project would contribute to short-term emissions of nitrogen oxides (NO_x), carbon monoxide (CO) and hydrocarbons (HC) from fuel combustion associated with the operation of diesel construction equipment and employee vehicle trips. Heavy-duty diesel trucks used to deliver materials to the site from various parts of the Bay Area would generate emissions, but these trips are anticipated to be short in duration. Other mobile equipment on the site during construction would include cranes, wheeled loaders and boom trucks. Fugitive dust would be created as heavy equipment travels from the staging areas to the Bridge. Consistent with the Bay Area Air Quality Management District (BAAQMD) Rules and Regulations, dust and diesel emissions would be reduced through site control measures such as watering and reducing construction vehicle

idling. These control measures would be incorporated into the construction contracts and project specifications.

The construction workers would also generate mobile source emissions from their vehicles during their travel to and from the project site. Mobile sources of NO_x, CO, HCs and fugitive dust would be higher on peak materials delivery days when the heavy diesel truck trips are combined with employee trips and operation of on-site construction equipment. These emissions would be temporary and would not lead to long-term deterioration of air quality.

Stationary sources of HCs from spray paint guns would be limited by the BAAQMD Rules and Regulations. These regulations would be specified in the construction contracts, thus limiting HC emissions.

2.6.6 SOIL DISTURBANCE AND EROSION CONTROL

The four staging areas within GGNRA lands are denuded of vegetation and are covered by gravel and compacted dirt. These areas have and/or continue to be used for staging and maintenance activities associated with the Golden Gate Bridge Seismic and Wind Retrofit Project. Invasive plant species currently occur in various densities in areas bordering the staging areas. Soil disturbance and the unintentional introduction of seeds by construction equipment could result in the further introduction and spread of invasive plant species.

The following avoidance measures, which have successfully been implemented as part of the Golden Gate Bridge Seismic and Wind Retrofit Project, would continue to be implemented as part of the proposed project to control erosion and prevent the spread of invasive plant species.

- The District will provide specifications for erosion control to the contractor, which will be implemented.
- The biological ECM will conduct regular visits of the staging areas to ensure that erosion control devices located near native vegetation and Environmentally Sensitive Areas (ESA) are functioning properly, and to evaluate if weed control measures need to be implemented. ESAs are areas that are fenced off to protect sensitive species and habitats.
- Based on the findings of the site visits, the biological ECM will make recommendations to be implemented regarding weed control.
- To prevent the introduction of non-native vegetation or other deleterious materials to GGNRA lands, the District and contractor will inspect all construction equipment prior to accessing the staging areas. If any vegetation or deleterious materials are present, the contractor

will decontaminate its equipment with a high-pressure washer and properly dispose of the wastewater and debris prior to entering GGNRA lands.

2.6.7 HAZARDOUS MATERIALS

The build alternatives would all require physical attachment of the new physical suicide deterrent system to the Bridge. The existing steel on the Bridge is painted with paint systems consisting of red iron oxides, lead and zinc compounds, and/or barium sulfates. Any work that would disturb the existing paint system could potentially expose construction workers to health hazards and would produce surface preparation debris containing heavy metal in amounts that exceed the hazardous thresholds established in the California Code of Regulations. This information would be included in the project specifications and the construction contracts would require the containment, collection and appropriate handling and licensed disposal of all removed materials painted with the existing paint system and other debris produced as a result of the work, in accordance with all applicable federal, state, and local hazardous waste laws. All of the District's contract specifications for projects that disturb the existing paint system include provisions informing the contractor of the existing paint systems and require that the contractor follow all applicable laws to ensure that the health of all employees and the public, as well as the environment, are protected during the work.

Another potential contamination may be associated with the use and transport of hazardous materials including fuels, oils and other chemicals (e.g., paints, adhesives) used during construction. It is likely that during construction activities these hazardous materials and vehicles would be stored by the contractor(s) on site. Improper use, storage, or disposal of hazardous materials during construction could result in accidental release of spills, potentially posing health risk to workers, the public and the environment.

Appendix E provides a section from a recent District contract that includes provisions for the handling of hazardous materials. As noted in the example contract, the contractor will be required to conduct all activities associated with the transport or use of hazardous materials in full compliance with, applicable Environmental Laws and applicable additional health and safety rules and regulations pertaining to hazardous substances and hazardous materials. Contractor will be required to insure that all temporary hazardous waste storage facilities comply with these Special Provisions and requirements of the U.S. Environmental Protection Agency and the State of California hazardous waste regulations. A project specific

specification will be developed and included in the construction contract should this project move forward with any of the build alternatives.

2.6.8 BIOLOGICAL RESOURCES

The proposed project does not include the development or direct disturbance of plant communities or aquatic habitats. The Bridge is in a developed condition and the proposed staging areas are denuded of vegetation and are covered by gravel and compacted dirt, or paved.

However, given the proximity of the proposed staging areas within GGNRA lands to large expanses of coastal scrub habitat, and the known presence of Mission blue butterfly and the potential presence of special-status plant species within adjacent and nearby areas, the use of the staging areas could result in the loss of special-status species and the degradation of adjacent habitats. Potential biological impacts associated with construction and implementation of the project were identified in Section 2.4.

To avoid construction impacts to sensitive and protected biological resources as well as protect the area from invasive species, the following avoidance measures currently being implemented as part of the Golden Gate Bridge Seismic and Wind Retrofit Project would continue to be implemented.

Measure 1: A qualified biologist or biologists will be retained by the District prior to the start of construction to act as a biological Environmental Compliance Monitor (ECM) and implement and oversee the below activities/measures.

- The biological ECM will flag and stake native vegetation near the staging areas within GGNRA lands as "Environmentally Sensitive Areas" and will oversee the contractor's installation of protective fencing around the designated ESA(s). Signs will be installed indicating that the fenced area is "restricted" and that all construction activities, personnel, and operational disturbances are prohibited.
- The biological ECM will prepare and provide worker educational materials that describe the value and importance of the coastal scrub habitat bordering the staging areas and the importance of not disturbing the habitat.
- The biological ECM will conduct regular visits of the staging areas to inspect if any damage to adjacent habitats has occurred, to evaluate if dust control measures need to be implemented or increased, to ensure that erosion control devices located near native vegetation and Environmentally Sensitive Areas (ESAs) are functioning properly, and to evaluate if weed control measures need to be implemented.

- Based on the findings of the site visits, the biological ECM will make recommendations to be implemented regarding weed control, re-vegetation of disturbed areas, the need for additional fencing, and other measures to protect biological resources.
- The biological ECM will prepare monthly monitoring reports for the District that will address the effectiveness of the avoidance measures being implemented and identify any other measures to be implemented.

Measure 2: The District will provide specifications for erosion and dust control to the Contractor, which will be implemented.

Measure 3: Contractor's vehicles traveling on access roads within GGNRA lands would be restricted to a maximum speed of 20 mph during the period of March 15 to July 4, which is the flight season for the Mission blue butterfly. The Contractor will post and enforce this speed limit.

Measure 4: To prevent the introduction of non-native vegetation or other deleterious materials to GGNRA lands, the Contractor will inspect all construction equipment prior to accessing the staging areas. If any vegetation or deleterious materials are present, the Contractor will decontaminate its equipment with a high-pressure washer and properly dispose of the wastewater and debris prior to entering GGNRA lands.

Measure 5: Prior to the implementation of construction activities the District will implement the following program to assess and avoid any impacts to peregrine falcon. This program will consist of the following activities.

- Prior to implementation of construction activities occurring during the nesting season of peregrine falcon (typically February through July), the District will consult with the Golden Gate Raptor Observatory (GGRO) and the Santa Cruz Predatory Bird Group to obtain any existing information on the locations of breeding pairs of peregrine falcon potentially using the Bridge.
- Focused surveys for nesting peregrine falcons would then be conducted by a qualified biologist to determine if nesting falcons are present in areas potentially affected by project implementation.
- If nesting falcons are identified, then a construction exclusion zone would be established around the active eyrie. The size of the exclusion zone will be determined by the CDFG and will take into account existing noise levels at the nest location and the type of construction activities proposed near the eyrie.
- Construction activities may commence within the exclusion zone only upon determination by a qualified biologist that the eyrie is no longer

active. Alternatively, construction activities potentially affecting peregrine falcons nesting on the Bridge may be conducted outside of the nesting season of the species.

Measure 6: Prior to the commencement of construction activities occurring during the nesting season of native bird species (typically February through August), the biological ECM will conduct or oversee the following activities.

- The biological ECM will conduct surveys for nesting birds protected by the Migratory Bird Treaty Act and/or California Fish and Game Code. The survey area will include potential nesting habitat within and bordering the staging and construction areas, as well as all areas that would be subject to elevated construction-related noise levels.
- If an active nest is found, a construction exclusion zone would be established around the active nest. The size of the exclusion zone will be determined by the CDFG and will take into account existing noise levels at the nest location and the sensitivity to noise of the bird species present.
- Construction activities may commence within the exclusion zone only upon determination by a qualified biologist that the nest is no longer active. The biological ECM will also survey for nesting birds during their regular site visits of the staging areas.

2.7 CUMULATIVE IMPACTS

2.7.1 REGULATORY SETTING

Cumulative impacts are those that result from past, present and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality and introduction or promotion of predators. They can also contribute to potential community impacts identified for the