

Physical Environment

2.7. Hydrology and Floodplain

The following summarizes the findings of the *Location Hydraulic Study Report* (WRECO 2009a) for the proposed project, which was completed in November 2009.

2.7.1. Regulatory Setting

Executive Order 11988 (Floodplain Management) directs all Federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The FHWA requirements for compliance are outlined in 23 CFR 650 Subpart A.

In order to comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments
- Risks of the action
- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project.

The base floodplain is defined as “the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

2.7.2. Affected Environment

The project area is within the Easton and Sanchez Creek watersheds, which drain an area of 3.3 miles. Surface water in the project limits consists of Easton Creek, Sanchez Creek, and an unnamed channel at Bayshore Highway near Airport Boulevard (Bayshore Station 9+75; see Figure 1-1). Mills Creek and the Burlingame Lagoon are nearby but outside of the project limits.

Easton Creek is north of the interchange and crosses US 101 in a 6-by-6-foot double box culvert. East of US 101, a concrete-lined channel conveys Easton Creek into another culvert beneath Bayshore Highway, which directs flows into an earthen channel that empties into San Francisco Bay. Sanchez Creek crosses US 101 in an 8-

by-10-foot triple box culvert south of the US 101/Broadway interchange and flows into the Burlingame Lagoon through an underground storm drain system. Roadway and shoulder runoff around the eastern landing of the Broadway overcrossing between US 101 and Bayshore Highway drains into a culvert pipe beneath Bayshore Highway that outfalls into the channel. The channel is unlined, and a low berm approximately 200 feet to the east prevents the channel from flowing into San Francisco Bay.

A review of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) National Flood Insurance Program Flood Insurance Rate Map (FIRM) for the City of Burlingame (Community Panel Number 065019 0002 C) indicates that the project is partially located within the 100-year floodplain, as shown in Figure 2.7-1. The base flood elevation in the project vicinity is 6.9 feet relative to the National Geodetic Vertical Datum of 1929 (FEMA 1981).

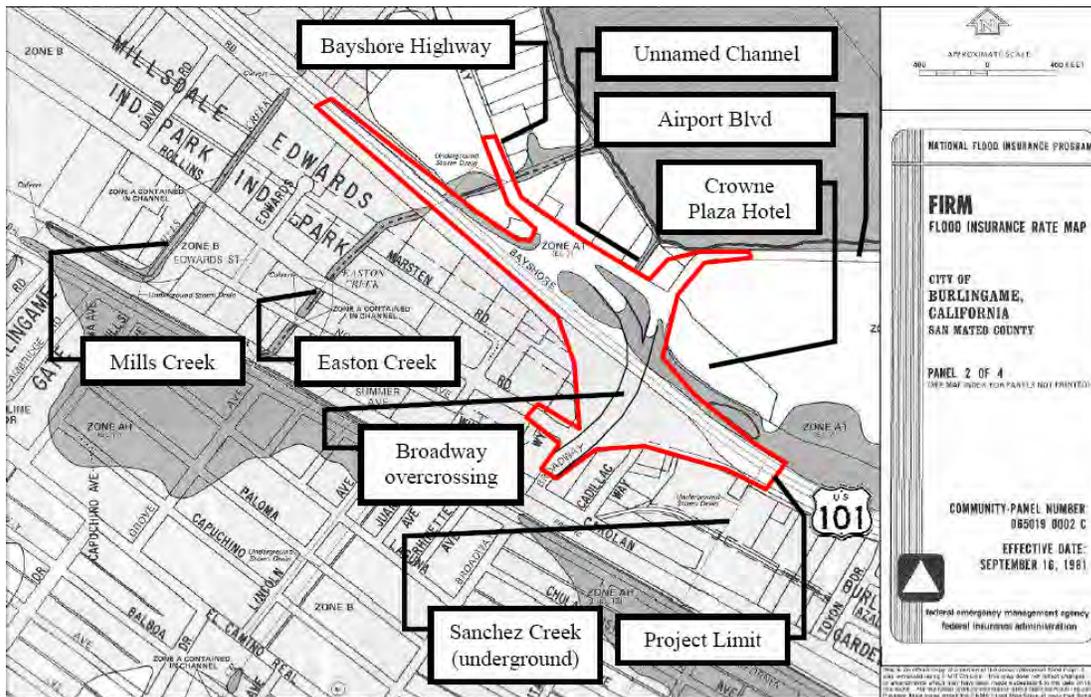


Figure 2.7-1 FEMA Flood Insurance Rate Map for Proposed Project Limits

Note: Shaded areas indicate extent of 100-year floodplain.

Based on a review of the FEMA FIRM and consultation with Department and City of Burlingame staff, high tides in San Francisco Bay cause flooding between the Crowne Plaza Hotel parking lot and the off-ramp from northbound US 101, and blockage of the unnamed channel causes flooding at the eastern landing of the

Broadway overcrossing. The blockage results from sediment accumulation where the pipe beneath Bayshore Highway outfalls at the bottom of the channel, and from the low berm that prevents water and sediment in the channel from flowing into the Bay.

A third location, the northbound US 101 on-ramp from Bayshore Highway, has also historically experienced flooding from Easton Creek. The City of Burlingame is completing a project designed to decrease creek flows and eliminate local flooding from Easton Creek (discussed further in Section 2.19.3.5).

2.7.3. Environmental Consequences

2.7.3.1. Longitudinal Encroachment

As defined by FHWA, a longitudinal encroachment is an action within the limits of the base floodplain that is longitudinal to the normal direction of the floodplain. All project features would be perpendicular to the direction of flow of the creeks in the project area. The Broadway overcrossing would be elevated and replace an existing overcrossing structure. As the project would not cause longitudinal encroachments into the base floodplain, no alternatives to avoid longitudinal encroachments were considered.

2.7.3.2. Risks of the Action

The project would not affect Easton Creek west of US 101, Sanchez Creek, Mills Creek, or the Burlingame Lagoon. The project would affect Easton Creek on the east side of US 101, the unnamed channel, and the floodplain between the existing US 101 off-ramp and the Crowne Plaza Hotel parking lot.

The existing 6-by-6-foot double box culvert at Easton Creek on the east side of US 101 would be extended by approximately 42 feet to the east to accommodate the construction of the new northbound US 101 on-ramp. The culvert extension would require minor fill in the floodplain of Easton Creek. Independent of the proposed project, the City of Burlingame is implementing improvements to address flooding in Easton Creek. With these improvements in place, fill from the proposed project would not affect the extent or elevation of flooding in the vicinity of Easton Creek.

The project would implement one or more drainage modifications to eliminate flooding around the eastern landing of the Broadway overcrossing. One option is to restore the conveyance capacity of the unnamed drainage channel by cleaning the 24-inch culvert pipe that drains to the channel and determining if it has sufficient capacity to convey runoff. This option could also involve removing sediments from

the channel to increase its capacity and removing the berm across the channel to allow flows to drain to the Bay. Another option is to install a new storm drainage system to collect runoff from the eastern landing of the Broadway overcrossing and Bayshore Highway and to convey the runoff by gravity flow to an existing outfall at Easton Creek. The drainage modifications required to address the flooding will be developed during final design.

The project would also place fill in the floodplain between the existing southbound US 101 off-ramp and the Crowne Plaza Hotel parking lot. The fill would not affect the extent or elevation of flooding because the water volume that would be displaced is insignificant compared to the source of the flood flow, which is San Francisco Bay.

Under the No Build Alternative, flooding at the eastern landing of the Broadway overcrossing could continue unless the City of Burlingame implements future drainage modifications in that area.

The proposed project would not create flooding that could disrupt a transportation facility needed for emergency access or create a significant risk to life or property as a result of floodplain encroachment. The project would not result in a significant floodplain encroachment.

2.7.3.3. Natural and Beneficial Floodplain Values

The project area provides natural and beneficial floodplain values to fish, wildlife, and water quality. The project would implement construction best management practices (BMPs) to minimize impacts to water bodies. No special mitigation measures are necessary to minimize impacts or restore and preserve natural and beneficial floodplain values.

2.7.3.4. Incompatible Floodplain Development

The proposed project would not support incompatible floodplain development because it would not provide access to any areas that are not already served by the interchange.

2.7.4. Avoidance, Minimization, and/or Mitigation Measures

The proposed project has been designed to avoid and minimize encroachments and impacts to the maximum extent practicable. With implementation of the avoidance and minimization measures described in Sections 2.8.4 and 2.14.4.1, the project would avoid impacts on natural and beneficial floodplain values. Measures to address

the increase in impervious surfaces that would result from the project are described in Section 2.8.4. No additional avoidance, minimization, and/or mitigation measures are required.

2.8. Water Quality and Storm Water Runoff

This section is based on the *Water Quality Study* (WRECO 2010) for the proposed project, which was completed in July 2009. Hydrology and floodplains are discussed in Section 2.7.

2.8.1. Regulatory Setting

2.8.1.1. Federal Requirements: Clean Water Act

In 1972, the Federal Water Pollution Control Act was amended, making the discharge of pollutants to the waters of the United States from any point source unlawful, unless the discharge is in compliance with a NPDES permit. The Federal Water Pollution Control Act was subsequently amended in 1977 and was renamed the Clean Water Act (CWA). The CWA, as amended in 1987, directed that storm water discharges are point source discharges. The 1987 CWA amendment established a framework for regulating municipal and industrial storm water discharges under the NPDES program. Important CWA sections are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for any federal project that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the State that the discharge will comply with other provisions of the act.
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) into waters of the United States. Regional Water Quality Control Boards (RWQCBs) administer this permitting program in California. Section 402(p) addresses storm water and non-storm water discharges.
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the USACE.

The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

2.8.1.2. State Requirements: Porter-Cologne Water Quality Control Act (California Water Code)

California’s Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a “Report of Waste Discharge” for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives) required by the CWA, and regulating discharges to ensure that the objectives are met. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. States designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, each state identifies waters failing to meet standards for specific pollutants, which are state listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source controls, the CWA requires establishing Total Maximum Daily Loads (TMDLs). TMDLs establish allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

- **NPDES Program**

The SWRCB adopted Caltrans Statewide NPDES Permit (Order No. 99-06-DWQ) on July 15, 1999. This permit covers all Department rights-of-way, properties, facilities, and activities in the State. NPDES permits establish a 5-year permitting time frame. NPDES permit requirements remain active until a new permit has been adopted.

In compliance with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the 2003 SWMP to address storm water runoff or any subsequent SWMP version draft and approved.

- **Municipal Separate Storm Sewer System Program**

The U.S. Environmental Protection Agency (USEPA) defines a Municipal Separate Storm Sewer System (MS4) as any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, country, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water. As part of the NPDES program, the USEPA initiated a program requiring that entities having MS4s apply to their local RWQCBs for storm water discharge permits. The program proceeded through two phases. Under Phase I, the program initiated permit requirements for designated municipalities with populations of 100,000 or greater. Phase II expanded the program to municipalities with populations less than 100,000.

- **Construction Activity Permitting**

Section H.2, Construction Program Management of the Department's NPDES permit states: "The Construction Management Program shall be in compliance with requirement of the NPDES General Permit for Construction Activities (Construction General Permit)". Construction General Permit (Order No. 2009-009-DWQ, adopted on September 2, 2009, became effective on July 1, 2010. The permit will regulate storm water discharges from construction sites that result in a disturbed soil area (DSA) of 1 acre or greater, and/or are part of a common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 1 acre must comply with the provisions of the General Construction Permit.

The newly adopted permit separates projects into Risk Levels 1 – 3. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring. Risk levels are determined during the design phase and are based on potential erosion and transport to receiving waters. Applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP).

The Caltrans Statewide NPDES Permit requires the Department to submit a Notice of Construction (NOC) to the RWQCB to obtain coverage under the Construction General Permit. Upon project completion, a Notice of Completion of Construction (NOCC) is required to suspend coverage. This process will continue to apply to Department projects until a new Caltrans Statewide NPDES Permit is adopted by the SWRCB. An NOC or equivalent form will be submitted to the RWQCB at least 30 days prior to construction if the associated DSA is 1 acre or more. In accordance with the Department’s Standard Specifications, a Water Pollution Control Plan (WPCP) is used for projects with DSA less than 1-acre.

During the construction phase, compliance with the permit and the Department’s Standard Special Conditions requires appropriate selection and deployment of both structural and nonstructural BMPs. These BMPs must achieve performance standards of Best Available Technology economically achievable/Best Conventional Pollutant Control Technology to reduce or eliminate storm water pollution.

2.8.1.3. Local Requirements

The San Francisco Bay RWQCB has issued the San Mateo Countywide Storm Water Pollution Prevention Program NPDES Permit for projects and facilities within the County of San Mateo.

The San Mateo County General Plan (1986, elements amended various years), the City General Plan (City of Burlingame 1969, elements amended various years), and the Bayfront Plan (City of Burlingame 2006) include policies, procedures, and actions that provide development guidance specific to water resources. These include erosion control measures for construction, grading, and filling—especially near watercourses—to minimize impacts from erosion and sedimentation.

2.8.2. Affected Environment

2.8.2.1. Surface Water Resources

As described in Section 2.7.2, surface water in the project limits consists of Easton Creek, Sanchez Creek, and an unnamed channel at Bayshore Highway near Airport Boulevard. Mills Creek and the Burlingame Lagoon are nearby but outside of the project limits (Figure 1-1).

Water flows in the general area are highly seasonal; more than 90 percent of annual runoff occurs during the winter rainy season. Within the project vicinity, drainage is primarily by sheet flow east toward the Bay, or through the local drainage systems and creeks. Sanchez Creek, Easton Creek, and the Burlingame Lagoon are all classified as waters of the United States and/or waters of the State. Potentially jurisdictional waters in the project area are discussed in Section 2.14.

Water Supply

The City of Burlingame receives its drinking water from connections to the City of San Francisco's Crystal Springs and Sunset Aqueducts. Groundwater and surface water in the project area are not used as sources of municipal water supply.

Existing Surface Water Quality

TMDL requirements limit the amount of a given pollutant that a water body can receive without violating water quality standards and designated uses. None of the surface waters in the project limits are in the SWRCB's list of waterways that do not meet water quality standards, known as the CWA Section 303(d) List of Water Quality Limited Segments, or the 303(d) List. All of the waterways, however, drain to San Francisco Bay, which is on the 303(d) List. TMDLs have been established for chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, dioxin compounds, exotic species, furan compounds, mercury, and polychlorinated biphenyls (PCBs) in San Francisco Bay.

2.8.2.2. Groundwater Resources

The proposed project is located within the Westside Groundwater Basin of the San Francisco Bay Hydraulic Region. Sources of recharge include rainfall, irrigation water infiltration, and leakage from water and sewer pipes. Groundwater has been encountered at a shallow depth of approximately 4 feet. Numerous wells are in the area. Samples from approximately 40 percent of the wells documented bicarbonate waters, and nitrate-nitrogen concentrations commonly exceeded USEPA guidelines.

Past releases of fuels, solvents, and other contaminants to groundwater have been recorded for facilities in the project area (see Section 2.10.2).

2.8.3. Environmental Consequences

2.8.3.1. Short-Term (Construction) Impacts

Project construction would have the potential to result in temporary impacts to water quality and storm water runoff from increased erosion and subsequent transport of sediment to surface waters. Soil erosion could increase the amount of suspended and dissolved solids, and pollutants in the storm water generated from construction activities such as excavation, materials stockpiling (e.g., soil, gravel), utility relocation, construction of new roadway/structures, paving and milling, and concrete curing.

Spills and fluid leaks from construction vehicles, equipment, or materials may also occur during construction. If such materials were to enter waterways or adversely affect vegetation or wildlife habitat, water quality may be adversely affected. The magnitude of such an impact would depend on the amount and type of material released.

Because of the relatively shallow depth of groundwater in the project area (4 feet below existing grade), releases and spills may impact groundwater quality. Groundwater would likely be encountered during construction. Preliminary design indicates that activities such as installation of retaining walls and concrete barrier footings would require excavation or disturbance to a depth of 4 feet; however, construction of the Broadway overpass girder structure and pile footings would be anticipated to require deeper ground disturbance. Dewatering is anticipated to be required for the installation of the overcrossing and the extension of the Easton Creek culvert. A dewatering permit from the RWQCB may be required for any dewatering or excavation below the groundwater depth.

2.8.3.2. Long-Term (Permanent) Impacts

The existing box culvert in Easton Creek would be extended to accommodate the proposed northbound on-ramp. Although the extension would place fill in the creek, permanent impacts from the extension are anticipated to be minimal. Easton Creek flows are conveyed in a concrete-lined channel downstream of the proposed culvert extension. The culvert extension is not anticipated to permanently increase flow velocity.

In general, heavy metals associated with vehicle tire and brake wear, oil, grease, and exhaust emissions are the primary toxic pollutants associated with transportation corridors. Although the project would not result in an overall increase in traffic

volumes, it would create 0.5 acre of new impervious area, which would increase the volume and velocity of storm water flow to downstream waterways. However, this additional impervious area would be insignificant relative to the overall watershed area.

Increases in the rate of storm water discharges to waterways can result in changes in erosion known as hydromodification. According to the San Mateo Countywide Storm Water Pollution Prevention Program *Hydromodification Management Plan* (STOPPP 2005), the project would be exempt from hydromodification requirements because it falls within two exempt zones (a low gradient zone and a hardened channel zone).

No permanent impacts to groundwater would result from the proposed project (WRECO 2010). The proposed project is anticipated to have a minimal permanent impact to storm water runoff and water quality.

2.8.4. Avoidance, Minimization, and/or Mitigation Measures

Disturbed soil areas would be minimized, and existing vegetation would be maintained to the maximum extent practicable. Work during the rainy season would be limited to the extent practicable to avoid impacts to storm water runoff. Surface waters within the project limits are classified as waters of the U.S. and/or waters of the State; therefore, concurrence and/or permits from the USACE, CDFG, and RWQCB would be required prior to construction (see Section 2.14). These concurrences and permits may require implementation of temporary and permanent BMPs, mitigation, and restoration efforts. Because the project occurs within 100 feet of the San Francisco Bay shoreline, a BCDC consistency determination may also be required prior to construction.

In addition to the measures discussed above, the Department has been issued a Statewide NPDES permit for construction activities, and each project must comply with the conditions of that permit. A SWPPP is required for this project. The SWPPP would include storm water BMPs applicable to construction of the proposed project. These BMPs are expected to include measures for temporary soil stabilization and sediment control. Additionally, permanent erosion control BMPs would be addressed as part of the project design process. The statewide Caltrans SWMP identified short-term (construction) and long-term (permanent) BMPs, which were reviewed for the preliminary recommendation of project specific measures summarized in the follow subsections. BMPs fall into four categories: Design Pollution Prevention, Treatment, Construction Site, and Maintenance.

2.8.4.1. Short-Term (Construction) BMPs

Earth-moving activities are anticipated to be necessary during construction. Stabilized construction entrances/exits would be used to prevent the tracking of mud and dirt off-site. Temporary BMPs would be implemented during project construction to comply with the NPDES conditions and would meet Caltrans Best Available Technology/Best Conventional Technology for construction projects. Compliance with the NPDES conditions and adherence to the City of Burlingame and San Mateo County requirements would reduce or eliminate potentially adverse construction-related effects. The most effective BMPs that can be used to minimize erosion include:

- Preserving existing vegetation;
- Avoiding or minimizing work during the rainy season and during any rainfall events or immediately following precipitation when the ground surface is wet;
- Limiting the amount and length of exposure of graded soil and soil stockpiles; and
- Protecting exposed spoils through the use of mulches or erosion control blankets/mats.

Approved erosion control BMPs are described in the *Caltrans Construction Site Best Management Practices Manual* (Department 2003). Temporary erosion control and water quality measures would be defined in detail in the project SWPPP and designated as line items in the plans, specifications, and estimates (PS&Es). Table 2.8-1 lists the minimum requirements to be implemented during project construction.

Table 2.8-1 Minimum Requirements for Temporary BMPs

Category	Minimum Requirement(s)
Soil Stabilization Practices	Preservation of Existing Vegetation Temporary Fence (Type ESA) Hydraulic Mulch
Sediment Control Practices	Silt Fence Fiber Rolls Storm Drain Inlet Protection Sediment/Desilting Basin Sediment Trap
Tracking Control	Stabilized Construction Entrance/Exit Street Sweeping and Vacuuming
Wind Erosion Control	Wind Erosion Control

Table 2.8-1 Minimum Requirements for Temporary BMPs

Category	Minimum Requirement(s)
Non-Storm Water Control	Dewatering Paving and Grinding Operations Illicit Connection/Illegal Discharge Detection and Reporting Vehicle and Equipment Cleaning, Fueling, and Maintenance Pile Driving Operations Concrete Curing and Finishing Material and Equipment Use Over Water Structure Demolition/Removal Over or Adjacent to Water
Waste Management & Materials Pollution Control	Concrete Waste Management Material Delivery and Storage Material Use Solid Waste Management Spill Prevention and Control Sanitary/Septic Waste Management Stockpile Management

Source: Department 2003

2.8.4.2. Long-Term (Permanent) BMPs

Permanent (post-construction) BMPs include the minimization of land disturbance and impervious surfaces, treatment of runoff, and energy dissipation devices.

Permanent BMPs included with the project would reduce the suspended particulate loads (and thus pollutants associated with the particulates) entering waterways after construction is completed. This category of water quality control measures can be identified as including both Design Pollution Prevention BMPs and Treatment BMPs.

The proposed project would not be required to consider permanent treatment BMPs within the Department's right-of-way because the project would result in less than 1 acre of net increase in impervious area or rework of existing impervious area.

However, the project would be required to consider storm water treatment in accordance with County of San Mateo requirements, as the project would result in the net increase or rework of more than 10,000 square feet of impervious area.

2.8.4.3. BMPs Considered Feasible

Treatment of storm water runoff for the proposed project would be implemented to the Maximum Extent Practicable. However, the project is located in a developed area with existing constraints that limit the extent and location of treatment BMPs. The following treatment BMPs are considered the most feasible for the proposed project:

- Vegetated swales and buffer strips; and
- Tree well filters.

2.9. Geology, Soils, and Seismicity

This section is a brief summary of the geotechnical assessments performed for the proposed project. A *Geotechnical Impact Report* completed in May 2009 summarizes the initial assessment of geologic conditions in the project area and potential impacts (URS 2009d). Preliminary foundation reports completed in July 2009 address subsurface conditions at the overcrossing and proposed retaining wall locations (URS 2009e and f).

2.9.1. Regulatory Setting

For geologic and topographic features, the key Federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects “outstanding examples of major geological features.” Topographic and geologic features are also protected under CEQA.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. The Department’s Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. The current policy is to use the anticipated Maximum Credible Earthquake (MCE), from young faults in and near California. The MCE is defined as the largest earthquake that can be expected to occur on a fault over a particular period of time.

2.9.2. Affected Environment

2.9.2.1. Site Geology

The US 101/Broadway interchange is located on the western margin of the San Francisco Bay block within the central portion of the Coast Ranges geomorphic province of California. Northwest-to-southeast-trending valleys and ridges characterize the regional morphology of the Coast Ranges province. These topographic features are controlled by folds and faults that resulted from the collision of the Farallon and North American plates and subsequent strike-slip faulting along the San Andreas fault system. The San Francisco Bay block is a relatively stable seismic block bordered by the San Andreas and Hayward faults to the west and east, respectively.

The project site is located just east and northeast of the historic San Francisco Bay margin and has various surface and subsurface geologic and soil conditions. The former tidal flats have been covered with artificial fill that overlays the majority of

the project area, from about Rollins Road to the edge of the Bay. Artificial fill has been placed in areas of estuarine deposits. Alluvial fan deposits consisting of sand, silt, clayey silt, and gravel are south and southwest of Rollins Road. The depth to bedrock in the project area is unknown but is estimated to range from 150 to 200 feet.

Geotechnical borings performed in 1970 and 2002 for the improvements to the Broadway overcrossing and pedestrian overcrossing indicate a subsurface alluvial soil profile consisting of 3 to 10 feet of fill underlain by Bay Mud and alluvium. The fill consists of silty to clayey sand and lean clay with gravel. The thickness of the Bay Mud ranged from about 2 feet to as much as 14 feet and consisted of soft to very soft, dark gray to black organic clay with peat layers and occasional shells and thin sand interbeds. Alluvium underlying the Bay Mud consists of complexly interbedded medium dense to dense silty to clayey sand and silt and soft to very stiff clay. Fine to medium gravel interbeds were also common throughout the alluvium. Due to the proximity to the Bay, groundwater is expected to be at or near the surface and may be subject to tidal fluctuations and surface runoff.

2.9.2.2. Geologic Hazards

As the project area is on relatively flat ground, landsliding would not present a hazard. Subsidence from groundwater or petroleum extraction is not known to occur in the project area. Potential geologic hazards in the project area are described below.

Surface Fault Rupture

The US 101/Broadway interchange is about 2.5 miles east of the San Andreas fault, which has an MCE magnitude of 8.0 (Mualchin 1996). Other faults near the project area include the San Gregorio-Palo Colorado fault (9.5 miles southwest), the Hayward fault (16 miles northeast), and the west branch of the Monte Vista fault (14 miles southeast). The project area is not in the vicinity of any Alquist-Priolo Earthquake Fault Zones and does not cross any mapped faults. Surface rupture of the project area due to faulting is not expected to occur.

Earthquake Shaking

The short distance to the San Andreas fault and other active faults creates a high risk for ground shaking from fault movement. The San Andreas fault is the largest active fault in California and is responsible for the largest known earthquake in Northern California, the 1906 moment magnitude¹⁰ (M) 7.9 San Francisco earthquake (Wallace

¹⁰ Moment magnitude is a measure of the total amount of energy of an earthquake, considering (among other factors) the area of a fault's rupture surface and the distance the earth moves along the fault. Each

1990). In the Bay Area, the main trace of the San Andreas fault forms a linear depression along the Peninsula, occupied by the Crystal Springs and San Andreas Lake reservoirs. In the project area, the fault would have a peak bedrock acceleration of 0.6 g.¹¹

Liquefaction and Lateral Spreading

Liquefaction is a phenomenon whereby sediments temporarily lose shear strength and collapse. The soil type most susceptible to liquefaction is loose, cohesionless, granular soil below the water table and within about 50 feet of the ground surface. Lateral spreading occurs when a layer liquefies at depth and causes horizontal movement or displacement of the overburden mass toward a free face such as a stream bank or excavation, or toward an open body of water.

U.S. Geological Survey (USGS) and ABAG maps show the project area as having “very high” liquefaction susceptibility (Witter et al. 2006; ABAG 2004). Borings completed in the project area indicate that the fill soils consist of silty to clayey sand and lean clay. The underlying Bay mud is generally clayey and not subject to liquefaction but contains occasional loose to medium dense silty sand layers. The underlying Holocene alluvium also contains silty sand interbeds. Since these granular sediments are generally below the groundwater and could be loose, they may be subject to liquefaction and associated ground surface settlement. The potential for lateral spreading at this site appears to be low.

Settlement

Settlement can occur when soil is loaded by a structure or by the placement of fill on top of soil; when soil pore pressures gradually dissipate from vertical loading; and from earthquake shaking (known in this case as compaction settlement). The clayey fill soils and Bay mud found in the project area range from very soft to stiff and are subject to settlement due to loading.

Corrosion

According to the geotechnical investigation for the pedestrian overcrossing (Parikh Consultants 2005), soils in the project area are corrosive, and groundwater contains chlorinated solvents that could corrode metal pipes.

whole-number increase (e.g., 4.8 to 5.8 to 6.8) represents a tenfold increase in the size of the ground motion.

¹¹ g = Acceleration due to earth’s gravity, a measure of how hard the ground shakes in a specific geographical area. 0.6 g would be associated with a severe earthquake.

2.9.3. Environmental Consequences

The project area is not in the vicinity of any Alquist-Priolo Earthquake Fault Zones and does not cross any mapped faults. The proposed project would not expose people or structures to potential substantial adverse effects from fault rupture.

The proposed project is in a seismically active area and has a reasonably high potential to experience strong earthquake shaking in the future. The potential exists for people or structures to be exposed to substantial adverse effects from seismic ground shaking. This risk is also present with the existing condition and the No Build Alternative.

Borings conducted in the project area identified soils that may be subject to liquefaction and associated ground surface settlement and could affect the proposed overcrossing's abutment foundations and roadway. At the abutments of the proposed Broadway overcrossing, approach embankments with retaining walls up to 25 feet high would be constructed to accommodate the increased overcrossing height. Due to the presence of fill soils underlain by Bay mud and alluvium, these areas could experience consolidation settlement of up to 13 inches.

2.9.4. Avoidance, Minimization, and/or Mitigation Measures

Additional geotechnical subsurface and design investigations will be performed during the final design and engineering phase for the project. The investigations will include site-specific evaluation of subsurface conditions at the locations of proposed foundation features during final design. Project elements will be designed and constructed to meet seismic design requirements for ground shaking and ground motions, as determined for the project location and site conditions (liquefaction, settlement, and corrosion). No further avoidance, minimization, and/or mitigation is needed.

2.10. Hazardous Waste and Materials

The following discussion is based on the *Initial Site Assessment* (URS 2009g) for the proposed project, which was completed in May 2009.

2.10.1. Regulatory Setting

Hazardous materials and hazardous wastes are regulated by many State and Federal laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health and land use.

The primary Federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for “cradle to grave” regulation of hazardous wastes. Other Federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when Federal activities or Federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of the Federal RCRA and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during project construction.

2.10.2. Affected Environment

The *Initial Site Assessment* (URS 2009g) for the proposed project included the following:

- An Environmental Data Resources, Inc. (EDR) environmental information database search for the project limits and surrounding areas within approximately 1 mile;

- A review of the project plans, historical aerial photographs, topographic maps, and Sanborn® maps (historical fire insurance maps) covering the project limits and adjacent areas;
- A site and adjacent area field review of the existing and proposed right-of-way and adjoining properties; and
- A review of available files at the San Mateo County Environmental Health Department and the Central County Fire Department to obtain additional information on sites identified in the EDR search.

The assessment did not include soil or groundwater sampling or sampling for asbestos, radon, lead-based paint, or lead in drinking water.

2.10.3. Environmental Consequences

The assessment identified 15 potential hazardous materials sites within the existing or proposed State right-of-way. These sites include gas stations, auto repair facilities, and industrial and commercial properties. Based on a review of existing data, additional investigation is recommended at 10 of these properties. Ten other potential hazardous materials sites have been reported outside, but within 1 mile, of the project limits. Additional investigation is recommended for one of these sites that is upgradient from, and outside of, the project limits and may have affected subsurface conditions within the proposed construction area. The 11 sites for which additional investigation is recommended are described in Table 2.10-1.

Six additional sites within 1 mile of the project limits were identified as warranting further evaluation only if the project limits change and additional right-of-way is required within 100 feet of these sites. These sites include three gas stations, a commercial facility, an auto repair facility, and a solid waste landfill.

Corrective actions have been conducted or are ongoing at most of the hazardous materials sites identified within or adjacent to the project limits, and natural remediation and composition of hydrocarbon and other contaminants may have occurred since previous remediation actions. However, the risk of encountering contamination from these sites during project construction, or of acquiring properties with continued contamination, remains medium to high.

Table 2.10-1 Potential Hazardous Materials Sites

Owner or Occupant/ Address	Description	Further Investigation Recommended
<i>In the Proposed Right-of-Way</i>		
City of Burlingame Drainage Easement, Bayshore Highway	A retaining wall would be built along the Bayshore Highway side of the parcel. Spills in the vicinity would flow to this drainage. This property is adjacent to US 101 and therefore may contain aerially deposited lead (ADL).	Develop work plan, including soil sampling, to investigate for potential petroleum hydrocarbons and ADL.
76 Conoco Phillips, 1200 Bayshore Highway	Full acquisition of the parcel is proposed for the realigned Bayshore Highway /Broadway/Airport Blvd. intersection. The gas station was listed in the CORTESE database and several leaking underground storage tank (UST)-related databases. After a waste oil UST was removed in 1988, monitoring wells were installed at the property to evaluate groundwater quality. Groundwater monitoring was conducted from 1989–1996, 1999–2001, and 2003–present. Risk assessments and corrective actions were also conducted at the property from 1990–1995 and in 2003. A risk-based case closure was requested in 2004. Petroleum hydrocarbons above regulatory limits were detected in groundwater in 2005 and as free phase in one monitoring well in 2007. Previous investigations identified petroleum hydrocarbons in groundwater.	Develop work plan, including soil and groundwater sampling, to investigate for potential releases of petroleum hydrocarbons.
Various: Office Building, 1299 Bayshore Highway	The widened Bayshore Highway and realigned northbound US 101 on-ramp would traverse the southern half of the parcel. A non-PCB-containing transformer, meter, and a sewer discharge monitoring station are on the west side of the property. This property is adjacent to US 101 and therefore may contain ADL.	Develop work plan, including soil sampling, to investigate for ADL.
Unknown, 1322 Marsten Road	The proposed southbound US 101 off-ramp would cross the easternmost edge of the property, a retaining wall is proposed along the new off-ramp lanes. This property is listed in the HAZNET database as City of Burlingame Garage and is reported to generate small quantities of hazardous waste. No violations were found. This property is adjacent to US 101 and therefore may contain ADL.	Develop work plan, including soil sampling, to investigate for ADL.
Western Exterminator and Nerli Construction, 1320 Marsten Road	The proposed southbound US 101 off-ramp would cross the easternmost edge of the property; a retaining wall would be constructed along the new off-ramp lanes. UST leaks and petroleum hydrocarbon-impacted soils were reported from 1991–1994. Subsurface investigations, corrective actions, and groundwater monitoring were subsequently conducted. Although petroleum hydrocarbons at concentrations above regulatory limits remain underneath the property, a risk-based case closure was requested and granted in 2000. Because the closure may not apply or absolve the Department of future costs, additional investigation may be warranted.	Develop work plan, including soil and groundwater sampling, to investigate for petroleum hydrocarbons and ADL.
Hanson Autobody Auto Repair, 1222 Rollins Road	The proposed project includes construction of a retaining wall along the new southbound US 101 off-ramp lanes at the easternmost end of the property. The facility is listed in the CORTESE database because of solvents in groundwater. Several minor issues related to deficient hazardous substances storage, hazardous waste management, previous use as a paint booth, and poor housekeeping were documented from 1971–2007. Previous investigations concluded that groundwater north of the site is impacted with petroleum hydrocarbons; groundwater investigation north of the property was recommended. This property is adjacent to US 101 and therefore may contain ADL.	Develop work plan, including soil and groundwater sampling, to investigate for solvents, petroleum hydrocarbons, and for ADL.

Table 2.10-1 Potential Hazardous Materials Sites

Owner or Occupant/ Address	Description	Further Investigation Recommended
Hanson Autobody Auto Repair, 1244 Rollins Road	The proposed project would construct a retaining wall along the new southbound US 101 off-ramp at the eastern end of the property. Previous investigations concluded that groundwater north of the site is impacted with petroleum hydrocarbons and recommended additional investigation north of the property. Tire and petroleum hydrocarbons were observed stored at the site. The 1959 Sanborn Map indicated an aboveground oil-storage tank at this property. This property is adjacent to US 101 and may contain ADL.	Develop work plan, including soil and groundwater sampling, to investigate for petroleum hydrocarbons and for ADL.
Autohaus Schmid, 1213 Rollins Road	The project would widen Rollins Road into the east (front) side of this property, and retaining walls may be constructed along the driveways. A leak from an on-site UST was reported in 1999. Although a cleanup was completed and the case closed in 2001, subsequent investigations reported petroleum hydrocarbons in the groundwater and recommended further investigation for presence of solvents and petroleum hydrocarbons.	Develop work plan, including soil and groundwater sampling, to investigate for petroleum hydrocarbons and solvents.
ARCO, 1000 Broadway	The project would widen Rollins Road into the east (front) side of this property, and retaining walls may be constructed along the driveways. The gas station has been listed as a Leaking Underground Storage Tank (LUST) cleanup facility. A gasoline leak was reported in 1985, but the case was closed in 1994. A new gasoline leak was reported in 2001. Subsurface investigations, remedial actions, and groundwater monitoring were performed at the property until at least 2009 (Stantec 2009). The case is open.	Develop work plan, including soil and groundwater sampling, to investigate for petroleum hydrocarbons.
Mike Harvey Honda, 1041 and 1049 Broadway	The project may require a temporary construction easement at this property. The facility is listed in CORTESE and UST-related databases. A leak was reported in 1991 during a UST removal at the property. Subsurface investigations, remedial actions, and groundwater monitoring were performed at the property until 1992, when the monitoring program was finalized due to decreasing petroleum hydrocarbons concentrations in the groundwater. Follow-up surveys revealed the presence of subsurface chlorinated compounds. Analytical data from 1996 documented chlorinated compounds in the groundwater and are believed to have originated upgradient from off-site. The case was closed in 1997. Because the closure may not apply or absolve the Department of future costs, additional investigation may be warranted.	Develop work plan, including soil and groundwater sampling, to investigate for chlorinated solvents. Sampling may not be required if this area is only used as a TCE; however, samples should be collected downgradient of this property within the project area.
Outside of the Proposed Right-of-Way		
76 Conoco Phillips, 1147 Rollins Road	The property is across the street (to the west and upgradient) from the existing southbound ramps to/from Rollins Road, which would be closed and the pavement removed as part of the project. Outside shoulder widening would take place on the east side of Rollins Road, and the street would be regraded to conform to the higher elevation of the nearby Broadway intersection. The property is listed as a LUST facility, cleanup site, and case open-site assessment. Several fuel and waste oil leaks were reported to have impacted soil and groundwater underneath the property from 1991–2002, during UST removal activities. Subsurface investigations, corrective actions, and groundwater monitoring were conducted at the property. Information from 2008 reveals the presence of petroleum hydrocarbons in groundwater above regulatory limits underneath the property (with the highest concentrations at the northwest corner) and outside the footprint of the gas station. Previous investigations concluded that the groundwater under the southern part of the proposed interchange is likely impacted with petroleum hydrocarbons from UST releases at 1000 Broadway, 1147 Rollins Road, and 1213 Rollins Road.	If right-of-way acquisition or dewatering is planned downgradient of this property, develop work plan to collect groundwater samples to evaluate whether the known releases would affect project construction activities.

In addition to the facilities and sites listed above, demolition or construction activities could increase risk of exposure to airborne contaminants from materials in roadway structures, building, and surface soils. Thermoplastic paint used for roadway striping in the project limits and paint on structures that would be demolished as part of the project may contain lead. Asbestos-containing materials may be present in concrete, pipes, electrical insulation, and other features of structures that would be demolished as part of the project. Vehicle tire and brake wear, oil, grease, and exhaust from vehicular traffic on US 101, Broadway, Bayshore Highway, and other roads within the project limits may have contaminated surface soils in the immediate vicinity with aerially deposited lead (ADL) and other heavy metals. Exposure to airborne contaminants from these materials could affect safety and health.

Gasoline, diesel fuel, oil, and lubricants for construction equipment are typically used, handled, and stored by contractors on roadway construction projects. In all construction projects, there is a potential for the accidental release of fuels or lubricants from construction equipment or vehicles. No specific risks related to such a release have been identified for the proposed project. Contractors are required to handle hazardous materials in accordance with applicable laws, including health and safety requirements. No acutely hazardous materials would be used or stored within the project limits during project construction.

The project would not create a significant new hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. The project would not expose an existing or proposed school within 0.25 mile to risks associated with hazardous materials, as the nearest school is approximately 1 mile away. Project construction would require temporary closures and/or detours of interchange ramps and portions of surface streets but would maintain access across US 101; therefore, substantial impacts to emergency response or evacuation would be avoided.

CEQA requires evaluation of safety hazards resulting from projects within an airport land use plan, within 2 miles of a public airport, or in the vicinity of a private airstrip. The project limits are less than 2 miles from SFO, and the area between the northern project limits and roughly 500 feet south of Easton Creek within the project area is within the Airport Influence Area for SFO (City of Burlingame 2007). The project would replace an existing interchange and would not result in a safety hazard due to its proximity to an airport.

2.10.4. Avoidance, Minimization, and/or Mitigation Measures

Further investigation of the sites identified in Table 2.10-1 is recommended due to the potential presence of petroleum hydrocarbons, solvents, and ADL in soil and/or groundwater. The following measures would be included in the project to identify the presence and extent of potential hazardous materials.

- For project excavations that extend to groundwater, groundwater sampling, analysis, and characterization would take place before construction commences. Treatment and disposal options for extracted groundwater should be determined before dewatering.
- If soil excavation is planned near properties where petroleum hydrocarbon-impacted soils may be present, the soil should be sampled, tested, and characterized.
- If soil excavation is planned near properties where chlorinated compounds may be present, the soil and groundwater should be sampled, tested, and characterized for chlorinated compounds.
- During final design, surface soils should be tested for ADL and heavy metals. The results of the testing will be used to determine the soil management options and any special soils handling requirements for the construction contractor, including implementing a health and safety plan.
- Structures that will be removed or modified by the project should be tested for hazardous materials such as lead-based paint and asbestos by a qualified and licensed inspector.
- Contaminated soil, groundwater, and other hazardous materials should be properly characterized and disposed of at an appropriate facility per applicable regulations.

The costs for sampling, testing, special handling, and disposal of potentially hazardous materials are unknown at this stage of preliminary design and environmental review. It is estimated that costs could range from \$75,000 to \$100,000 or more depending on the number of samples collected, the laboratory analyses used, and quantity of material that requires special disposal. The costs for special handling, if required, of contaminated building materials from structures that have to be removed would be estimated during final design.

2.11. Air Quality

This section summarizes the Air Quality Impact Assessment (URS 2009h) and Mobile Source Air Toxics (URS 2009i) technical reports completed for the project in December 2009.

2.11.1. Regulatory Setting

The Clean Air Act as amended in 1990 is the Federal law that governs air quality. Its counterpart in California is the California Clean Air Act of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the Federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter, lead, and sulfur dioxide (SO₂).

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to State Implementation Plan (SIP) for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for CO, NO₂, O₃, and particulate matter. California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as the MTC for the Bay Area, and the appropriate Federal agencies, such as the FHWA, make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for CO and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. A “hot spot” analysis is a dispersion modeling analysis, using CALINE4, to predict a project’s potential for violating the NAAQS for CO. In the case of particulate matter, a “hot spot” analysis is qualitative. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

2.11.2. Affected Environment

The proposed project is located in the peninsula subregion, as defined by the Bay Area Air Quality Management District (BAAQMD; 1999). This climatological subregion stretches from San Francisco south to San Jose. Its eastern boundary is defined by San Francisco Bay and its western boundary by the coastal mountain range. In the project area, marine air traveling through the San Bruno gap in the mountain coastal range is a dominant weather factor. The prevailing winds for most of this subregion are from the west and range from 5 to 10 mph. Temperatures in this subregion have a narrow range due to moderating marine air. Temperatures in summer average in the mid 70s, with lows in the mid 50s. Winter highs are in the mid to high 50s, with lows in the low to mid 40s.

The air pollution potential is lowest for the parts of the subregion that are closest to the Bay, due largely to good ventilation and fewer pollutants from upwind sources. Light winds in the evenings and early mornings occasionally cause elevated pollutant levels. This subregion contains a variety of industrial air pollution sources, but traffic and congestion along US 101 are the major source of local air pollution. Table 2.11-1 shows the applicable standards and attainment status of criteria pollutants in the project area.

Table 2.11-1 State and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ¹		National Standards ²	
		Concentration	Attainment Status	Concentration ³	Attainment Status
Ozone (O ₃)	8 Hour	0.070 ppm (137 µg/m ³)	N ⁹	0.075 ppm (157 µg/m ³)	N ⁴
	1 Hour	0.09 ppm (180 µg/m ³)	N		See Footnote 5
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m ³)	A	9 ppm (10 mg/m ³)	A ⁶
	1 Hour	20 ppm (23 mg/m ³)	A	35 ppm (40 mg/m ³)	A
Nitrogen Dioxide (NO ₂)	1 Hour	0.18 ppm (338 µg/m ³)	A	100 ppb (see footnote 11) (188 µg/m ³)	NA
	Annual Arithmetic Mean	0.030 ppm (56 µg/m ³)	NA	0.053 ppm (100 µg/m ³)	A
Sulfur Dioxide (SO ₂)	24 Hour	0.04 ppm (105 µg/m ³)	A	0.14 ppm (365 µg/m ³)	A
	1 Hour	0.25 ppm (655 µg/m ³)	A	NA	NA
	Annual Arithmetic Mean	NA	NA	0.030 ppm (80 µg/m ³)	A
Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	20 µg/m ³	N ⁷	NA	NA
	24 Hour	50 µg/m ³	N	150 µg/m ³	U
Particulate Matter - Fine (PM _{2.5})	Annual Arithmetic Mean	12 µg/m ³	N ⁷	15 µg/m ³	A
	24 Hour	NA	NA	35 µg/m ³ See Footnote 10	N ¹⁰
Sulfates	24 Hour	25 µg/m ³	A	NA	NA
Lead	Calendar Quarter	NA	NA	1.5 µg/m ³	A
	30 Day Average	1.5 µg/m ³	A	NA	NA
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	U	NA	NA
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm (26 µg/m ³)	No information available	NA	NA
Visibility Reducing particles	8 Hour (10:00 to 18:00 PST)	See Footnote 8	U	NA	NA

Notes: A=Attainment, N=Nonattainment, U=Unclassified; mg/m³=milligrams per cubic meter; ppm=parts per million; µg/m³=micrograms per cubic meter, NA=Not Applicable, PST=Pacific Standard Time

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM₁₀, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM₁₀ annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the State standard.

2. National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM₁₀ standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m³. The 24-hour PM_{2.5} standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m³.

Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM₁₀ is met if the 3-year average falls below the standard at every site. The annual PM_{2.5} standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.

3. National air quality standards are set by USEPA at levels determined to be protective of public health with an adequate margin of safety.

4. In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard. USEPA lowered the national 8-hour ozone standard from 0.80 to 0.75 PPM (i.e. 75 ppb) effective May 27, 2008. USEPA will issue final designations based upon the new 0.75 ppm ozone standard by March 2010.

5. The national 1-hour ozone standard was revoked by USEPA on June 15, 2005.

6. In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.

7. In June 2002, CARB established new annual standards for PM_{2.5} and PM₁₀.

8. Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

9. The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.

10. USEPA lowered the 24-hour PM_{2.5} standard from 65 µg/m³ to 35 µg/m³ in 2006. USEPA issued attainment status designations for the 35 µg/m³ standard on December 22, 2008. USEPA has designated the Bay Area as nonattainment for the 35 µg/m³ PM_{2.5} standard. The USEPA designation will be effective 90 days after publication of the regulation in the Federal Register. President Obama has ordered a freeze on all pending Federal rules; therefore, the effective date of the designation is unknown at this time.

11. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100ppm (effective January 22, 2010).

Source: BAAQMD Air Quality Standards and Attainment Status, no date. URL: http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm. Accessed May 10, 2010.

2.11.3. Environmental Consequences

2.11.3.1. Permanent Impacts

Air quality issues relate to a range of different pollutants and their individual regulatory standards. The evaluation of air quality impacts addressed in this section focuses on the project's conformity with the regional air quality framework and the project's potential to result in an adverse impact to the region's compliance with the relevant standards.

State Implementation Plan Conformity

This project will involve Federal transportation funds; therefore, the transportation conformity regulation, referred to as the Transportation Conformity Rule, applies. A version of the USEPA's Transportation Conformity Rule has been incorporated into the Bay Area portion of the SIP. For the San Francisco Bay Area, each updated version of the RTP and TIP is evaluated in a regional conformity analysis by MTC, to support a request for approval by FHWA.

Project Design and Funding in RTP and TIP

The project is included in MTC's most recent RTP, *the Transportation 2035 Plan for the San Francisco Bay Area* (MTC 2009a). It is listed as RTP ID No. 21602, "Reconstruct U.S. 101/Broadway interchange." The project is also included in the 2009 TIP (MTC 2008; TIP ID No. SM-050028), as "Interchange; Reconstruct and reconfigure interchange. Replace existing bridge with a wider bridge structure." The following summarizes the regional transportation planning and conformity approvals related to this project.

MTC initiated its regional conformity analysis for the 2009 TIP in February 2008 with a consultation request to partner agencies, discussing the approach to the air quality assessment. The process included public consultation and was developed in compliance with FHWA regulations and guidance on financial constraint. MTC's evaluation for the 2009 TIP determined that the regional emissions analysis was below the applicable budgets in the SIP. The regional air quality evaluation for the 2009 TIP was submitted to FHWA and FTA in May 28, 2008. The evaluation used the latest available socioeconomic and land use forecasts from ABAG Projections 2005 and the latest MTC travel demand model (BAYCAST) (MTC 2008), which are less than 5 years old. As noted above, the 2009 TIP was approved by FHWA/FTA on November 17, 2008.

The proposed project will be funded and is in the *Transportation 2035 Plan for the San Francisco Bay Area 2009 Regional Transportation Plan* (page 116), which was found to conform by MTC on April 22, 2009, and FHWA and FTA adopted the air quality conformity finding on May 29, 2009. The project is also included in MTC's financially constrained 2009 Transportation Improvement Program, page 330. The MTC's 2009 Transportation Improvement Program was found to conform by FHWA and FTA on November 17, 2008. The design concept and scope of the proposed project is consistent with the project description in the 2009 RTP, the 2009 TIP and the assumptions in the MTC's regional emissions analysis.

The project is in conformity with the SIP and will not otherwise interfere with timely implementation of any Transportation Control Measures (TCM) in the applicable SIP.

Evaluation of Potential for Traffic-Related CO Impacts

Traffic-related CO effects were evaluated to determine whether the project would cause or contribute to any new localized CO violations. The CO impacts analysis followed the procedures in *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol; Garza, Graney, and Sperling 1998), using screening criteria for projects in attainment or unclassified areas. The analysis consisted of two steps: a screening step to determine whether the project would affect CO levels at nearby intersections based on changes in levels of service, and a more detailed analysis to determine whether project-related increases in traffic volumes would affect local CO levels.

According to the traffic analysis (URS 2010a), three intersections would have unacceptable future levels of service (LOS E and F) under the No Build Alternative: the Broadway/US 101 off-ramp/Rollins Road intersection (LOS E in the AM and LOS F in the PM); the Cadillac Way/Rollins Road intersection (LOS E in the PM); and the Cadillac Way/Carolan Avenue intersection (LOS F in the PM). The proposed project would improve operating conditions such that these and all other study area intersections would operate at LOS D or better. The predicted improvements to intersection operating conditions would reduce congestion and therefore reduce CO emissions.

According to the CO Protocol, projects that could increase traffic volumes by 5 percent or 1,000 vehicles per hour or more should undergo additional analysis to determine if CO impacts could occur. A modeling analysis for CO impacts was completed for the intersections that would be most affected by the Build and No Build alternatives.

Traffic volumes obtained from the traffic analysis (URS 2010a) were used to model

future CO levels near the intersections with the largest traffic volumes. The CALINE4 model was used for the analysis, following the CO Protocol guidelines.

A project is considered to have significant impacts if it results in CO concentrations that exceed the State 1-hour average standard of 20 parts per million (ppm), the Federal 1-hour average standard of 35 ppm, and/or the 8-hour State and Federal average standard of 9.0 ppm. As shown in Table 2.11-2, the maximum predicted concentrations (including background) at the study intersections are below the State and Federal standards for both the No Build and Build alternatives. The proposed project would not cause or contribute to any new localized CO violations, or increase the frequency of an existing CO violation, through at least the project study year and RTP planning year of 2035.

Table 2.11-2 CALINE4 CO Modeling Results

Intersection	CO 1-hour Concentration (ppm)		CO 8-hour Concentration (ppm)	
	No Build	Build	No Build	Build
Airport Boulevard/Bayshore Highway	4.5	4.4	2.0	1.9
Broadway/ US 101 Off-Ramp/ Rollins Road	4.6	4.6	2.1	2.1
Broadway/Carolan Avenue	4.5	4.6	2.0	2.1

Notes:

1. NAAQS for 1-hour CO is 35 ppm and CAAQS for 1-hour CO is 20 ppm. NAAQS and CAAQS for 8-hour CO is 9 ppm.
2. 1-hour and 8-hour background concentrations were obtained from Redwood City station located at 897 Barron Ave., Redwood City, CA 94063.
3. 1-hour background concentration was recorded in 2008 and was found to be 4.3 ppm.
4. 8-hour background concentration was recorded in 2008 and was found to be 1.86 ppm.
5. A persistence factor of 0.7 was used to convert 1-hour CO concentration to 8-hour CO concentration.

Particulate Matter “Hot Spot” Analysis

A qualitative particulate matter hot spot analysis is required for transportation projects that are funded or approved by the FHWA or the FTA and are in Federal nonattainment or maintenance areas for particulate matter less than 10 micrometers in diameter (PM₁₀) or particulate matter less than 2.5 micrometers in diameter (PM_{2.5}). This project is in an area that is in attainment or unclassified for the Federal PM₁₀ standards, so a qualitative PM₁₀ hot spot analysis is not required for project-level conformity purposes. A hot spot analysis for PM_{2.5} is required for the No Build and Build Alternatives because the project is in an area that has recorded violations of the Federal PM_{2.5} standard.

The PM_{2.5} data from the monitoring station closest to the project were analyzed to determine if there could be a future violation at the project location. The closest monitoring station is at 897 Barron Avenue in Redwood City, 11.5 miles southeast of

the US 101/Broadway interchange. The monitoring station recorded exceedances of the Federal PM_{2.5} standards in 2006 and 2007 but no exceedances in 2008 or 2009. Daily traffic volumes are not expected to increase with the Build Alternative, and the project is not expected to contribute to an exceedance of the PM_{2.5} standard.

The proposed project would contribute to PM_{2.5} emissions as a result of tailpipe exhaust, brake wear, and tire wear from vehicles. The number of vehicles in the local area under the Build Alternative in the year 2035 is not expected to increase as compared to the No Build Alternative. The number of heavy-duty trucks (which are the largest contributors to PM_{2.5} emissions) under the Build Alternative would be the same as under the No Build Alternative (URS 2010a). Therefore, the PM_{2.5} emissions under the No Build and Build Alternatives would be similar.

Re-entrained road dust for a PM_{2.5} nonattainment area must be considered in the hot spot analysis only if the USEPA or the State air agency has made a finding that these emissions are a significant contributor to the PM_{2.5} air quality problem. Re-entrained road dust due to the project would be less than significant, since the local traffic volumes would not increase under the Build Alternative as compared to the No Build Alternative (URS 2010a).

Particulate PM_{2.5} and PM₁₀ emissions would also be generated during construction activities. For purposes of the hot spot analysis and project conformity, construction-related particulate emissions are considered temporary if they occur only during the construction phase of the project and last 5 years or less at any individual location. As noted in Section 1.3.1, the construction period would be less than 5 years, and a construction-related PM_{2.5} and PM₁₀ hot spot analysis is not required.

For the reasons described above, a future new or worsened PM_{2.5} violation of NAAQS is not anticipated. Therefore, the proposed project meets the conformity hot spot requirements in 40 CFR 93.116 and 40 CFR 93.123 for PM₁₀ and PM_{2.5}.

Ozone

The BAAQMD adopted the 2005 Ozone Strategy for planning and achieving compliance with the Federal and State ozone standards (BAAQMD 2006). This project would not interfere with the strategy and would provide transportation benefits that reduce pollutant emissions, including precursors to the formation of ozone, by improving traffic operations and efficiency. This project is included in the Bay Area region's RTP (MTC 2009a), which has undergone regional evaluation for conformity with Federal air quality standards, including ozone. The project also

includes pedestrian and bicycle access improvements, which are measures that are consistent with the 2005 Ozone Strategy.

Mobile Source Air Toxics

In addition to the criteria air pollutants for which standards exist, the USEPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources. Mobile source air toxics (MSATs) are a subset of the air toxics defined by the Clean Air Act. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

This section includes a basic analysis of the likely MSAT emission impacts of the proposed project. In the FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts—each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the USEPA's MOBILE6.2 model, the California EPA's EMFAC2007 model, and the USEPA's DraftMOVES2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel particulate matter emissions and significantly overestimates benzene emissions.

Because of these limitations in the methodologies for forecasting health impacts, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.¹²

For the Build and No Build alternatives, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. Because the VMT estimated for the No Build Alternative is higher than for the Build Alternative, higher levels of MSAT are not expected from the Build Alternative compared to the No Build. The Build Alternative would construct a new seven-lane Broadway overcrossing approximately 170 feet to the north of the existing four-lane structure. Broadway would be realigned to extend straight across US 101 from the Broadway/Rollins Road intersection on the west to Bayshore Highway on the east, eliminating the existing curvilinear alignment. The Build Alternative would reduce the distance that vehicles would have to travel among various points within the US 101/Broadway interchange. Since the number of vehicles would be the same under the Build Alternative as the No Build Alternative, the VMT for the Build Alternative would be lower, which may have an incrementally small but beneficial effect on reducing diesel emissions. Therefore, the project is not expected to increase MSAT emissions.

In addition, emissions are expected to be lower than present levels in the design year (2035) as a result of the USEPA's national control programs, which are projected to reduce annual MSAT emissions by 72 percent from 1999 to 2050. Local conditions may differ from national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

Naturally Occurring Asbestos and Structural Asbestos

The US 101/Broadway interchange is not within a mapped area of naturally occurring asbestos (California Geological Survey 2000). The closest area with mapped naturally

¹² FHWA Guidance on Air Toxic Analysis in NEPA Documents (2009), Appendix C. URL: <http://www.fhwa.dot.gov/environment/airtoxic/100109guidapc.htm>

occurring asbestos is near the Highway 92/Interstate 280 interchange, more than 5 miles south of the project area.

The existing Broadway overcrossing and other structures that would be demolished or modified for the proposed project may contain asbestos. Construction of the Broadway overcrossing and ramps was completed in 1949. No construction specifications exist that would allow identification of the exact components of the structure that may contain asbestos. Based on a review of as-built drawings of the overcrossing, structural information from Department bridge maintenance reports (in Hill and Basin Research 2002), and knowledge of typical asbestos-containing materials in bridges from this period, asbestos could be present in the concrete, electrical insulation, expansion joint material, sheet packing in girder joints, and textured paint of the Broadway overcrossing.

The project would acquire and remove some existing industrial and commercial structures within the proposed right-of-way. Structures may contain asbestos in building materials, but this cannot be determined until right-of-way acquisition. Exposure to airborne contaminants from asbestos materials during demolition could affect safety and health.

2.11.3.2. Construction Impacts

Construction activities associated with the proposed project would generate emissions of criteria pollutants throughout the construction period, estimated at approximately 2 to 2.5 years. The following is a qualitative description of the range of potential construction emissions.

Construction is a source of dust emissions that can have temporary impacts on local air quality, such as exceedances of State air quality standards for PM₁₀ and PM_{2.5}. Dust emissions would result from earth moving and heavy equipment use during land clearing, ground excavation, cut and fill operations, and project construction. Dust emissions would vary from day to day depending on the level of activity, the specific operations, and the prevailing weather.

Construction activities would also result in short-term emission of other criteria pollutants and toxic air contaminants from equipment exhaust. Exhaust emissions from construction equipment varies depending on the number and type of equipment used. The primary pollutants associated with exhaust emissions from construction equipment are ozone precursors (reactive organic gases [ROG] and nitrogen oxides

[NO_x]), CO, PM₁₀, and PM_{2.5}. Ozone is derived from NO_x and VOCs in the presence of sunlight and heat.

The proposed project would involve standard construction techniques and require large-scale construction equipment and labor-intensive activities. General site activities would include:

- Site preparation and mobilization of equipment and temporary construction facilities to the site;
- Clearing, utility relocation, and grading;
- Roadway construction and placement of base material and asphalt;
- Curb, gutter, and sidewalk construction;
- Installation of intersection controls; and
- Demobilization of equipment and temporary facilities.

Although construction-related emissions would be temporary in duration, they may be substantial and represent a significant impact to air quality. The BAAQMD CEQA Guidelines (BAAQMD 1999) do not provide a numerical threshold of significance for these emissions, nor is quantification of such emissions required. Instead, the emphasis is on mitigating this type of temporary impact. BAAQMD's approach to analysis of construction impacts is to emphasize implementation of effective and comprehensive control measures, as opposed to a detailed quantification of emissions. BAAQMD considers any project's construction-related impacts to be less than significant if the appropriate dust-control measures are implemented (BAAQMD 1999).

2.11.4. Avoidance, Minimization, and/or Mitigation Measures

Project-related air quality impacts would be limited to the construction period. The Department's Special Provisions and Standard Specifications include the requirement to minimize or eliminate dust through the application of water or dust palliatives. Implementation of the measures below could further minimize air quality emissions during construction. Appropriate measures from among the following will be considered during development of PS&Es for the project construction contract.

- Water all active construction areas daily.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.

- Pave, apply water daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
- Enclose, cover, water twice daily or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.)
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

In addition, pollutant emissions in construction equipment exhaust can be mitigated by the following:

- Keeping engines properly tuned;
- Limiting idling; and
- Avoiding unnecessary concurrent use of equipment.

To avoid or minimize potential impacts from naturally occurring asbestos and structural asbestos, the following measure would be implemented:

- During final project design, a qualified and licensed asbestos inspector should evaluate and sample existing structures scheduled for demolition or modification for the presence of potential asbestos-containing materials. If present, these materials will be handled and disposed accordingly.

Climate change is analyzed in Chapter 2 under “Climate Change (CEQA).” Neither USEPA nor FHWA has promulgated explicit guidance or methodology to conduct project-level greenhouse gas (GHG) analysis. As stated on FHWA’s climate change website (<http://www.fhwa.dot.gov/hep/climate/index.htm>), climate change considerations should be integrated throughout the transportation decision-making process – from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will facilitate decision-making and improve efficiency at the program level, and will

inform the analysis and stewardship needs of project level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders regarding climate change, the issue is addressed in the CEQA chapter of this environmental document and may be used to inform the NEPA decision. The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours traveled.

2.12. Noise

The following summarizes the *Noise Study Report* (Illingworth & Rodkin 2009), which was completed in September 2009.

2.12.1. Regulatory Setting

NEPA and CEQA provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

2.12.1.1. California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible.

2.12.1.2. National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA (and the Department, as assigned) involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations

contain noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 A-weighted decibels [dBA]) is lower than the NAC for commercial areas (72 dBA). Table 2.12-1 lists the noise abatement criteria for use in the NEPA 23 CFR 772 analysis.

Table 2.12-1 Federal Noise Abatement Criteria

Activity Category	Noise Abatement Criteria, Hourly A- Weighted Noise Level, dBA $L_{eq}(h)^{1,2}$	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above
D	–	Undeveloped lands.
E	52 Interior	Residence, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

¹ Noisiest hour is expressed as the energy average of the A-weighted noise level occurring during a one-hour period, or $L_{eq}(h)$.

² Note that criteria is applied as 'approach or exceed' the thresholds, which has been defined as one dBA. For Category B, the "approaching the NAC" is therefore 66 dBA, as applied in this study.

Figure 2.12-1 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

In accordance with the Department's *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects*, August 2006, a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be

reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	
Quiet Urban Daytime	50	Large Business Office Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
Quiet Rural Nighttime	30	Bedroom at Night, Concert Hall (Background)
	20	Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Figure 2.12-1 Noise Levels of Common Activities

The Department’s *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents’ acceptance, the absolute noise level, build versus existing noise, environmental impacts of abatement, public and

local agencies input, newly constructed development versus development pre-dating 1978 and the cost per benefited residence.

2.12.2. Affected Environment

For purposes of this analysis, areas of frequent human usage are considered to occur at exterior locations where people are exposed to traffic noise for at least 1 hour on a regular basis. Land uses that could be subject to traffic and construction noise impacts from the proposed project include a tennis court and pool areas at the Northpark Apartment complex, pool areas at adjacent hotels, and playfields at Bayside Park. These land uses fall within the definition of activity Category B of the NAC (Table 2.12-1). The definition of approaching the NAC is considered 1 dBA below the NAC, and therefore 66 dBA is the applicable criterion for evaluating noise abatement for this study. The study area for noise impacts included the land uses adjacent to the US 101/Broadway interchange and the US 101 mainline and ramps in the project limits. The study area has no Category C land uses that would have frequent human use that would benefit from a lower noise level.

Noise measurements were conducted in May 2009 to determine the existing noise conditions at representative receptor locations in the project area. Both long-term (24 hours) and short-term (two consecutive 10-minute increments) measurements were collected. Measurements were taken at locations that are primarily affected by traffic noise and consisted of defined outdoor activity areas considered to be acoustically equivalent to the Category B activity uses. Traffic conditions were also documented during each measurement. The locations of the measurements are shown in the layout sheets in Appendix A.

Following established methods for a traffic noise study, the short-term and long-term measurements together with the measured traffic conditions, vehicle mix, and site-specific geographical information were then used to determine future noise levels in the project area. Calculated and measured noise levels were compared to assess any differences, to calibrate or validate the FHWA's Traffic Noise Model (TNM) for use in determining noise levels with and without the project, and to consider any applicable noise abatement measures.

Existing noise levels were estimated to range from 58 to 72 dBA $L_{eq(h)}$ at six representative receiver locations. One location—the tennis court at the Northpark Apartments—has an estimated noise level approaching or exceeding the NAC (i.e.,

already at or above 66 dBA without the project). This location is discussed further in Section 2.12.3.

2.12.3. Environmental Consequences

2.12.3.1. Permanent Impacts

Modeling of future year (2035) traffic conditions indicates that noise levels are not expected to approach or exceed the NAC at any locations other than the tennis court at the Northpark Apartments. As shown in Table 2.12-2, four of the six locations would have the same noise levels with and without the project, two locations would have a slight decrease in noise with the project, and all locations would have approximately the same noise levels in the future as under existing conditions. Noise levels at the tennis court would exceed the NAC under the 2035 No Build and Build scenarios; therefore, noise abatement was evaluated for this location.

Table 2.12-2 Loudest Hour Noise Levels and Impacts, $L_{eq}(hr)$ dBA

Receiver ID	Description	Existing	2035 No Build	2035 Build	Impact ¹
ST-1	Tennis court at Northpark Apartments, on roof of parking garage along Rollins Road	72	72	72	A/E
ST-2	Pool area at Northpark Apartments	58	58	58	None
ST-3	Bayside Park, adjacent to Crowne Plaza Hotel parking lot	62	62	62	None
ST-4	Bayside Park, adjacent to Airport Boulevard	59	59	58	None
ST-5	Pool area at Hyatt Regency, along Bayshore Highway east of US 101	61	61	61	None
ST-6	Pool area at Holiday Inn, across from northbound US 101 on- and off-ramps	61	61	60	None

Source: Adapted from Illingworth & Rodkin 2009

¹ Notes:

A/E = The noise level with the project approaches or exceeds the NAC (66 dBA). Noise abatement must be considered.

None = The project would not increase noise levels by 12 dBA or result in future noise levels that approach or exceed the NAC (66 dBA). Abatement consideration is not required.

Among the noise abatement measures identified in the *Traffic Noise Analysis Protocol*, only a soundwall was determined to be potentially suitable. According to

Department and FHWA policies, a soundwall must provide a minimum 5 dBA noise reduction to be considered feasible. Under Department policies, soundwalls should interrupt the line-of-sight between a truck stack (of average height) and a receiver. Caltrans soundwalls are typically constructed to meet the criteria in Chapter 1100 of the Highway Design Manual (Department 2007). The manual states that soundwalls should not be higher than 14 feet above the pavement when located within 15 feet of the edge of traveled way and 16 feet above the ground when located more than 15 feet from the edge of traveled way.

A preliminary noise abatement analysis was conducted to determine whether constructing a soundwall along southbound US 101 would reduce the traffic noise at the tennis court. The soundwall that was modeled extended along the western edge of the length of the US 101 southbound on-ramp from Broadway. Four soundwall heights ranging from 8 to 14 feet were considered, but none reduced the noise level at the tennis court by more than 2 dBA. The modeling results indicated that a soundwall would not provide a feasible noise reduction because the tennis court is on the parking garage roof rather than at ground level. Even the tallest soundwall (14 feet) would barely interrupt the line of sight from a receiver at the tennis court to a truck stack. A 14-foot noise barrier would just interrupt the line of sight to the near lanes of US 101 and would not shield the far lanes. Based on the NAC, a soundwall in this location is not feasible.

The *Traffic Noise Analysis Protocol* states that a traffic noise impact may be considered significant under CEQA if the project is predicted to result in a substantial increase in traffic noise. A substantial noise increase is defined as an increase of 12 dBA $L_{eq(hr)}$ above existing conditions. As shown in Table 2.12-2, the project would not increase noise levels above existing conditions in any of the modeled locations. The traffic noise impacts of the proposed project are considered less than significant under CEQA.

The area between the northern project limits and roughly 500 feet south of Easton Creek within the project area is within the Airport Influence Area for SFO (City of Burlingame 2007). People living or working in the project area would not be exposed to new excessive noise levels as a result of the project's proximity to SFO.

2.12.3.2. Temporary Impacts

Project construction activities that would generate noise include demolition, clearing and grubbing, earthwork, construction of the Broadway overcrossing (including pile

driving), reconfiguration of ramps, and paving. The highest noise levels would result from activities such as structure demolition or pile driving.

Highway construction activities typically occur for relatively short periods of time as construction proceeds along the project's alignment. Construction noise is mostly a concern where impulse-related noise levels from construction activities are concentrated for extended periods of time, where noise levels from individual pieces of equipment are substantially higher than ambient conditions, or when construction activities occur during noise-sensitive hours such as nighttime. For example, the proposed project would require demolition of the existing Broadway overcrossing. This activity will require temporary closures of US 101 and therefore must be performed at night. Demolition could take several weeks, depending on the construction contractor's phasing or sequencing of the work.

Construction of the proposed project would take place during the day and night. Throughout the majority of the construction period, noise levels from construction would be lower than typical average daytime or nighttime noise levels from traffic along US 101. Most construction activities would take place at the Broadway overcrossing, more than 300 feet from nearby receivers, and produce noise levels between 63 and 79 dBA $L_{eq(h)}$. During pile driving or periods when impact tools are used, hourly average noise levels could range from 68 to 79 dBA $L_{eq(h)}$. These construction periods would generate noise levels that exceed typical daytime and nighttime traffic noise.

The reconfiguration of ramps and local roadways could bring construction activities within 100 feet from sensitive receivers. Pile driving in these areas is not expected, but construction noise levels could range from 73 to 79 dBA $L_{eq(h)}$ and exceed ambient hourly average daytime and nighttime noise levels. As most project construction would take place at the Broadway overcrossing, activities within 100 feet of sensitive receivers are expected to be limited.

Typically, work taking place within the Department's right-of-way is not subject to local noise ordinances; however, the Department will work with the contractor to meet local requirements where feasible. The City of Burlingame allows construction operations between the hours of 7:00 AM and 7:00 PM Monday through Friday, between the hours of 9:00 AM and 6:00 PM on Saturday, and between the hours of 10:00 AM and 6:00 PM on Sundays and holidays. Construction activities outside of the allowable hours are prohibited in the Municipal Code, unless a waiver is obtained.

2.12.4. Avoidance, Minimization, and/or Abatement Measures

To abate potential noise impacts from project construction, the following measures will be implemented through requirements set for the construction contractor:

- Prohibit unnecessary idling of internal combustion engines within 100 feet of residences.
- Avoid staging of construction equipment within 200 feet of residences and locate stationary noise-generating construction equipment, such as air compressors, portable power generators, or self-powered lighting systems away from noise-sensitive residences.
- Require all construction equipment to conform to Section 14-8.02, Noise Control, of the latest Standard Specifications.
- Demolition involving impact tools (e.g., hoe-rams) will be necessary at night. The Department will require the contractor to implement a construction noise monitoring program and if feasible provide additional mitigation as necessary (in the form of noise control blankets or other temporary noise barriers, etc.) for affected receivers.

Biological Environment

2.13. Natural Communities

This section is summarized from the *Natural Environment Study* (URS 2010c) for the proposed project, which was completed in April 2010.

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors, fish passage, and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act (FESA) are discussed in the Threatened and Endangered Species section (Section 2.17). Wetlands and other waters are discussed in Section 2.14.

2.13.1. Affected Environment

A biological study area (BSA) was established to evaluate the effects of the proposed project on natural communities and other biological resources. The BSA extends beyond the project footprint to include all of the land surface that could be affected by project construction activities, including paved roadway surfaces; landscaped and disturbed upland habitat around the Broadway overcrossing, along the shoulders of US 101, and adjacent to the Bay Trail and Bayshore Highway; wetlands and waters (including culverted waters); and developed land including buildings and other structures. Paved roadways and developed land account for 75 percent of the BSA's 50.48 acres, and landscaped and disturbed upland habitats account for 20 percent.

2.13.1.1. Vegetation Communities

Other than vegetation associated with wetlands and waters (Section 2.14), none of the natural communities in the BSA are considered uncommon or communities of special concern. The BSA is highly urbanized with predominantly commercial or industrial land uses. Most upland vegetation consists of ruderal, landscaped, or nonnative species. Undeveloped areas and roadsides contain California annual grassland, which primarily consists of exotic grasses. Portions of roadsides, streambanks, and ditches

in the BSA are dominated by landscaped iceplant, a nonnative species that provides minimal habitat value.

A tree survey identified 150 trees over 6 inches diameter at breast height (dbh¹³) in the BSA. Only one individual, a planted 17-inch dbh coast redwood (*Sequoia sempervirens*), was identified as a native species. The remaining trees are planted nonnative species, composed primarily of eucalyptus and acacia varieties including Tasmanian blue gum eucalyptus (*Eucalyptus globulus*), black wood acacia (*Acacia melanoxylon*), silver wattle (*Acacia dealbata*), and Sydney golden wattle (*Acacia longifolia*). Less than 10 individuals each of myoporum (*Myoporum laetum*), horsetail tree (*Casuarina equisetifolia*), and paper bark tree (*Malaleuca quinquenervia*) were identified. Tasmanian blue gum and a similar yet unidentified species dominate the tree strata in the BSA. The average size of blue gum stems in the BSA is 17 inches dbh, and the largest individual tree in the BSA is a blue gum exceeding 40 inches dbh. Eucalyptus species also dominate the BSA in terms of height; the only other trees that approach the eucalyptus in height are the horsetails.

The majority of the trees within the BSA are within existing or proposed State right-of-way. The City of Burlingame has an ordinance defining “protected trees” as trees with a 48 inch or greater diameter at 54 inches (4.5 feet) above ground level. While local tree ordinances do not apply to the State right-of-way, the Department may use them as guidance.

No habitat conservation plans apply to the BSA.

2.13.1.2. Fish Passage

California Senate Bill 857 requires the Department to survey highway system culverts on coastal streams where migratory fish are currently or were historically present and take related actions to systematically review and remediate barriers to fish passage related to transportation projects. A reconnaissance-level fish passage assessment was prepared for Easton Creek (Appendix B in URS 2010c). Easton Creek in the BSA is conveyed in an underground culvert and a concrete channel with little vegetation. The assessment concluded that the US 101 crossing of Easton Creek does not pose a barrier to fish passage and therefore a detailed fish passage assessment was not required.

¹³ Diameter at breast height is the tree diameter taken at 4.5 feet above natural grade.

The unnamed drainage channel between Bayshore Highway and San Francisco Bay near Airport Boulevard (Figure 1-1; Section 1.3.1.6) is not a natural stream and has no existing or historical fish-bearing upstream reach. Therefore, California Senate Bill 857 does not apply to the channel.

2.13.2. Environmental Consequences

2.13.2.1. Vegetation Communities

Roadway realignment, grade elevation, and the construction of retaining walls, abutments, and embankments in the project area would result in 5.03 acres of permanent impacts to vegetation. Vegetation clearing, soil compaction in construction access and staging areas, and equipment storage would result in 3.59 acres of temporary impacts to vegetation. As described above, the BSA is dominated by urban development; neither habitat fragmentation nor impacts to fish passage and wildlife corridors would result from changes in upland habitat. Replacement landscaping would be implemented as part of the project and would minimize impacts to natural communities.

Installation of new freeway ramps, the proposed Broadway overcrossing, and realigned roadways would require removing approximately 71 trees over 6 inches dbh. The majority of trees (estimated at 39) would be removed along southbound US 101 between Easton Creek and the US 101/Broadway interchange, to accommodate the new southbound off-ramp lanes. As noted in Section 2.5.3, other areas of tree removal would include the eastern and western sides of the Broadway overcrossing and the Bayshore Highway area (including behind the gas station at the corner of Bayshore Highway and Airport Boulevard).

2.13.2.2. Fish Passage

As described in Section 1.3.1.7, the proposed project would extend the existing 6-by-6-foot double box culvert for Easton Creek by 42 feet to the east to accommodate the realigned northbound US 101 on-ramp. A temporary creek diversion system will be installed to allow construction of the culvert extension. Other than this short-term diversion of creek flow for culvert extension, the project will not introduce barriers to fish passage in Easton Creek.

2.13.3. Avoidance, Minimization, and/or Mitigation Measures

A project landscaping plan will be developed during final design. The plan will include areas that were previously covered in pavement and areas that were temporarily

disturbed during construction, where feasible. The landscaping plan will include tree planting ratios of 1:1 or greater and the use of native species where possible.

Tree removal would take place before the start of the nesting season for raptors and migratory birds (February 1) to avoid impacts to birds that are protected under the Migratory Bird Treaty Act (MBTA). Vegetation would be preserved in areas of the project limits where no construction is planned.

2.14. Wetlands and Other Waters of the United States

This section is based on the *Jurisdictional Delineation* (completed in August 2010; URS 2010e) and *Natural Environment Study* (completed in April 2010; URS 2010c) for the proposed project.

2.14.1. Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the Federal level, the Clean Water Act (33 USC 1344) is the primary law regulating wetlands and waters. The Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the Clean Water Act, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Section 404 of the Clean Water Act establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the USACE with oversight by the USEPA.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of Federal agencies with regard to wetlands. Essentially, this executive order states that a Federal agency such as the FHWA cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there

is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the State level, wetlands and waters are regulated primarily by the CDFG, the SWRCB, and the RWQCB. In certain circumstances, the Coastal Commission (or BCDC) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify the CDFG before beginning construction. If the CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the Clean Water Act. See Section 2.8 for additional details.

2.14.2. Affected Environment

The following information is from the *Jurisdictional Delineation* (URS 2010e), which was submitted to the USACE in August 2010 for a jurisdictional determination.

Approximately 2.10 acres of potentially jurisdictional waters of the U.S. were identified and mapped in the BSA during the wetland delineation (Table 2.14-1). These features consist of wetlands, other waters of the U.S., and culverts. Surveys identified two tidally influenced drainages that flow through portions of the BSA: Easton Creek and Sanchez Creek. These perennial drainages contain standing or flowing water year-round and are associated with perennial estuarine wetlands that were observed to contain standing water during high tide. Surveys also identified the unnamed channel between Bayshore Highway and San Francisco Bay near Airport Boulevard and the roadside ditches along both sides of US 101 as potentially jurisdictional waters.

Table 2.14-1 Summary of Potentially Jurisdictional Waters of the U.S. in the BSA

Feature	Area	
	Acres	Square feet
<i>Wetlands</i>		
Wetlands and wetland waters of the U.S.	0.51	22,014.05
<i>Nonwetland waters</i>		
Other waters of the U.S.	1.28	55,903.80
Culverted waters of the U.S.	0.31	13,674.45
Total	2.10	91,592.30

Wetlands in the BSA were classified as perennial estuarine wetlands as they occurred along tidally influenced lower floodplains and roadside ditches. Areas of perennial estuarine wetland that were covered predominantly in pickleweed were classified as salt marsh wetlands. One small area of seasonal inundation that was covered primarily in cattail was classified as seasonal cattail wetland.

Potentially jurisdictional features that may provide poor to marginal habitat for special-status species are discussed in Section 2.17.

The wetland delineation did not identify any waters of the State that are not under federal jurisdiction.

2.14.3. Environmental Consequences

2.14.3.1. Permanent and Temporary Impacts

The project would have permanent and temporary impacts to jurisdictional wetlands and other waters of the U.S. in the BSA. Permanent impacts to 0.85 acre of waters of the U.S. would result from constructing new paved roadways, regrading slopes around the footings of the new overcrossing, extending the Easton Creek culvert, and potentially restoring the conveyance capacity of the unnamed drainage channel.

Temporary impacts to 0.72 acre of waters of the U.S. would occur in construction access and staging areas as a result of sediment discharge, vegetation removal, and soil compaction.

Table 2.14-2 lists the areas of anticipated temporary and permanent impacts to potentially jurisdictional wetlands and other waters of the United States. Figures 2.14-1 and 2.14-2 show the individual impact acreages by impact type (permanent or temporary) and feature ID.

Table 2.14-2 Summary of Impacts to Waters of the U.S. by Feature

Feature ID ¹	Impact (square feet)		
	Temporary	Permanent	Total
WWUS 1	0.00	4,362.49	4,362.49
WWUS 3c	1,564.44	4,734.45	6,298.89
WWUS 5	244.23	3,571.64	3,815.87
WWUS 6	0.00	258.68	258.68
WWUS 7	3,292.55	401.86	3,694.41
Subtotal Wetlands	5,101.22	13,329.12	18,430.34
WUS 1	0.00	704.29	704.29
WUS 3b	241.76	527.56	769.32
WUS 5	22,513.86	18,181.10	40,694.96
WUS 6	0.00	858.99	858.99
WUS 7	330.87	923.33	1,254.20
WUS 8	2,262.28	1,557.31	3,819.59
WUS 9	696.89	202.06	898.95
WUS 10	31.58	0.00	31.58
Subtotal Nonwetland Waters	26,077.24	22,954.63	49,031.87
CWUS 1	9.06	0.00	9.06
CWUS 3	0.00	103.62	103.62
CWUS 6	0.00	51.29	51.29
CWUS 7	36.40	0.00	36.40
CWUS 8	8.97	14.15	23.12
CWUS 9	0.00	242.17	242.17
CWUS 12	222.41	25.37	247.77
CWUS 14	0.00	383.17	383.17
Subtotal Culverted Waters	276.84	819.77	1,096.61
Total (square feet)	31,455.29	37,103.52	68,558.82
Total (acres)	0.72	0.85	1.57

¹ See Figures 2.14-1 and 2.14-2.

2.14.3.2. Impacts on Functions and Values

Jurisdictional waters in the BSA function as perennial, intermittent, and ephemeral drainages and roadside ditches. The project would alleviate flooding near the eastern landing of the Broadway overcrossing and Bayshore Highway and would not have substantial adverse impacts on drainage or flood control capacity values.

2.14.3.3. Wetlands Avoidance and Least Environmentally Damaging Practicable Alternative

The No Build Alternative would avoid impacts to wetlands and waters of the U.S. but would not satisfy the project's purpose and need. The Build Alternative has been modified to minimize impacts to these resources. The northern project limits were revised from PM 17.00 to PM 17.06 to avoid construction in the vicinity of Mills Creek. The project limits were also adjusted to minimize the project footprint at the Burlingame

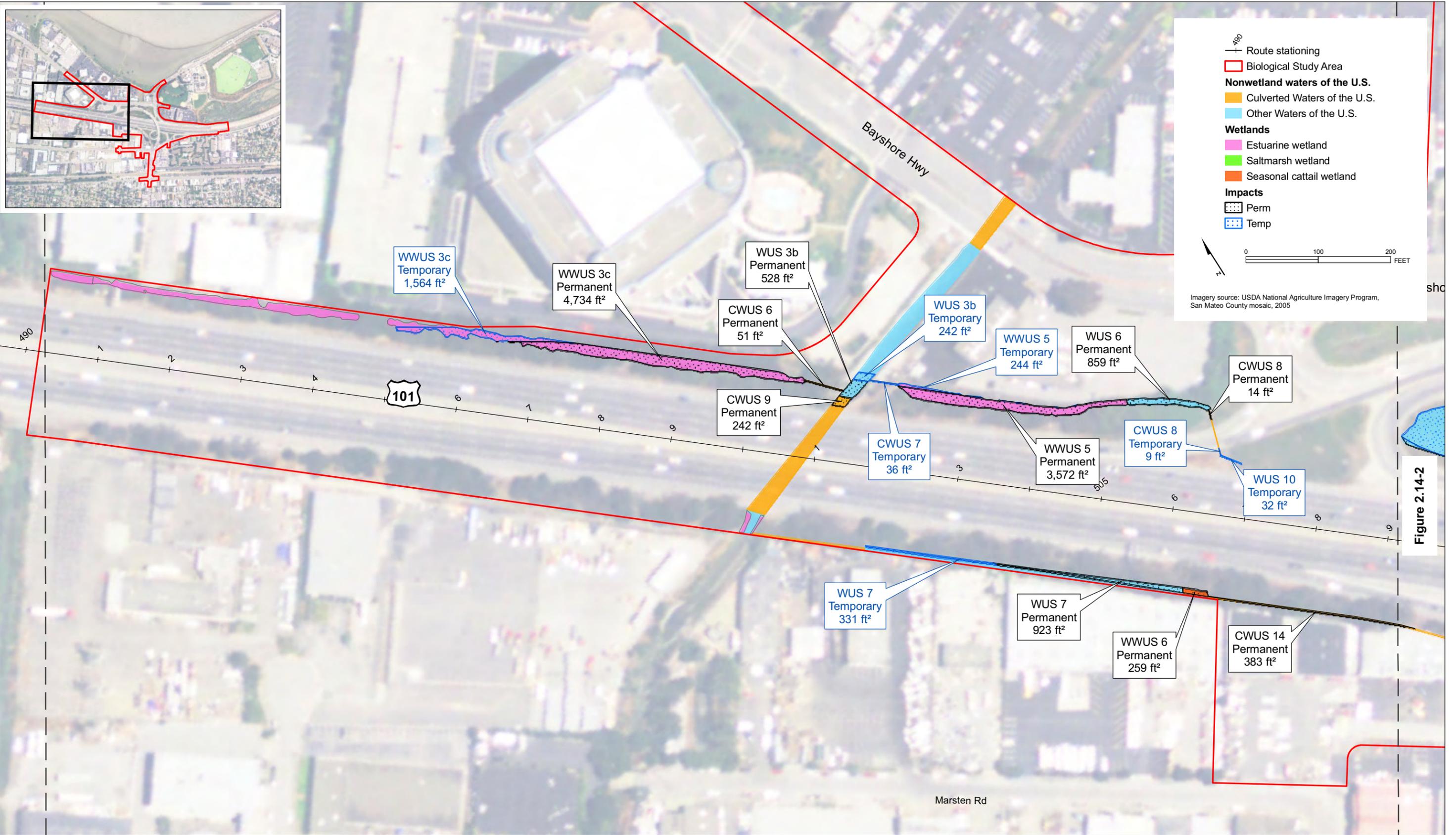
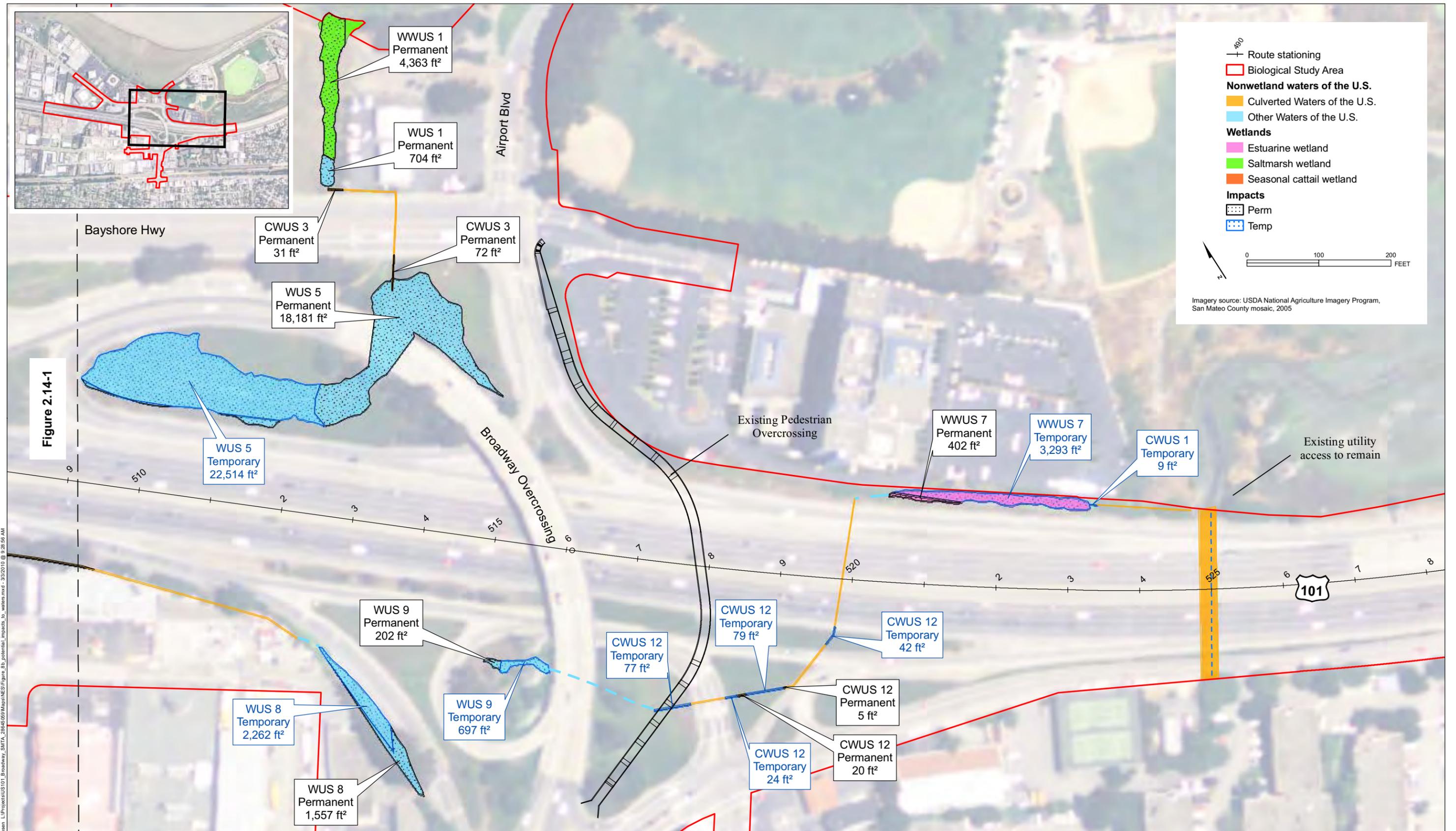


Figure 2.14-2

JRE Corp. - Oakland CA - B Jacobsen L:\Projects\US101_Broadway_SMTA_2646555\Maps\WES\Figure_0a_potential_impacts_to_waters.mxd - 3/2/2016 @ 1:07:12 PM



URS Corp. - Oakland CA - B Jacobson L:\Projects\US101_Broadway_SMTA_2016\05\Map\NE\S\Figure_2b_potential_impacts_to_waters.mxd - 3/3/2016 @ 9:28:56 AM

US 101/BROADWAY INTERCHANGE
RECONSTRUCTION PROJECT
BURLINGAME, CA
EA 235840

Figure 2.14-2
**IMPACTS TO POTENTIALLY
JURISDICTIONAL FEATURES**

Lagoon on the northbound shoulder of US 101. Mills Creek and the Burlingame Lagoon would be designated as ESAs, and contractor access would be prohibited.

2.14.4. Avoidance, Minimization, and/or Mitigation Measures

2.14.4.1. Avoidance and Minimization

The Department's Standard Specifications require the Contractor to submit a SWPPP. This plan must meet the standards and objectives to minimize water pollution impacts set forth in Section 7-1.01G of the Department Standard Specifications. The SWPPP must also comply with the goals and restrictions identified in the RWQCB's Basin Plan. Any additional measures included in the Section 401 certification, Section 1602 Agreement, or Section 404 permit would be implemented. The contractor would also comply with the following standards/objectives, at times referred to as BMPs, including but not limited to:

- Where work areas encroach on live or dry streams, lakes, or wetlands, RWQCB-approved physical barriers adequate to prevent the flow or discharge of sediment into these systems would be constructed and maintained between working areas and streams, lakes, and wetlands.
- Discharge of sediment into streams would be held to a minimum during construction of the barriers.
- Discharge would be contained through the use of RWQCB-approved measures that would keep sediment from entering jurisdictional waters beyond the project limits.
- All off-road construction equipment should be cleaned of potential noxious weed sources (mud and vegetation) before entering the project area and after entering a potentially infested area before moving on to another area. The contractor would employ whatever cleaning methods (typically spraying with a high-pressure water hose) are necessary to ensure that equipment is free of noxious weeds.
- Equipment would be considered free of soil, seeds, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment components or specialized inspection tools is not required. Equipment washing stations would be placed in areas that afford easy containment and monitoring (preferably outside of the project area), and that do not drain into sensitive (riparian, wetland, etc.) areas.

Upon completion of the project, all temporarily affected areas would be restored to approximately the original site conditions. Native salt marsh vegetation along the unnamed drainage channel will be removed and restored. Options for restoration may

include preserving the native plants in a nursery and replanting them after construction is complete, or replanting using plugs from the surrounding remaining vegetation. The specific method and design of channel improvements and replanting options will be further defined during final design and will include coordination with appropriate agency staff.

2.14.4.2. Mitigation

If the minimization and avoidance measures listed in Section 2.14.4.1 are not sufficient to ensure that the adverse effects to the aquatic environment are minimal, other forms of mitigation (rectifying or compensating) may also be used.

Compensatory mitigation at a minimum 1:1 ratio is required for all permanent wetland impacts unless the USACE District Engineer determines and states in writing that other forms of mitigation are more appropriate. Compensation for permanent impacts to jurisdictional wetlands potentially includes one or a combination of the following measures:

- Purchase of wetland creation credits from a USACE-approved mitigation bank;
- Purchase of wetland preservation or enhancement credits from a USACE-approved mitigation bank;
- Onsite restoration or enhancement of wetlands and other waters; or
- Onsite creation of wetlands and other waters.

The mitigation must be available and feasible considering costs, technology, and logistics in light of overall project purposes.

A Compensatory Mitigation Proposal will be submitted to the USACE prior to construction. Proposed compensation includes restoring and revegetating all temporarily affected wetlands. Additional compensatory mitigation efforts will be determined in consultation with USACE. These may include, but are not limited to, reduction in the amount of impact, options to participate in regional habitat enhancement projects, or purchase of mitigation bank credits.

The BCDC may also require compensatory mitigation for any affected wetlands and the placement of Bay fill within its jurisdiction. This will be determined as part of the BCDC permitting process.

2.15. Plant Species

This section is based on the *Natural Environment Study* (URS 2010c) for the proposed project, which was completed in April 2010.

2.15.1. Regulatory Setting

The USFWS and CDFG share regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the FESA and/or the California Endangered Species Act (CESA). See Section 2.17 for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including CDFG fully protected species and species of special concern, USFWS candidate species, and non-listed California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at 16 USC 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at Fish and Game Code Section 1900-1913, and the California Environmental Quality Act, PRC Sections 2100-21177.

2.15.2. Affected Environment

Lands in the BSA are highly disturbed, generally urbanized, and dominated by nonnative or landscape species, as described in Section 2.13.1.

A California Natural Diversity Data Base (CNDDB) query indicated that no rare or sensitive plants have been reported in the BSA (CDFG 2010). The CNPS online Inventory of Rare and Endangered Plants (CNPS 2009) and the USFWS species list (see Appendix I) were also consulted. Based on the geographic range of various potential sensitive species and existing habitats in the BSA, 17 special-status plant species were evaluated for potential to occur in the BSA. One federally listed endangered plant, California seablite (*Suaeda californica*), was also evaluated, as described in Section 2.17.

The entire BSA was surveyed for rare plant species and potential habitat that could support special-status plants. The floristic-level survey took place on March 31 and April 1, 2009. The 17 special-status plants identified in the record searches would have been identifiable (e.g., blooming or vegetative) had they been present at the time of the field survey. No special-status plants or plant communities of special concern were identified in the BSA.

2.15.3. Environmental Consequences

No plant communities of special concern exist within the study area. No adverse impacts would occur to special-status plant species.

2.15.4. Avoidance, Minimization, and/or Mitigation Measures

No avoidance and minimization measures are necessary.

2.16. Animal Species

This section is based on the *Natural Environment Study* (URS 2010c) for the proposed project, which was completed in April 2010.

2.16.1. Regulatory Setting

Many State and Federal laws regulate impacts to wildlife. The USFWS, the National Marine Fisheries Service (NOAA Fisheries), and the CDFG are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under CESA or FESA. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.17. All other special-status animal species are discussed here, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act;
- Migratory Bird Treaty Act; and
- Fish and Wildlife Coordination Act.

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act;
- Sections 1600–1603 of the Fish and Game Code; and
- Section 4150 and 4152 of the Fish and Game Code.

2.16.2. Affected Environment

Wildlife species common to urban habitats and degraded ruderal vegetation communities are expected to inhabit the BSA. These species could include red foxes (*Vulpes vulpes*), feral cats (*Felis catus*), raccoons (*Procyon lotor*), ground squirrels (*Spermophilus beecheyi*), Norway rats (*Rattus norvegicus*), western fence lizards (*Sceloporus occidentalis*), and various salamanders. Signs of raccoons and feral cats were observed during surveys.

A wide variety of shorebirds and waterfowl use aquatic resources in and adjacent to the BSA for migratory stopovers, overwintering grounds, or year-round residence. Wildlife observed during field surveys were primarily shorebirds and waterfowl and included mallards (*Anas platyrhynchos*), western gull (*Larus occidentalis*), snowy egrets (*Egretta thula*), great blue herons (*Ardea herodias*), ravens (*Corvus corax*), and scrub jays (*Aphelocoma californica*).

Special-status birds and essential fish habitat are described in more detail below.

2.16.2.1. Special-Status Birds

The only special-status birds with potential to occur in the BSA are Alameda song sparrow (*Melospiza melodia pusillula*), nesting raptors protected under California Fish and Game Code Section 3503.5, and migratory birds protected under the MBTA.

Suitable habitat for the Alameda song sparrow, a State species of concern, is present outside of the BSA in the Burlingame Lagoon. There are no CNDDDB (CDFG 2010) records for the Alameda song sparrow within a 3-mile radius of the BSA. Neither suitable habitat nor individuals were observed during field surveys of the BSA. Threats to the Alameda song sparrow and other nesting birds include any factors that would lead to nesting failure. Loud construction activities such as pile driving in the vicinity of nesting habitat can disturb the species and lead to nest abandonment by masking communication between individuals.

The trees and shrubs in the BSA may provide nesting, foraging, and roosting habitat for nesting raptors protected under California Fish and Game Code Section 3503.5, including the white-tailed kite (*Elanus leucurus*), American peregrine falcon (*Falco peregrinus*

anatum), and northern harrier (*Circus cyaneus*). In addition, the white-tailed kite and American peregrine falcon are California fully protected species, and the northern harrier is a California species of special concern. Other potential nesting raptors in the BSA include the red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), and sharp-shinned hawk (*Accipiter striatus*). Threats to all of these species include habitat fragmentation, nesting failure due to disturbance, and loss of foraging habitat.

The MBTA makes it unlawful at any time, by any means, or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season. Many species of migratory birds may inhabit the BSA at a time, including migratory shorebirds and waterfowl, cliff swallows, barn swallows, and double-crested cormorants.

During field surveys, two mallard ducks were observed in Easton Creek between US 101 and Bayshore Highway. In addition, double-crested cormorants have been documented nesting on electric transmission towers throughout the Bay Area, and could potentially use the transmission towers within the BSA as rookery (nesting) sites. Foraging shorebirds can be expected to use mudflats and salt marshes surrounding the BSA to forage, while waterfowl—both dabbling and diving ducks—may be present in any of the creeks and drainages in the BSA.

Also during field surveys, birds were heard calling in the tall canopies of the eucalyptus and horsetail trees but were not seen. No nests were detected in the branches of the trees in the BSA. Several nests were observed under the Broadway overcrossing, although it was not clear which species were nesting there.

2.16.2.2. Essential Fish Habitat

The Magnuson-Stevens Fisheries Conservation and Management Act defines Essential Fish Habitat (EFH) as waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity. The south-central portion of San Francisco Bay (from the Bay Bridge to the San Mateo Bridge) serves as habitat for commercially important fish and sharks that are federally managed under two fisheries management plans (FMPs) with designated EFH: the Pacific Groundfish FMP and the Coastal Pelagic FMP (NOAA Fisheries 2008). San Francisco Bay is also designated as a Habitat Area of Particular Concern for various species within the Pacific Groundfish and Coastal Pelagic FMPs because it serves as important breeding and rearing grounds for these fish stocks.

Easton Creek is the only area of the BSA that is identified as EFH.

2.16.3. Environmental Consequences

2.16.3.1. Special-Status Birds

The project would have no direct impacts on the Alameda song sparrow because suitable habitat for the species is absent from the BSA. No individuals were observed in potentially suitable habitat outside of the BSA in the Burlingame Lagoon.

Temporary pile-driving noise is expected to have a negligible effect on individual birds, including the Alameda song sparrow and any potential nesting habitat in the Burlingame Lagoon. Ambient highway noise levels (defined as up to 83 decibels¹⁴) are not known to harm this species or other birds or to cause nesting failure. Pile driving and other loud construction activities are anticipated to have maximum noise levels of 95 decibels at a distance of 100 feet from the source. Construction noise decreases at a rate of 6 decibels per doubling of distance from the noise source, and shielding by terrain or structures can provide an additional 5 to 10 decibels of noise reduction (Illingworth and Rodkin 2009). Accordingly, pile driving noise will diminish to ambient highway noise levels within 400 feet or less of the pile driving locations. The closest pile-driving location is approximately 700 feet from potential Alameda song sparrow habitat in the Burlingame Lagoon (Department 2009f).

No permanent impacts to individual special-status and other nesting raptors are anticipated with implementation of the avoidance and minimization measures proposed in Section 2.16.4.1. Vegetation would be removed during nonbreeding/nesting period, and if that cannot be achieved, surveys and buffers would be applied until the nesting activity is completed. The potential loss of foraging habitat would be negligible, as the quantity of suitable foraging habitat in the BSA is small compared to that available in adjacent areas.

With implementation of the specific avoidance and minimization measures proposed in Section 2.16.4.1, permanent impacts to migratory birds (including take of individuals, nestlings or eggs) are not anticipated from project construction.

¹⁴ A decibel is a unit for measuring sound pressure levels. In general, highway noise levels are typically 70 to 80 decibels during heavy traffic periods (Appendix B of Caltrans 2009). Here, 83 decibels represents the maximum instantaneous intensity of a single sound event—a peak in highway noise (Appendix B of Caltrans 2009).

2.16.3.2. Essential Fish Habitat

The segment of Easton Creek between US 101 and Bayshore Highway travels through a concrete channel with little vegetation. The proposed project will extend the existing 6-by-6-foot double box culvert by 42 feet to the east to accommodate the realigned northbound US 101 on-ramp. The project design will incorporate Department BMPs for storm water pollution prevention (Section 2.8.4) and the general construction measures identified in Section 2.16.4.2. These measures will minimize project-related effects to EFH. In addition, although southern Distinct Population Segment North American green sturgeon (*Acipenser medirostris*; see Section 2.17.2.2) is not included in the Pacific Groundfish and Coastal Pelagic FMPs, the species has similar habitat requirements to many benthic species managed under the Pacific Groundfish FMP. As a result, the conservation measures proposed for green sturgeon identified in Section 2.17.4 will also minimize effects to EFH. Informal consultation for effects to EFH will take place as part of the Department's concurrence request to NOAA Fisheries.

2.16.4. Avoidance, Minimization, and/or Mitigation Measures

2.16.4.1. Special-Status Birds

Implementation of the following specific avoidance and minimization measures would prevent impacts to special-status and other nesting raptors, and migratory birds. The following consolidates raptor and migratory bird measures listed in the project's Natural Environment Study (URS 2010c).

- Schedule vegetation removal during nonbreeding season: To avoid disruption or impacts to nesting raptors and other nesting birds, removal of vegetation (trees and ground cover) in the project's construction area should occur during the nonbreeding season, from September 1 to February 1.
- Focused preconstruction surveys: If construction is scheduled during the nesting season (February 1 through August 30), trees and vegetation within and extending approximately 500 feet from the perimeter of the construction area would be subject to a preconstruction survey. The Broadway overcrossing and pedestrian overcrossing would be included in the survey to identify nesting activity on or underneath these structures. The preconstruction survey should be completed no more than 15 days prior to ground-disturbing activities.
- Establish buffer areas if active nesting is identified: If an active nest is found, a temporary buffer area may be defined to restrict construction activities. A qualified biologist would determine the appropriate buffer size based on the type

of construction activity and type of affected species, and delineate the buffer using ESA fencing, pin flags, and/or yellow caution tape. The size of the buffer may vary for different species. A 300-foot radius buffer would be used unless otherwise defined by the biologist. Clearing and construction within the buffer would be postponed until the active nest is vacated and the juveniles have fledged, as determined or verified by the biologist, and there is no evidence of second nesting attempts.

- **Biological monitoring:** If nesting activity is identified within the project's construction area and a buffer area is established, a qualified biologist would check the nest area approximately weekly for potential disturbances associated with construction. Construction within the buffer would be prohibited until the biologist determines the nest is no longer active. In the event that nesting birds are present and attempt to build nests during construction, a biologist would work with CDFG to implement a strategy to prevent nests from becoming established.

2.16.4.2. Essential Fish Habitat

Standard Department BMPs for water pollution control (Section 2.8.4) and the general construction measures listed below would minimize project-related effects to EFH. No additional measures are proposed.

General Construction Measures

The measures listed below will be implemented as part of construction to minimize and/or avoid impacts to sensitive species and habitat as well as to common biological resources.

- **Construction Work, Access, and Staging Areas.** All proposed construction will be limited to the existing and proposed right-of-way. ESAs will be identified on contract plans and discussed in the Special Provisions. The ESAs will include areas designated in the environmental document and biological reports that support wetlands, waters, and/or habitats that potentially support listed species, and have been specifically identified to avoid during construction. ESA provisions may include, but are not limited to, the use of temporary orange fencing to delineate the proposed limit of work in areas adjacent to sensitive resources, or to delineate and exclude sensitive resources from potential construction impacts. Contractor encroachment into ESAs will be restricted (including the staging/operation of heavy equipment or casting of excavation materials). ESA provisions will be implemented as a first order of work and remain in place until all construction is completed.

- **Work In Waterways.** One or more temporary cofferdam(s) will be required to install the Easton Creek culvert extension. Only clean gravel or sand fill will be used for construction of the cofferdams. The downstream outlet of the diversion pump will be screened with 1/4-inch to 5/8-inch mesh screen material during all dewatering. If sediment removal in the unnamed drainage channel is required, work will take place after upstream culvert work is complete. If the berm separating the unnamed drainage channel from San Francisco Bay is removed, it would be removed after completion of the culvert work (including sediment removal, if necessary) and during low tide.
- **Construction Discharges.** No debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products or other organic or earthen material shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the United States or drainages. No discharges of excessively turbid water will be allowed, and all equipment will be well-maintained and free of leaks.
- **Onsite Construction Personnel Education Program.** Before the onset of construction and within 5 days of any new worker arrival, a USFWS-qualified biologist will conduct an education program for all construction personnel. At a minimum, the training will include a description of California red-legged frog, San Francisco garter snake, and other listed species and their habitats; the potential occurrence of these species within the project area; an explanation of the status of these species and protection under the FESA, CESA, and all other federal, state, and local regulatory requirements; the measures to be implemented to conserve listed species and their habitats as they relate to the work site; and boundaries within which construction may occur. A fact sheet conveying this information will be prepared and distributed to all construction crews and project personnel entering the project footprint. Upon completion of the program, personnel will sign a form stating that they attended the program and understand all of the avoidance and minimization measures and implications of the FESA, CESA and all other federal, state, and local regulatory requirements.
- **Erosion Control.** Temporary erosion control and slope stabilization BMPs will be installed before the start of the wet season (October 15 through April 15). Erosion control measures may include silt fencing, straw wattles, coir blankets, sediment traps, and other protective measures to minimize the potential for erosion of sediment beyond the work area or degradation of water quality in adjacent aquatic habitats.
- **Restoration/Revegetation.** Upon project completion, the slopes at the foot of each end of the overcrossing will be regraded and revegetated with regionally

appropriate native species or non-persistent hybrids, per recommendation of a Landscape Architect. A post-construction monitoring plan will be developed during final design, and re-establishment of vegetation and control of nonnative invasive species will be periodically monitored consistent with the plan.

2.17. Threatened and Endangered Species

The following section is summarized from the *Natural Environment Study* (completed in April 2010; URS 2010c) and *Biological Assessment* (completed in August 2010; URS 2010d) for the proposed project.

2.17.1. Regulatory Setting

The primary Federal law protecting threatened and endangered species is the FESA (16 USC Section 1531, et seq.; see also 50 CFR Part 402). This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of the FESA, Federal agencies such as FHWA are required to consult with the USFWS and NOAA Fisheries to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion or an incidental take permit. Section 3 of the FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the State level, the CESA (California Fish and Game Code, Section 2050 et seq.). The CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The CDFG is the agency responsible for implementing CESA. Section 2081 of the California Fish and Game Code prohibits take of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the California Fish and Game Code as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFG. For projects requiring a Biological Opinion under Section 7 of the FESA, the CDFG may

also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

2.17.2. Affected Environment

2.17.2.1. Federal and State Consultation Process

USFWS species records were reviewed at the outset of the biological studies for the project as well as in December 2009 and June 2010. A copy of the USFWS species list is included in Appendix I. The CNDDDB (CDFG 2010) and CNPS online Inventory of Rare and Endangered Vascular Plants of California (CNPS 2009) were used to identify state-listed threatened and endangered species. URS biologists conducted an early season plant survey and a general terrestrial wildlife habitat assessment of the BSA on March 31 and April 1, 2009, and a reconnaissance-level habitat assessment for California red-legged frog (CRLF) and San Francisco garter snake (SFGS) on January 29, 2010.

As a result of a review of the USFWS species list, species occurrence databases and literature, the rare plant survey, and the reconnaissance-level wildlife habitat assessments, the species and critical habitat listed in Table 2.17-1 were considered to have potential to occur in the BSA.

Table 2.17-1 Threatened and Endangered Species Considered in the Biological Study Area

Common Name	Scientific Name	Status ¹
<i>Plant</i>		
California seablite	<i>Suaeda californica</i>	FE
<i>Fish</i>		
Green sturgeon, southern distinct population segment (DPS)	<i>Acipenser medirostris</i>	FT, Ssc
Critical Habitat: Green sturgeon, southern DPS	<i>Acipenser medirostris</i>	Designated October 9, 2009
Central California Coast steelhead DPS	<i>Oncorhynchus mykiss irideus</i>	FT
<i>Amphibian</i>		
California red-legged frog	<i>Rana draytonii</i>	FT, Ssc
<i>Reptile</i>		
San Francisco garter snake	<i>Thamnophis sirtalis tetrataenia</i>	FE, SE, CaFP
<i>Birds</i>		
California black rail	<i>Laterallus jamaicensis coturniculus</i>	ST, CaFP
California clapper rail	<i>Rallus longirostris obsoletus</i>	FE, SE, CaFP
<i>Mammal</i>		
Salt marsh harvest mouse	<i>Reithrodontomys raviventris</i>	FE, SE, CaFP

¹ CaFP = California fully protected
FE = Federal endangered
FT = Federal threatened

Ssc = California species of special concern
SE = State endangered
ST = State threatened

Endangered species consultation with the USFWS and/or NOAA Fisheries is necessary when a project has the potential to affect federally listed species and/or destroy or adversely modify designated critical habitat. The proposed project has the potential to affect five federally listed species under the jurisdiction of the USFWS: California seablite, CRLF, SFGS, California clapper rail, and salt marsh harvest mouse. The Department, as assigned by the FHWA, initiated Section 7 consultation with the USFWS in August 2010 by submitting a Biological Assessment (BA) that addresses potential effects to these species.

The proposed project has the potential to affect two federally listed species and designated critical habitat for one species under the jurisdiction of NOAA Fisheries: green sturgeon, southern distinct population segment (DPS), Central California Coast steelhead DPS, and critical habitat for southern DPS green sturgeon. The Department will seek informal consultation with NOAA Fisheries for concurrence on its determinations of potential effects to these species and critical habitat.

Endangered species consultation with the CDFG is necessary when a project may result in the take of a state-listed species. The proposed project has the potential to affect California black rail as well as species listed as endangered under both FESA and CESA (SFGS, California clapper rail, and salt marsh harvest mouse). The Department will consult with CDFG to obtain a consistency determination for impacts to state-listed species and to ensure that proposed measures are sufficient to avoid impacts to California fully protected species.

2.17.2.2. Species Addressed in Consultation

California Seablite

The nearest CNDDDB record for this species is approximately 10 miles north of the BSA at Heron's Head Park, Port of San Francisco, and was planted for restoration purposes (CDFG 2010).

The BSA is within the Central/South Bay Recovery Unit of the USFWS *Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (USFWS 2010a). The plan recommends acquiring or protecting currently unprotected habitat for California seablite, as well as augmenting existing populations and initiating new subpopulations in suitable habitat in San Francisco Bay.

The BSA contains marginal potential habitat for California seablite along the unnamed drainage channel between Bayshore Highway and San Francisco Bay near Airport Boulevard. The channel was identified as a potentially jurisdictional salt

marsh wetland (WWUS 1 in Figure 2.14-2) in the wetland delineation. The narrow channel banks are vegetated with sparse, short stands of pickleweed, alkali heath, marsh gumplant, and extensive nonnative iceplant.

California seablite was not identified in the unnamed drainage channel during rare plant surveys of the BSA and adjacent marshes on March 31 and April 1, 2009. Because the species is an evergreen shrub, it is likely that surveys would have identified it, if present.

Southern DPS Green Sturgeon

Juvenile and subadult green sturgeon occur throughout the Sacramento River Delta and San Francisco Bay (Calfish 2009). No current or historic spawning locations for green sturgeon are known in the southern San Francisco Bay drainages; however, the South Bay contains migrant green sturgeon throughout the year in both the seawater and mixing zones (Miller and Kaplan 2001). During the spring months, sport fishermen catch sturgeon—most often white—from the Dumbarton Public Fishing Pier on the east side of the Bay. The CDFG estimates that one-fifth of the sturgeon landed in the estuary are green sturgeon and that the rest are white sturgeon (Moyle 2002).

Easton and Sanchez creeks in the BSA are directly connected to green sturgeon habitat in greater San Francisco Bay. These creek segments are in engineered underground or open concrete culverts that receive urban runoff, undergo annual sediment/debris removal, and contain little or no water during low tides. As a result, potential foraging habitat for green sturgeon within these creek segments is considered marginal.

Because green sturgeon are highly mobile, migratory, found throughout the Bay, and capable of foraging in shallow water, it is possible that an occasional juvenile or subadult green sturgeon could venture into Easton and Sanchez creeks. As Sanchez Creek in and upstream of the action area is in a 900-ft-long underground culvert, any green sturgeon that enter the creek via the Burlingame Lagoon would remain downstream of the action area.

Green sturgeon would not have access to the unnamed drainage channel between Bayshore Highway and San Francisco Bay near Airport Boulevard, as described in the “Central California Coast Steelhead DPS” discussion above. If the berm that separates the channel from the Bay is removed as part of the proposed project, the species may occasionally stray into the channel. However, the absence of upstream spawning opportunities and suitable instream foraging would make the unnamed drainage channel marginal potential habitat.

Critical Habitat for Southern DPS Green Sturgeon

On October 9, 2009, NOAA Fisheries issued a final rule to designate critical habitat for the southern DPS green sturgeon (74 Federal Register 52299–52351). Under this rule, the entire San Francisco Bay below mean higher high water is designated as critical habitat. Designated critical habitat includes spawning and rearing areas in freshwater and rearing habitats in coastal marine waters and bays and estuaries. All tidally influenced waters of San Francisco Bay and the tidally influenced reaches of specified tributaries are included in this designation. This includes the sections of Easton and Sanchez creeks within the BSA, which are below mean higher high water of the Bay and are tidally influenced (NOAA Fisheries 2009). The unnamed drainage channel between Bayshore Highway and San Francisco Bay is not within designated critical habitat.

Central California Coast Steelhead DPS

The Central California Coast (CCC) steelhead DPS includes all naturally spawned anadromous steelhead populations below natural and human-made impassable barriers in California streams from the Russian River to Aptos Creek, and the drainages of San Francisco, San Pablo, and Suisun bays eastward to Chippis Island at the confluence of the Sacramento and San Joaquin Rivers (NOAA Fisheries 2007).

Surveys of the BSA found that Easton and Sanchez creeks lack the habitat elements required for CCC steelhead spawning and rearing. Both creeks are brackish and have variable water levels because of tidal influx from the Bay; in fact, the creeks can contain little or no water during low tide. Logs, deep pools, and other escape cover are absent from the creek segments in the BSA.

For most of the lengths of Easton and Sanchez creeks, the channels are highly modified, engineered, or culverted, which makes them unsuitable as migratory corridors. The creeks drain urban areas of Burlingame and parts of Hillsborough from east of Interstate 280. The creeks also are degraded from urban runoff and annual sediment/debris removal. No historic occurrences of anadromous fish have been recorded in Easton and Sanchez creeks (Calfish 2009; Leidy et al. 2005a; Leidy et al. 2005b).

The only other surface water in the BSA is the unnamed drainage channel between Bayshore Highway and San Francisco Bay near Airport Boulevard (Section 1.3.1.6). The channel is not a natural stream and has no fish-bearing upstream reach. A berm separates the channel from the Bay and prevents CCC steelhead and other fish from entering the channel.

Designated critical habitat for CCC steelhead (NOAA Fisheries 2005) includes freshwater spawning sites, rearing sites, migration corridors, and estuarine areas free of obstruction. No designated critical habitat for CCC steelhead was identified in the BSA.

California Red-Legged Frog

No CRLF occurrences have been recorded in the BSA. The closest CNDDDB occurrence was recorded near SFO, approximately 1.70 miles northwest of the BSA. Additional CRLF occurrences are documented in USFWS biological opinions, informal consultation communications, and environmental documents for other projects near the BSA (City of Burlingame 2004; Kobernus 2009; McGinnis 2002; TRA 2007; USFWS 2009c, d). Adult CRLF were sighted on two occasions approximately 0.10 mile northwest (and outside) of the BSA. In 2001, an adult CRLF was sighted on the northwest side of David Avenue near Rollins Road (Kobernus 2009; TRA 2007), and in 2004, an adult CRLF was sighted near a freshwater drainage ditch adjacent to 1510 Rollins Road (TRA 2007). Both sightings are west of US 101, north of Mills Creek.

Approximately 0.20 mile northwest (and outside) of the BSA, a breeding population of CRLF has been reported in a freshwater drainage along a PG&E transmission corridor (McGinnis 2002; City of Burlingame 2004). Approximately 0.85 mile north of the BSA, another breeding population of CRLF exists in the southern half of the US 101/Millbrae Avenue interchange (City of Burlingame 2004).

No protocol-level CRLF surveys have been conducted for the proposed project. URS biologists conducted a general terrestrial wildlife habitat assessment of the BSA on March 31 and April 1, 2009, and a reconnaissance-level habitat assessment for CRLF and SFGS on January 29, 2010. No CRLF or other frogs were observed in the BSA during the assessments.

Salinity from tidal influence renders most aquatic areas in and near the BSA generally unsuitable for CRLF aquatic habitat.¹⁵ Easton Creek and several ditches along both sides of US 101 within the BSA, as well as Mills Creek and the Burlingame Lagoon outside of the BSA, are all exposed to tidal influence. Seasonal ponding from roadway runoff around the eastern and western touchdowns of the Broadway overcrossing does not remain in place long enough to support CRLF aquatic use.

¹⁵ CRLF are sensitive to high salinity (USFWS 2002). Their maximum salinity tolerance is about 9.0 parts per thousand (ppt) for adults, 6.0 ppt for embryos, and 4.5 ppt for eggs (Jennings and Hayes 1990).

The US 101/Broadway interchange medians are not suitable or accessible as CRLF aquatic or upland habitat. The upland areas of the medians were used for construction staging and access for the US 101 Auxiliary Lanes Project through late 2009, resulting in ground compaction and removal of or disturbance to small mammal burrows and landscaped/ruderal vegetation that could have provided marginal cover for CRLF terrestrial use. These areas are also isolated from known CRLF occurrences and breeding populations by the concrete median barrier of US 101, the paved freeway and ramps, and associated vehicular traffic.

Two aquatic areas in the BSA could at times provide marginal potential CRLF breeding habitat, although there is no indication that CRLF are using these or any other features in the BSA for breeding (Figure 2.17-1). The first is a noncontiguous seasonal, apparently isolated freshwater area adjacent to estuarine wetlands east of US 101. The second is a seasonal emergent wetland west of US 101. Both features contain cattails (*Typha* sp.), sedge (*Cyperus* sp.), and ornamental species such as blackwood acacia. On the survey days in 2009, these areas were identified as primarily brackish and exposed to tidal influence (URS 2009k); however, in January 2010, the features had salinities during high tide that were within the tolerance range of all CRLF life stages. It is unclear whether the water depth and freshwater conditions persist long enough for CRLF to successfully breed.

Both features have potential connectivity to known CRLF breeding populations or sighting locations by way of the vegetated shoulders of US 101 or the banks of Mills Creek, or through the beds of Mills or Easton creeks and roadside drainages at low tide when less brackish water is present. Although there is no indication that CRLF are using these or any other areas in the BSA, these areas are considered marginal potential habitat for CRLF upland dispersal and aquatic foraging and dispersal (Figure 2.17-1).

The BSA lies outside of designated critical habitat for CRLF (USFWS 2010b). The closest designated critical habitat is Unit SNM-1 in San Mateo County, which is west of Interstate 280, approximately 3 miles southwest of the BSA. The proposed project would not affect designated or proposed critical habitat for CRLF.

San Francisco Garter Snake

The nearest recorded occurrence of San Francisco garter snake (SFGS) is approximately 1.70 miles northwest of the BSA. SFGS typically do not move distances of more than 0.6

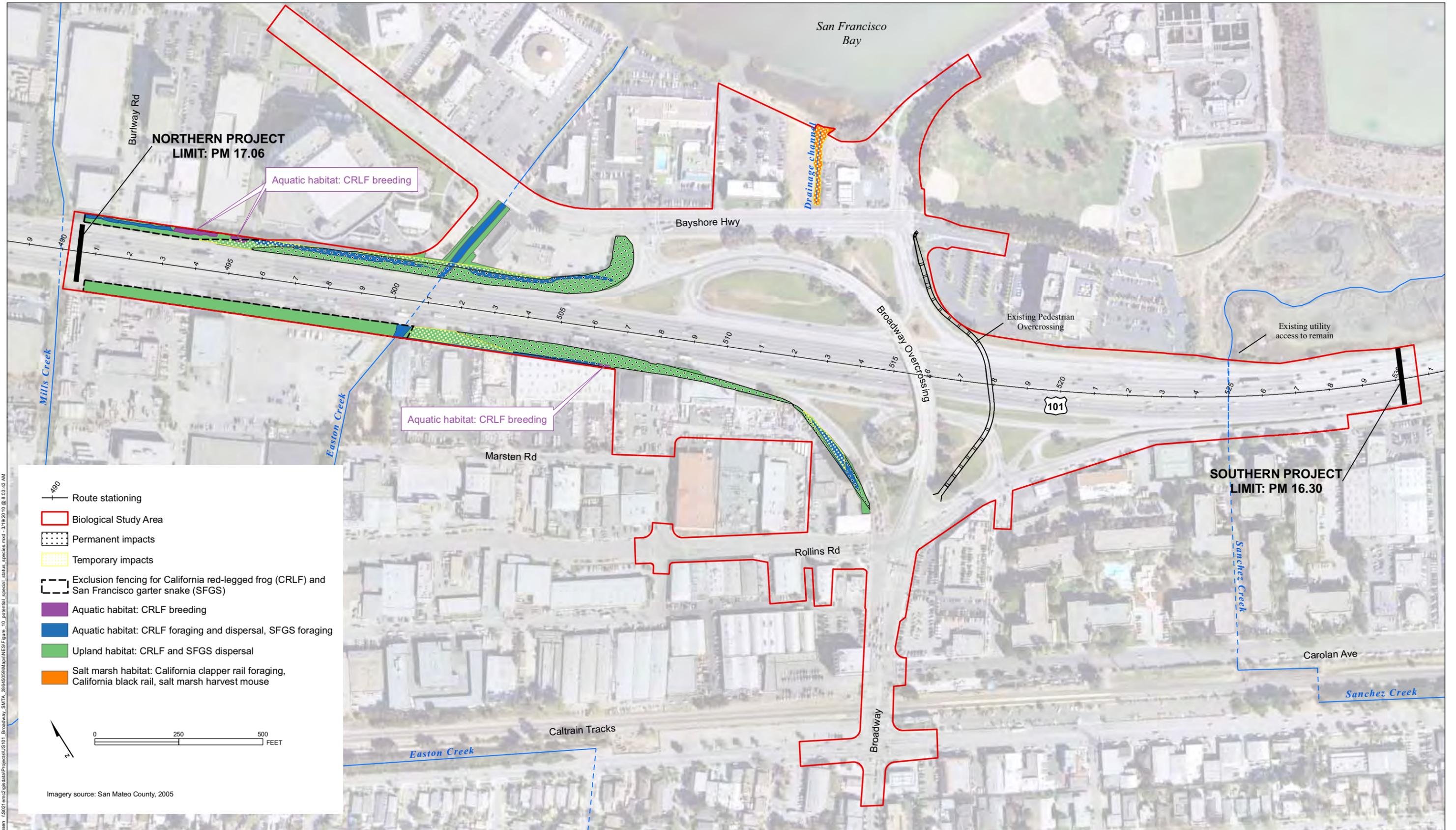
mile (USFWS 2006b). Therefore, the BSA appears to be outside of the species' dispersal range from the nearest SFGS occurrence.

The BSA lacks the vegetation and aquatic features that provide optimal SFGS habitat. Upland areas of the Broadway interchange medians were used for construction staging and access for the US 101 Auxiliary Lanes Project through late 2009, resulting in ground compaction and removal of or disturbance to small mammal burrows and landscaped/ruderal vegetation that could have provided marginal potential SFGS habitat. Moreover, the median barrier of US 101, the paved freeway and ramps, and associated vehicular traffic would prevent SFGS movement into the interchange median areas.

Breeding habitat for SFGS requires a breeding prey base of CRLF or Pacific tree frogs. Most aquatic areas in and near the BSA are estuarine, which renders them generally unsuitable for CRLF and Pacific tree frogs, both preferred prey species for SFGS. In January 2010, two aquatic areas were identified that could at times provide marginal potential CRLF breeding habitat, although there is no indication that CRLF are using these or any other features in the BSA for breeding. Other potential SFGS prey such as Pacific tree frogs were not observed in field surveys. The closest documented breeding population of CRLF is approximately 0.20 mile northwest, and outside of, the BSA. As a result, the BSA is not considered to provide the habitat elements essential to support SFGS breeding.

The areas that provide marginal potential aquatic habitat and potential upland habitat for CRLF are considered to provide marginal potential aquatic foraging habitat and potential upland dispersal habitat for SFGS (see Figure 2.17-1). No other potential habitat for SFGS was identified.

As discussed above in the "California Red-Legged Frog" subsection, sightings of CRLF—a prey species for SFGS—have been reported within 0.10 mile of the BSA, and a CRLF breeding population has been documented within 0.20 mile of the BSA. No SFGS have been reported at either of these locations, which are separated from the nearest SFGS occurrence by movement barriers including roadways with heavy vehicular traffic and industrial and commercial parcels with extensive pavement and minimal vegetative cover. There are no continuous roadway shoulders or drainages that would provide connectivity between the nearest SFGS occurrence and the CRLF sighting locations or CRLF breeding population outside of the BSA.



URS Corp - Oakland CA - B Jacobsen 1/5/17 emc2/digital/Project/US101/Broadway_SMTA_2646509/Map/NEIS/Figure_10_potential_special_status_species.mxd - 3/19/2016 @ 8:03:45 AM

+ 400
 Route stationing

Biological Study Area

Permanent impacts

Temporary impacts

Exclusion fencing for California red-legged frog (CRLF) and San Francisco garter snake (SFGS)

Aquatic habitat: CRLF breeding

Aquatic habitat: CRLF foraging and dispersal, SFGS foraging

Upland habitat: CRLF and SFGS dispersal

Salt marsh habitat: California clapper rail foraging, California black rail, salt marsh harvest mouse

0 250 500 FEET

Imagery source: San Mateo County, 2005

US 101/BROADWAY INTERCHANGE
 RECONSTRUCTION PROJECT
 BURLINGAME, CA
 EA 235840

Figure 2.17-1
**POTENTIAL SPECIAL-STATUS SPECIES HABITAT
 IN THE BIOLOGICAL STUDY AREA**

California Black Rail

No California black rail occurrences have been documented in the BSA. The nearest CNDDDB occurrence was recorded in Foster City in 1972, approximately 5.7 miles from the BSA. The species was not observed during habitat assessments in the BSA.

California black rails are shy, secretive birds that need a dense pickleweed canopy for escape cover. The species favors large marshes that are close to water, away from urban areas, and saline to brackish with a high proportion of pickleweed, gumplant, alkali bulrush, rushes, and cattails (Spautz et al. 2005).

The species is not expected to be present in the BSA. The BSA is exposed to constant vehicular traffic and lacks dense pickleweed for escape cover. Poor to marginal potential habitat is present along the unnamed drainage channel between Bayshore Highway and the San Francisco Bay near Airport Boulevard (Figure 2.17-1). The channel provides few of the habitat elements favored by California black rail. The channel is close to the Bay but not large (approximately 0.12 acre). The channel is immediately adjacent to a gas station, busy roadways, and other urban development. The narrow channel banks are vegetated with sparse, short stands of pickleweed, alkali heath, marsh gumplant, and extensive nonnative iceplant. No rushes or cattails are present in or along the channel.

Although breeding populations are uncommon in the South Bay, the northern extent of the Burlingame Lagoon (a segment known as Sanchez Marsh; outside of the BSA) has vegetation characteristics that would provide potential habitat for California black rail.

California Clapper Rail

There are no documented occurrences of California clapper rail in the BSA. The nearest CNDDDB occurrence was a 1975 record for a small California clapper rail population along San Francisco Bay between the mouths of Mills and Easton Creeks, outside of the BSA. Historical aerial photography indicates the presence of potential habitat for California clapper rail in the Bay near the mouth of Easton Creek, which is more than 500 feet east of the BSA; however, *Spartina* sp. and other vegetation in this area has been removed during efforts by the San Francisco Estuary Invasive *Spartina* Project (SFEISP) to eradicate the nonnative *Spartina* hybrid (SFEISP 2008).

Between 2006 and 2008, the SFEISP conducted annual protocol-level surveys for California clapper rails at the mouth of Easton Creek, in the Burlingame Lagoon (adjacent to the southern boundary of the BSA), and at the mouth of Mills Creek (immediately north of the BSA). No clapper rails were observed at Easton Creek or

Burlingame Lagoon, and the SFEISP concluded that there were no California clapper rails in either area (SFEISP 2006, 2007, 2008). In 2007, SFEISP documented the presence of one or two California clapper rails at the mouth of Mills Creek (SFEISP 2007); however, after the 2008 survey, SFEISP concluded that the species is no longer present in the area (SFEISP 2008).

No nesting habitat for California clapper rail was identified during field surveys in the BSA. The brackish areas lack the dense pickleweed and *Spartina* sp. cover required for clapper rail nesting.

Poor to marginal potential foraging habitat is present along the unnamed drainage channel between Bayshore Highway and the San Francisco Bay near Airport Boulevard (Figure 2.17-1). No *Spartina* sp. is present in or along the channel. The narrow channel banks are vegetated with sparse, short stands of pickleweed, alkali heath, marsh gumplant, and extensive iceplant. The channel is immediately adjacent to a gas station and constant vehicular traffic and offers no protection or isolation from predators. As a result of these factors, the species is not expected to use the channel for foraging.

The nearest areas of potential nesting habitat for California clapper rail are outside of the BSA at the mouth of Mills Creek and in the Burlingame Lagoon. Those locations, and potentially San Francisco Bay near the mouth of Easton Creek, also offer potential foraging habitat.

The BSA is within the Central/South Bay Recovery Unit of the USFWS *Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (USFWS 2010a). The plan recommends acquisition and protection of tidal marshes east of the BSA for California clapper rail and other species.

Salt Marsh Harvest Mouse

There are no records of salt marsh harvest mouse occurrences in the BSA. The nearest CNDDDB record for a salt marsh harvest mouse dates from 1960 and is more than 6 miles to the southeast, in Foster City. A number of trapping efforts, catalogued by the San Francisco Estuary Institute, have been conducted in the southern Bay Area to identify populations of salt marsh harvest mice (SFEI 2008). In 1998, an individual was trapped approximately 4 miles southeast of the southern extent of the BSA. In 1999, unsuccessful attempts were made to trap salt marsh harvest mice at Seal Point Park, approximately 3 miles southeast of the BSA. Seal Point Park is the closest location to the BSA where trapping was attempted (SFEI 2008).

The maximum distance the salt marsh harvest mouse has been observed to move through brackish or freshwater marsh vegetation cover is approximately 656 feet (Shellhammer et al. 1982, H.T. Harvey & Associates 2005). Salt marsh harvest mice have not been documented to move more than 16.4 feet across water or bare ground (Bias 1994; Geissel et al. 1988). Therefore, the BSA is well beyond the maximum movement range from any known occurrences.

The BSA lacks the dense pickleweed cover associated with species use. Poor to marginal potential habitat is present along the unnamed drainage channel between Bayshore Highway and the San Francisco Bay near Airport Boulevard (Figure 10). The narrow channel banks have sparse, short stands of pickleweed interspersed with other vegetation (alkali heath, marsh gumplant, and iceplant). Because of the marginal amount and quality of vegetation, lack of contiguity with dense pickleweed stands, and distance from known occurrences, the salt marsh harvest mouse is not expected to use the channel for cover, foraging, or nesting.

The BSA is within the Central/South Bay Recovery Unit of the USFWS *Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (USFWS 2010a). The plan recommends acquisition and protection of tidal marshes east of the BSA for salt marsh harvest mouse and other species.

2.17.3. Environmental Consequences

California Seablite

The rare plant surveys did not detect California seablite within the BSA, and natural populations of the species are presumed to be extirpated from the Bay Area. The only marginally suitable potential habitat is along the narrow banks of the unnamed drainage channel. If the project restores the conveyance capacity of the channel (see Section 1.3.1.6), sediment and berm removal and related activities would have a temporary direct impact on an estimated 0.12 acre (5,066.78 square feet) of marginal potential habitat for California seablite. The species has been determined to be absent from the BSA and from the area with marginal potential habitat. The project will have no effect on California seablite.

Southern DPS Green Sturgeon

The southern DPS green sturgeon has a low potential to occur in Easton and Sanchez creeks in the BSA. With implementation of the general avoidance and minimization measures listed in Section 2.16.4.2 and the conservation measures listed in Section 2.17.4, the proposed project will not have an adverse effect on the species.

The proposed project will extend the US 101 culvert over Easton Creek by 42 feet. This concrete box culvert will be constructed in an existing concrete-lined channel. The resulting habitat modification will have an insignificant effect on the creek's potential habitat value for this species. When completed, the culvert extension will not affect the species' ability to pass through the project area.

Installation of the cofferdams will temporarily prevent green sturgeon from moving upstream of the construction area. The portion of Easton Creek in the BSA, both upstream and downstream of the culvert extension, is a straightened channel with hardened banks that provides little habitat value for this species. As a result, this temporary exclusion will not prevent the species from using foraging or rearing habitat upstream of the temporary cofferdams, and will have a discountable effect on habitat availability.

The project may cause a temporary and localized increase in water turbidity during installation and removal of the cofferdams in Easton Creek. A temporary, localized increase in turbidity could also occur if sediment and berm removal activities are conducted in the unnamed drainage channel. However, green sturgeon commonly encounter increased turbidity during storm runoff events and as a result of wind and wave action. As a result, the effects of increased turbidity on green sturgeon, if the species is present, will be insignificant and discountable. The project may affect, but is not likely to adversely affect, southern DPS green sturgeon.

Critical Habitat for Southern DPS Green Sturgeon

The extension of the Easton Creek culvert by 42 feet will take place in designated critical habitat for the green sturgeon. The culvert extension will have a permanent effect on 0.02 acre of critical habitat. This impact is anticipated to be minor because the culvert extension will take place in an existing concrete-lined channel segment that lacks primary constituent elements (PCEs)¹⁶ for green sturgeon.

The culvert extension may also cause a temporary localized increase in water turbidity within designated critical habitat in Easton Creek and San Francisco Bay. The estuarine component of this designated critical habitat unit often experiences increased turbidity naturally as a result of storm runoff and wind and wave action. If drainage work is required in the unnamed channel, which is not within designated

¹⁶ PCEs are physical or biological features that are essential to the conservation of a species, such as space for individual and population growth and for normal behavior. The Natural Environment Study (URS 2010b) provides an overview of PCEs for southern DPS green sturgeon in Section 4.5.1. For a full list of PCEs, see NOAA 2009a.

critical habitat, construction sediment or other materials could flow into San Francisco Bay. Implementation of avoidance, minimization and conservation measures, in concert with the contractor's compliance with the SWPPP, CWA Section 401 certification, CDFG Section 1602 Agreement, and/or CWA Section 404 permit, will minimize these temporary and localized effects.

Impacts to critical habitat from extending the Easton Creek culvert are not expected to affect the survival or recovery of the southern DPS green sturgeon. The project may affect, but is not likely to adversely modify or destroy, designated critical habitat for southern DPS green sturgeon.

Central California Coast Steelhead DPS

The project will have no effect on CCC steelhead. No impacts to spawning populations of steelhead or any other anadromous fish are anticipated because of the lack of suitable spawning habitat. In-stream structures, undercut banks, and deep pools that could provide resting habitat are absent from the creek segments in the BSA. The proposed project avoids construction at Sanchez Creek, and construction at Easton Creek will be limited to extending the existing culvert. The reach of Easton Creek in the BSA is confined to an underground culvert and a straight, concrete-lined channel that is too narrow and disturbed to support salmonids (Winzler and Kelly 2009).

If a CCC steelhead individual or any other anadromous salmonid were to stray into the BSA, the general avoidance and minimization measures in Section 2.16.4.2 will prevent adverse impacts to the species. Implementation of standard Department BMPs for erosion control and spill prevention will prevent habitat loss or degradation during construction.

California Red-Legged Frog

If CRLF are present in the BSA during construction, take under FESA could occur in the form of harm, harassment, injury, and mortality from habitat loss and degradation, construction-related disturbance, and capture and relocation. Figure 2.17-1 depicts the areas of temporary and permanent impacts to potential aquatic and upland habitat for CRLF.

Constructing the northbound US 101 on-ramp, southbound US 101 off-ramp, and embankments and a retaining wall will result in permanent impacts to an estimated 0.01 acre of potential aquatic breeding habitat, 0.29 acre of potential aquatic dispersal and foraging habitat, and 1.53 acre of potential upland dispersal habitat. Temporary direct effects to an estimated 0.01 acre of potential aquatic breeding habitat, 0.10 acre of potential aquatic dispersal and foraging habitat, and 0.38 acre of potential upland

dispersal habitat could result from the use of US 101 shoulder areas for construction access and from the culvert extension at Easton Creek.

Project-related indirect effects could include increased erosion and sedimentation from disturbance to upland areas and removal of vegetation, which could affect potential CRLF aquatic and upland habitat outside of the project footprint. With implementation of the erosion control and restoration/revegetation measures described in Section 2.16.4.2 and the project landscaping plan, these effects would be temporary and insignificant. The project is likely to adversely affect, but not jeopardize, CRLF.

San Francisco Garter Snake

SFGS are not expected to be present in the BSA. Constructing the northbound US 101 on-ramp, southbound US 101 off-ramp, and embankments and a retaining wall will result in permanent impacts to an estimated 0.30 acre of potential aquatic foraging habitat and 1.53 acre of potential upland dispersal habitat for SFGS. Temporary direct effects to an estimated 0.11 acre of potential aquatic foraging habitat and 0.38 acre of potential upland dispersal habitat could result from the use of US 101 shoulder areas for construction access and from the culvert extension at Easton Creek. Effects to the species from habitat disturbance would be discountable because of the absence of recorded SFGS occurrences, the lack of connectivity with the closest occurrence, and the distance between the closest occurrence and the BSA (1.70 mi, compared with the species' dispersal range of 0.60 mi). Indirect effects to potential SFGS aquatic and upland habitat outside of the project footprint would be the same as those described above for CRLF. The project is not likely to adversely affect SFGS.

California Black Rail

No permanent impacts to California black rail will occur. If the project restores the conveyance capacity of the unnamed drainage channel (see Section 1.3.1.6), sediment and berm removal and related activities will have a temporary direct impact on an estimated 0.12 acre (5,066.78 square feet) of poor to marginal potential habitat for the California black rail. No other potential habitat for the species was identified in the BSA.

Temporary project construction noise is not expected to result in indirect impacts to California black rails. As described in Section 2.16.3.1, pile driving noise will diminish to ambient highway noise levels within 400 feet or less of the pile driving locations. The closest pile-driving location is approximately 700 feet from potential

California black rail habitat in the Burlingame Lagoon (Department 2009f).

Temporary pile-driving noise is expected to have a discountable effect on the species and any potential nesting habitat in the Burlingame Lagoon.

California Clapper Rail

No permanent impacts to California clapper rail will occur. If the project restores the conveyance capacity of the unnamed drainage channel (see Section 1.3.1.6), sediment and berm removal and related activities would have a temporary direct impact on an estimated 0.12 acre (5,066.78 square feet) of poor to marginal potential foraging habitat for the California clapper rail. The species is not expected to use the channel for foraging because of the marginal quantity and quality of suitable vegetation and the proximity to human and vehicular traffic.

Temporary construction noise is not expected to result in indirect impacts to California clapper rail if they are present outside of the BSA. As described in Section 2.16.3.1, noise from pile-driving and other loud construction activities will diminish to levels that will not harm birds within approximately 400 feet of the noise source. The potential nesting habitat for California clapper rail at the mouth of Mills Creek is more than 2,000 feet from the nearest pile-driving locations. The potential nesting habitat in the northern extent of the Burlingame Lagoon (known as Sanchez Marsh) is approximately 700 feet from the closest pile-driving locations. California clapper rails are not known to nest in either location, and at these distances, no masking effects or nest abandonment will occur. Potential foraging habitat outside of the BSA, such as in San Francisco Bay near the mouth of Easton Creek, is approximately 900 feet from the closest pile-driving locations. Temporary pile-driving noise is expected to have a discountable effect on the species. The project may effect, but is not likely to adversely affect, California clapper rail.

Salt Marsh Harvest Mouse

If the project restores the conveyance capacity of the unnamed drainage channel (see Section 1.3.1.6), sediment and berm removal and related activities would have a temporary direct impact on an estimated 0.12 acre (5,066.78 square feet) of poor to marginal potential habitat for the salt marsh harvest mouse. The species is not expected to use the channel because of the marginal amount and quality of vegetation, lack of contiguity with dense pickleweed stands, and distance from known occurrences. The channel is also beyond the species' known dispersal range from potential habitat outside of the BSA. Therefore, the salt marsh harvest mouse is not expected to be present. The project would have no effect on salt marsh harvest mouse.

2.17.4. Avoidance, Minimization, and/or Mitigation Measures

California black rail, California clapper rail, and salt marsh harvest mouse are not anticipated to be present; therefore, no avoidance and minimization measures are proposed for those species. The general construction measures listed in Section 2.16.4.2 and the following species-specific conservation measures would avoid or minimize effects to threatened and endangered species and critical habitat.

California Seablite

The field survey and review of recorded occurrences indicate that this species is absent from the BSA. A qualified botanist will conduct a focused preconstruction survey for California seablite during the blooming period for the species (July to October) in 2013. In the event that the species is identified in the BSA during the focused preconstruction survey, the USFWS will be contacted for guidance on exclusion buffers, and additional avoidance and minimization methods will be determined through supplemental consultation.

Southern DPS Green Sturgeon

The project design incorporates cofferdam installation requirements, Department BMPs for storm water pollution prevention, and the general avoidance and minimization measures listed in Section 2.16.4.2, which will reduce potential effects to this species. In addition, the following conservation measures are proposed to further avoid and minimize effects:

- All in-stream work in Easton Creek (and, if necessary, the unnamed drainage channel) will take place during the dry season (April 15 through October 15) to minimize effects on creek flows and reduce the potential for sedimentation.
- The cofferdams required for work at Easton Creek will be installed during low tide, when green sturgeon will not be present. This will also prevent green sturgeon from being trapped above the cofferdams.
- Only clean gravel or sand fill will be used for construction of the cofferdams.
- A NOAA Fisheries-qualified biological monitor will be present during installation and removal of the cofferdams to ensure that impacts to Easton Creek and downstream waters are minimized.
- If work in the unnamed drainage channel is necessary, all construction activities will take place during low tide.

Critical Habitat for Southern DPS Green Sturgeon

The project design incorporates cofferdam installation requirements and Department BMPs for storm water pollution prevention. The measures outlined in Section 2.16.4.2 and the conservation measures for southern DPS green sturgeon will also avoid and minimize effects to critical habitat for the species. No additional measures are proposed.

Central California Coast Steelhead DPS

The general measures for work in waterways described Section 2.16.4.2 will minimize impacts to aquatic species. No additional avoidance and minimization measures for CCC steelhead are necessary.

California Red-Legged Frog

The Department will implement the following precautionary measures, as well as the general measures described in Section 2.16.4.2, to avoid or minimize impacts to the CRLF and its potential habitat.

- Exclusion fencing such as Ertec E-fence™ or an equivalent will be installed prior to any construction during the dry season (April 15 through October 15), when CRLF are not actively dispersing or foraging to prevent unintentional entrapment within the BSA. Exclusion fencing will be installed in the areas shown in Figure 10 to ensure a complete barrier to prevent CRLF from entering the BSA.
- To prevent CRLF from becoming entangled or trapped in erosion control materials, plastic monofilament netting (erosion control matting) or similar material will not be used for erosion control. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.
- A USFWS-approved biologist will conduct preconstruction surveys before any ground-disturbing activities take place in potential CRLF habitat. The survey will consist of walking transects while conducting visual encounter surveys in areas that will be subject to vegetation clearing, grubbing, grading, cut and fill, or other ground disturbing activities. If CRLF are found during the preconstruction survey, the USFWS will be contacted immediately, and work in the area will cease until the individual(s) are relocated to a suitable site in conformance with approved USFWS protocol.
- After vegetation removal in potential CRLF habitat, a USFWS-approved biologist will be on call as needed to monitor construction activities in potential habitat and inspect the exclusion fencing to ensure that it remains intact throughout the duration of construction. Through communication with the Resident Engineer or

their designee, the biologist may stop work if deemed necessary for any reason to protect CRLF and will advise the Resident Engineer or designee on how to proceed accordingly. If a CRLF is found, work will be halted and the USFWS will be notified immediately. Work in the area will not resume until the individual(s) are relocated by the USFWS-approved biologist to a suitable site in conformance with approved USFWS protocol.

San Francisco Garter Snake

SFGS are not expected to be present in the BSA; however, the first two measures proposed for CRLF above, as well as the general measures described in Section 2.16.4.2, will avoid or minimize impacts to marginal potential habitat for SFGS. The following preconstruction survey and construction monitoring measures will also be implemented to avoid direct or indirect effects to SFGS.

- A CDFG/USFWS-approved biologist will conduct preconstruction surveys before any ground-disturbing activities take place in potential SFGS habitat. These surveys will consist of walking transects while conducting visual encounter surveys in areas that will be subject to vegetation clearing, grubbing, grading, cut and fill, or other ground-disturbing activities. If an SFGS is observed during a survey, the USFWS and CDFG will be notified, and the SFGS will be monitored until it leaves the area on its own accord.
- After vegetation removal in potential SFGS habitat, a CDFG/USFWS-approved biologist will be on call as needed to monitor construction activities in potential habitat and inspect the exclusion fencing to ensure that it remains intact throughout the duration of construction. Through communication with the Resident Engineer or their designee, the biologist may stop work if deemed necessary for any reason to protect SFGS and will advise the Resident Engineer or designee on how to proceed accordingly.

2.18. Invasive Species

This section is based on the *Natural Environment Study* (URS 2010c) for the proposed project, which was completed in April 2010.

2.18.1. Regulatory Setting

On February 3, 1999, President Clinton signed Executive Order 13112 requiring Federal agencies to combat the introduction or spread of invasive species in the

United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” FHWA guidance issued August 10, 1999, directs the use of the State’s noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

2.18.2. Affected Environment

The BSA supports a number of nonnative species. Some are invasive (that is, species that are not indigenous to the area where they are found and adversely affect the habitat in that area) and some are not invasive. Invasive species in the BSA are those designated as high risk by the California Invasive Plant Council. These species include pampas grass (*Cortadeira selloana*), English ivy (*Hedera helix*), and sweet fennel (*Foeniculum vulgare*). Bunches of pampas grass and small stands of sweet fennel are established along both sides of US 101. English ivy grows extensively throughout the BSA on both sides of US 101, into the canopies of large eucalyptus trees, in the understory of the eucalyptus stand along the north side of Bayside Park, and within the medians of the Broadway overcrossing.

Species in the BSA that are nonnative but not invasive include multiple callistemon (bottle brush) and melaleuca (paper bark) trees that were planted along the Bay Trail at the eastern extent of the BSA and extensive stands of nonnative Tasmanian blue gum eucalyptus that were planted along US 101 and around Bayside Park adjacent to Airport Boulevard.

2.18.3. Environmental Consequences

None of the identified species on the California list of noxious weeds is currently used by the Department for erosion control or landscaping. However, project construction activities could have the potential to inadvertently spread these species.

2.18.4. Avoidance, Minimization, and/or Mitigation Measures

In compliance with the Executive Order on Invasive Species, EO 13112, and subsequent guidance from the Federal Highway Administration, the landscaping and erosion control included in the project will not use species listed as noxious weeds. The following measures will also reduce the spread of invasive nonnative plant

species and minimize the potential for construction disturbance to decrease palatable vegetation for wildlife to the greatest degree possible:

- No disposal of soil and plant materials should be allowed from areas that support invasive species to areas dominated by native vegetation;
- Resident Engineers should be educated on weed identification and the importance of controlling and preventing the spread of identified invasive nonnative species; and
- Gravel and/or fill material to be placed in relatively weed-free areas should come from weed-free sources. Certified weed-free imported materials (or rice straw in upland areas) will be used.

Cumulative Impacts

2.19. Cumulative Impacts

2.19.1. 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 considers 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 project, such as changes in community character, traffic patterns, housing availability, and employment.

Section 15130 of the CEQA Guidelines describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA appears in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts under NEPA appears in 40 CFR Section 1508.7 of the Council on Environmental Quality Regulations.

2.19.2. Projects Considered for Cumulative Impacts

A list of nearby projects was developed to evaluate the potential for cumulative impacts. The list includes projects that the City of Burlingame Planning Division identified as being under review or recently approved as of June 22, 2010. The Governor's Office of Planning and Research CEQAnet database was also reviewed to identify projects for which notices of preparation or completion of an environmental document were filed with the State Clearinghouse. In addition, publicly available

information from the Department, Caltrain, and the California High Speed Rail Authority was reviewed to identify transportation projects that have the potential to contribute to cumulative impacts.

The study area for the cumulative impacts assessment was approximately 1 mile from the project limits for private development and nontransportation project and approximately 3 miles from the project limits for transportation projects. The cumulative impacts assessment considered conceptual, planned, and recently completed projects.

2.19.2.1. Private Development and Nontransportation Projects

The following briefly summarizes the nature and status of the private development and nontransportation projects identified to consider for cumulative impacts. State Clearinghouse reference numbers (SCH #) are included where available.

- **Addition to Existing Commercial Building, 1801 Adrian Road, Burlingame.** A 60,929-square-foot second floor would be added to an existing commercial building. The project application was submitted in September 2009, and the project is in the initial review stage.
- **Office/Life Science Campus, 350 Beach Road, Burlingame.** The proposed complex would construct two five-story buildings, one seven-story building, and one eight-story building with a total of 730,000 square feet of floor space. In addition, a two-story, 37,000-square-foot building would include a child care facility, an exercise facility and a café/break room. Parking would be provided in a five-story parking structure and other locations. The project application was submitted in April 2010, and the project is in the initial review stage.
- **18-Unit Residential Condominium, 556 El Camino Real, Burlingame.** A new four-story condominium would replace a structure containing 14 apartment units. The project application was submitted in August 2006. When the application is deemed complete, an environmental scoping meeting will be scheduled with the City of Burlingame Planning Commission.
- **Nine-Unit Residential Condominium, 1512-1516 Floribunda Ave., Burlingame.** A new four-story condominium replaced one single-family home and a four-unit residential building. This project was approved in 2005 and construction is complete.
- **45-Unit Residential Condominium, 1840 Ogden Drive, Burlingame.** A new four-story condominium would replace a one-story office building. This project was approved on July 24, 2006, and construction is in progress.

- **20-Unit Residential Condominium, 1441-1445 Bellevue Ave., Burlingame (SCH #2005042032).** A new four-story condominium would replace five multifamily residential buildings containing a total of 18 units. This project was approved on January 8, 2007; a building permit had not been issued as of August 24, 2010.
- **25-Unit Residential Condominium, 1800 Trousdale Drive, Burlingame.** A new seven-story condominium would replace a one-story office building. This project was approved on April 16, 2007; a building permit had not been issued as of August 24, 2010.
- **Nine-Unit Residential Condominium, including 1 affordable unit, 1226 El Camino Real, Burlingame (SCH #2008032007).** A new four-story condominium will replace four apartment buildings containing a total of 12 units. This project has been constructed.
- **Safeway store and two-story retail/office building, 1450 Howard Ave., Burlingame (SCH #2009112043).** This commercial/institutional project would replace the existing Safeway and Walgreens stores with a new 44,982-square-foot store with a 6,865-square-foot mezzanine and a two-story building with 18,739 square feet total. The project application was approved in February 2010, and the applicant is applying for building permits.
- **Remodel and addition to existing building for proposed office use, 1427 Chapin Ave., Burlingame.** This commercial/institutional project demolished several accessory structures, remodeled the interior of an existing two-story building, and constructed a two-story addition. This project was approved on April 24, 2006, and construction is complete.
- **79-unit assisted living facility, 1818 Trousdale Dr., Burlingame.** This commercial/institutional project consists of a new four-story structure with below-grade parking that will replace a one-story office building. This project was approved on July 10, 2006, and construction is under way.
- **Remodel of existing building and construction of new building, 1450 Rollins Rd./20 Edwards Ct., Burlingame (SCH #2006022081).** This property would be used as a veterinary/rehabilitation, adoption, education, and retail facility for Peninsula Humane Society and SPCA. This project's Environmental Impact Report was certified on June 18, 2007, and construction is in progress.
- **New retail building, 260 El Camino Real, Burlingame (SCH #2008082083).** This project would replace a gas station with a 13,755-square-foot, one-story structure with a mezzanine. The project has been constructed.

- **1616 Rollins Road and 1625 Adrian Road Creek Enclosure Project (SCH #2009032095).** The proposed project would convert a DHL shipping distribution center to a BMW automobile service center. The existing front building would be converted to a customer service center and offices and the rear building would be converted to service bays, warehouse, offices and a lunchroom. The project activities would include installing an open-bottom concrete culvert and constructing a road crossing across the drainage channel to connect the property to additional parking areas located to the southwest. The project would also install a storm water treatment system to remove pollutants from runoff before entering the drainage channel. A Notice of Determination was submitted on August 10, 2009.
- **Burlingame High School Expansion, Arsenic Removal Action Workplan (SCH #2008018078).** This project involves the Department of Toxic Substances Control's approval of a Removal Action Workplan for the Burlingame High School Expansion. The workplan addresses the excavation and off-site disposals of soils contaminated with arsenic. A notice of exemption was received on January 1, 2008.
- **1510 Rollins Road (SCH #2007102079).** This project paved an existing unpaved area within a drainage easement for supplemental parking for employees working on the property, added new fencing within the drainage easement, and made tenant improvements to the interior of the existing office/warehouse building. A Mitigated Negative Declaration was filed with the State Clearinghouse on October 15, 2007. Construction was completed as of January 2010.
- **Easton Creek-Marsten Pump Station Addition and Outfall Pipeline Project, Burlingame (SCH #2005052091).** The City of Burlingame is constructing a three-phase series of storm water drainage improvements in and near Easton Creek to alleviate chronic flooding in the area. The improvements are scheduled for completion in 2011.
- **City of Burlingame Annual Creek and Channel Facility Maintenance Program (SCH #2008122013).** The City of Burlingame will perform ongoing maintenance at Burlingame, Sanchez, Easton, Mills and El Portal creeks annually for a total of 5 years. The maintenance activities will include removal of accumulated sediment, debris, and nonnative vegetation, and cutting or mowing vegetation in and around the channels. A Mitigated Negative Declaration was filed with the State Clearinghouse on December 3, 2008.

2.19.2.2. Transportation Projects

- **US 101 Auxiliary Lanes Project, Third Ave. to Millbrae Ave., San Mateo County (SCH #2003072150).** Construction is being completed for auxiliary lanes between Third and Millbrae Avenues along northbound and southbound US 101, the Peninsula Avenue overcrossing, the Monte Diablo pedestrian/bicycle overcrossing, a pedestrian/bicycle overcrossing south of the US 101/Broadway interchange (now finished), and retaining walls and soundwalls. The project was approved on June 8, 2006, and construction is scheduled for completion in spring 2011.
- **Carolan Avenue Bike Route Project, Burlingame.** This project would provide a dedicated Class III bike route with signs along approximately 1 mile of Carolan Avenue between North Lane and Broadway. The project was approved and will be constructed before 2013.
- **Broadway Pedestrian/Bicycle Bridge Connections Project, Burlingame.** This project would construct standard sidewalks, curb ramps, crosswalks, and signs at both ends of the pedestrian overcrossing. The project was approved and will be constructed before 2013.
- **Caltrain Burlingame Station Improvement, Burlingame.** This project included a range of improvements including improved accessibility and remodeling of the Morrell Avenue crossing north of the station. The design included a pedestrian plaza, enhanced landscaping, wider sidewalks, custom shelters and new station fencing. This project was approved and construction was completed in June 2008.
- **San Mateo County Grade Crossing Improvement Project, Burlingame and other cities.** This project would improve 25 Caltrain at-grade crossings in San Mateo County, including at Broadway, Oak Grove Avenue, and Peninsula Avenue in Burlingame. Improvements would include more clearly marked pedestrian crossings with fencing and gates, improved sidewalks and pavement markings, and roadway medians. Construction is under way and is scheduled to continue through 2010.
- **California High Speed Train, San Francisco to San Jose Section (SCH# 2008122079).** This proposed project is for a segment of the future high-speed train service proposed by the California High Speed Rail Authority. The project would use the Caltrain rail right-of-way between San Francisco and San Jose and would include stations at the San Francisco Transbay Terminal, SFO, Millbrae, either Redwood City or Palo Alto, San Jose, and Gilroy. The environmental review process for this segment of the high-speed rail project was initiated in December 2008, and preparation of an EIS/EIR is in progress. In April 2009,

Burlingame city officials requested that the Burlingame segment of the trackway be placed in a tunnel to avoid creating a physical barrier through the community.

2.19.3. Environmental Consequences

The projects listed above were considered together with the proposed US 101/Broadway Interchange Reconstruction Project for the potential for cumulative impacts. The potential impacts are described by resource area below.

2.19.3.1. Land Use and Community Resources

A number of the recently completed and proposed projects added or will add residential units or commercial/retail establishments to the US 101/Broadway Interchange Reconstruction Project vicinity. The projects were reviewed for location, timing, and available information on potential environmental impacts. None of these projects overlap geographically or combine with the proposed interchange improvements to create adverse cumulative impacts for land use or community resources.

Two proposed projects would affect the Caltrain tracks that cross Broadway between Carolan Avenue and California Drive: the San Mateo County Grade Crossing Improvement Project (scheduled for 2009–2010) and the California High Speed Train, San Francisco to San Jose Section (SCH# 2008122079; construction date unknown and environmental scoping is in progress). As the construction periods for these projects would not overlap with those of the US 101/Broadway project, short-term disruptions or detours from each project would not result in cumulative effects to community cohesion.

2.19.3.2. Traffic and Transportation

The transportation analysis for the US 101/Broadway Interchange Reconstruction Project included growth projections through 2035 from Association of Bay Area Governments forecasts (Section 2.4.2.2). The majority of residential projects included in the cumulative list of projects replace existing multifamily structures. The list identifies less than 200 additional residential units (79 of them in one assisted-living facility) that have recently been added or are planned for construction in the cumulative impact study area. The additional traffic from the new residential units will be distributed over the local roadway system, are within the 2035 growth forecasts used for the traffic analysis, and would not change the conclusions of the transportation analysis.

The US 101 Auxiliary Lanes Project is scheduled for completion in spring 2011. The project would reduce congestion from merging and weaving conflicts and improve overall system performance along US 101 between San Mateo and Burlingame. Although the US 101 Auxiliary Lanes Project overlaps geographically with the US 101/Broadway project, it will be completed before the US 101/Broadway project and would not result in cumulative construction impacts or other traffic impacts.

Two City of Burlingame projects—the Carolan Avenue Bike Route Project and the Broadway Pedestrian/Bicycle Bridge Connections Project—would improve bicycle and pedestrian access in the vicinity of the US 101/Broadway interchange (see Sections 2.4.2.3 and 2.4.3.3). Both projects will be completed before construction of the US 101/Broadway project begins. The US 101/Broadway project footprint would overlap with the area of the Broadway Pedestrian/Bicycle Bridge Connections Project but would preserve or reconstruct the proposed access improvements. No cumulative construction impacts or bicycle and pedestrian access impacts would occur.

As described in Section 2.19.3.1, two proposed projects would affect the Caltrain tracks that cross Broadway. No cumulative traffic impacts would occur from the San Mateo County Grade Crossing Improvement Project; it would improve pedestrian and vehicle access across the at-grade crossing at Broadway and would be completed before the US 101/Broadway project.

The California High Speed Train, San Francisco to San Jose Section (SCH #2008122079) is at a conceptual design stage. If the High Speed Train project were to rely on the existing Caltrain tracks and at-grade local street crossings, the increase in “gate down time” would exacerbate the slight increase in delays that are projected at the Broadway/Carolan Avenue and Broadway/California Drive intersections in 2035 from the US 101/Broadway project. Operating high-speed trains on an at-grade track through an urban intersection could pose substantial safety risks, and as stated in Section 2.19.2.2, the City of Burlingame requested that the trackway be placed in a tunnel. For these reasons, the High Speed Train project would be unlikely to use the existing at-grade crossing of Broadway. Therefore, no cumulative traffic or transportation impacts are anticipated.

In addition, Caltrain and the California High Speed Rail Authority have developed a formal agreement to coordinate and implement related projects that will affect both Caltrain and the High Speed Train project (Caltrain, no date). This effort, known as the Peninsula Rail Program, would investigate a variety of trackway alignments,

including at-grade, elevated, and below-grade trench and/or tunnel. The potential exists for both the high-speed train and Caltrain to use the same grade-separated trackway, which would decrease future projected delays in the vicinity of the Broadway/Carolan Avenue and Broadway/California Drive intersections.

2.19.3.3. Visual Resources

The US 101 Auxiliary Lanes Project has already removed trees and other vegetation and introduced soundwalls, retaining walls, and vehicle barriers along the US 101 corridor in the vicinity of the Broadway overcrossing. As described in Sections 2.5.3.1 and 2.13.2.1, the US 101/Broadway project would remove approximately 71 trees, including some prominent eucalyptus trees at the interchange, and construct retaining walls up to 25 feet high at the Broadway overcrossing. The US 101 Auxiliary Lanes Project includes replacement planting and other measures to minimize project-specific impacts. The US 101/Broadway project would also include replacement planting as well as structure design measures such as surface texture treatment. No cumulative decreases to visual quality are anticipated.

2.19.3.4. Air Quality and Noise

As noted in Section 2.19.3.2, traffic changes through the year 2035 were accounted for in the traffic study for the US 101/Broadway project, which was the basis for the modeling and analysis of air quality and noise impacts. Therefore, regional and local increases in traffic have already been used to evaluate these impacts, and the local development projects fall well within the growth projections used in these studies. In addition, the 101/Broadway project is considered to meet regional air quality conformity requirements if it is included in a current TIP and RTP. The TIP and RTP undergo a cumulative transportation project, land use growth, and air quality evaluation. No long-term cumulative impacts related to air quality and noise are anticipated.

Each of the cumulative projects identified in Section 2.19.2 would have temporary air quality and noise impacts, including dust and diesel emissions from construction equipment and activities. The US 101 Auxiliary Lanes Project overlaps geographically with the US 101/Broadway project, but the Auxiliary Lanes Project would be completed at least 3 years before construction would begin at the US 101/Broadway interchange. Construction emissions would not occur at the same time, and no substantial cumulative air quality impacts are predicted.

2.19.3.5. Storm Water Runoff

Easton Creek carries storm water from the residential areas west of US 101 and the industrial area north of Broadway. Lack of creek capacity can cause flooding in the residential and industrial areas during moderate rainstorms and medium to high tides (City of Burlingame 2009). The flooding causes property damage and the closure of major roadways such as California Drive and El Camino Real, which serve as emergency access roads. The city's project consists of building a new pump station at the existing Marsten pump station site west of US 101 and installation of a 66-inch diameter discharge pipeline that parallels Easton Creek and outfalls to San Francisco Bay. The project includes construction of trash/debris collection chambers to prevent pollutants from entering the Bay. The improvements are scheduled for completion in 2011.

As described in Section 1.3.1.6, the US 101/Broadway project would replace undersized culverts and install additional inlets and new longitudinal systems to meet current drainage design requirements. The project would also implement one or more drainage modifications to eliminate the flooding around the eastern landing of the Broadway overcrossing. No cumulative impacts are anticipated.

2.19.3.6. Biological Environment

Potential for cumulative impacts to trees, jurisdictional waters, and threatened and endangered species (CRLF and SFGS) were identified and are described below.

Trees

The US 101 Auxiliary Lanes Project removed trees directly adjacent to US 101 in areas between the Millbrae Avenue interchange north of Broadway to the Third Avenue interchange to the south. The proposed US 101/Broadway project would add to the overall loss of tree habitat along the freeway corridor, although the trees are primarily nonnative species. As noted in Section 2.19.3.3, both projects include replacement planting, and the US 101/Broadway project would use native species where possible. With implementation of these measures, no long-term adverse cumulative impacts to trees are anticipated.

Jurisdictional Waters

The City of Burlingame's Easton Creek-Marsten Pump Station Addition and Outfall Pipeline Project (SCH #2005052091) and Annual Creek and Channel Facility Maintenance Program (SCH #2008122013) would overlap geographically with the US 101/Broadway project. The projects would affect Easton Creek, a potentially jurisdictional nonwetland water of the U.S., on the east side of US 101.

The Easton Creek-Marsten Pump Station Addition and Outfall Pipeline Project would place fill in Easton Creek downstream of the US 101/Broadway project BSA, between Bayshore Highway and the Bay. The fill would consist of a concrete retaining wall along the south creek bank (approximately 442 square feet of fill) and riprap to channel storm water flows (approximately 1,350 square feet of fill). The channel of Easton Creek would also be widened, and a large amount of asphalt and concrete would be removed from the channel. The city's project includes compensation and restoration measures to mitigate impacts to potentially jurisdictional waters (Winzler and Kelly 2009).

The Annual Creek and Channel Facility Maintenance Program would remove a total of approximately 150 cubic yards of silt and debris from each of two segments of Easton Creek in the US 101/Broadway BSA: the concrete box culvert under US 101, and the concrete channel between US 101 and Bayshore Highway. The project includes conservation measures for potentially jurisdictional waters (USFWS 2009c).

The US 101/Broadway project would also affect Easton Creek by extending the culvert east of US 101 by 42 feet. The culvert extension is anticipated to result in a permanent impact of approximately 528 square feet (Section 2.14.3.1, Table 2.14-2, WUS 3b). The project would either purchase compensatory mitigation for impacts to wetlands and other waters of the United States or pursue on-site restoration, enhancement, or creation of wetlands and other waters.

Each project would implement measures to conserve, compensate and/or restore the loss of jurisdictional waters from the placement of any fill in adjacent segments of Easton Creek (between US 101 and Bayshore Highway, and between Bayshore Highway and San Francisco Bay). Also, City of Burlingame projects would be completed before the US 101/Broadway begins construction. Therefore, no cumulative adverse impacts to jurisdictional waters would occur.

Threatened and Endangered Species

The following six recent or proposed projects were evaluated for their potential to contribute cumulative impacts to threatened and endangered species.

- **City of Burlingame Annual Creek and Channel Facility Maintenance Program (SCH #2008122013).** The City of Burlingame will conduct periodic maintenance in creeks in the US 101/Broadway BSA through 2014. The USFWS Biological Opinion for the maintenance program identified temporary impacts to 1.52 acres of combined CRLF/SFGS habitat along segments of Mills and Easton

creeks west of the Caltrain tracks near California Drive and anticipated take of one CRLF and one SFGS per year (USFWS 2009c). No effects to CRLF or SFGS were identified in creek segments in or adjacent to the BSA for the US 101/Broadway project, and adverse effects to California clapper rail and salt marsh harvest mouse were determined unlikely. However, maintenance activities could result in temporary increases in turbidity in designated critical habitat for southern DPS green sturgeon in Easton Creek (NOAA Fisheries 2009b). The city's project would be completed before the US 101/Broadway project begins construction; therefore, no cumulative impacts would occur.

- **1510 Rollins Road (SCH #2007102079).** This project, which is 0.10 mile northwest of the US 101/Broadway project BSA, paved an area within a drainage easement. In informal consultation, the USFWS determined that impacts to a freshwater drainage channel that may support CRLF foraging and aestivation would be avoided/minimized by use of silt fencing and a 5-foot buffer to protect channel during construction (Appendix B of TRA 2007). No cumulative impacts will occur because the project has been completed.
- **1616 Rollins Road and 1625 Adrian Road Creek Enclosure Project (SCH #2009032095).** The project, which is 0.20 mile northwest of the US 101/Broadway project BSA, will construct a concrete culvert for a freshwater drainage channel. The USFWS Biological Opinion determined that the project could result in permanent impacts to 0.053 acre of CRLF aquatic and upland dispersal habitat, harm/harassment to any individuals in the area, and mortality of one individual (USFWS 2009d). The USFWS also stated that effects to SFGS habitat would be insignificant and discountable with implementation of the project's conservation measures. Potential impacts would not spatially overlap with those of the proposed project, and the project would be completed before the US 101/Broadway project begins construction; therefore, no cumulative impacts would occur.
- **Easton Creek-Marsten Pump Station Addition and Outfall Pipeline Project, Burlingame (SCH #2005052091).** This City of Burlingame project will affect Easton Creek downstream of the US 101/Broadway project BSA, between Bayshore Highway and the Bay (see "Jurisdictional Waters," above). The Initial Study/Mitigated Negative Declaration for the project states that no CRLF impacts would occur because of the salinity of Easton Creek, existing disturbance of the creek segment, and significant barriers that prevent CRLF from moving into Easton Creek (Winzler and Kelly 2009). Therefore, this project would not result in cumulative impacts.

- **Remodel of existing building and construction of new building, 1450 Rollins Rd./20 Edwards Ct., Burlingame (SCH #2006022081).** The Peninsula Humane Society and SPCA Center for Compassion is being constructed approximately 0.1 mile west of the BSA at Rollins Road and Edwards Court. The project would not contribute impacts to CRLF because of lack of suitable habitat and barriers to movement into the site including buildings, fences, and paved areas (Impact Sciences 2006). No cumulative impacts would occur.
- **US 101 Auxiliary Lanes Project, Third Ave. to Millbrae Ave., San Mateo County (SCH #2003072150).** Construction for this project, which overlaps the US 101/Broadway BSA along the US 101 corridor, is scheduled for completion in spring 2011. In informal consultation, the USFWS stated that CRLF and SFGS were not likely to be present, and the proposed avoidance and minimization measures (preconstruction surveys, worker training, and exclusion fencing between construction activities and potential aquatic corridors) would avoid take of the species (USFWS 2003). The project would be completed before the US 101/Broadway project begins construction; therefore, no cumulative impacts would occur.

The US 101/Broadway project would not contribute cumulatively or incrementally to impacts to threatened or endangered species.

2.20. Climate Change (CEQA)

2.20.1. Regulatory Setting

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHG related to human activity that include carbon dioxide (CO₂), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with greenhouse gas emissions and climate change at the state level. Assembly Bill 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck

greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year; however, in order to enact the standards California needed a waiver from the U.S. Environmental Protection Agency (EPA). The waiver was denied by Environmental Protection Agency in December 2007 and efforts to overturn the decision had been unsuccessful. See *California v. Environmental Protection Agency*, 9th Cir. Jul. 25, 2008, No. 08-70011. On January 26, 2009, it was announced that EPA would reconsider their decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5 mpg fuel economy standard for automobiles and light duty trucks which will take effect in 2012. On June 30, 2009 EPA granted California the waiver. California is expected to enforce its standards for 2009 to 2011 and then look to the federal government to implement equivalent standards for 2012 to 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The state is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the U.S. Environmental Protection Agency (EPA) to regulate GHG as a pollutant under the Clean Air Act (*Massachusetts vs. Environmental Protection Agency et al.*, 549 U.S. 497 (2007)). The court ruled that GHG does fit within the Clean Air Act's definition of a pollutant,

and that the EPA does have the authority to regulate GHG. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting GHG emissions.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆)--in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

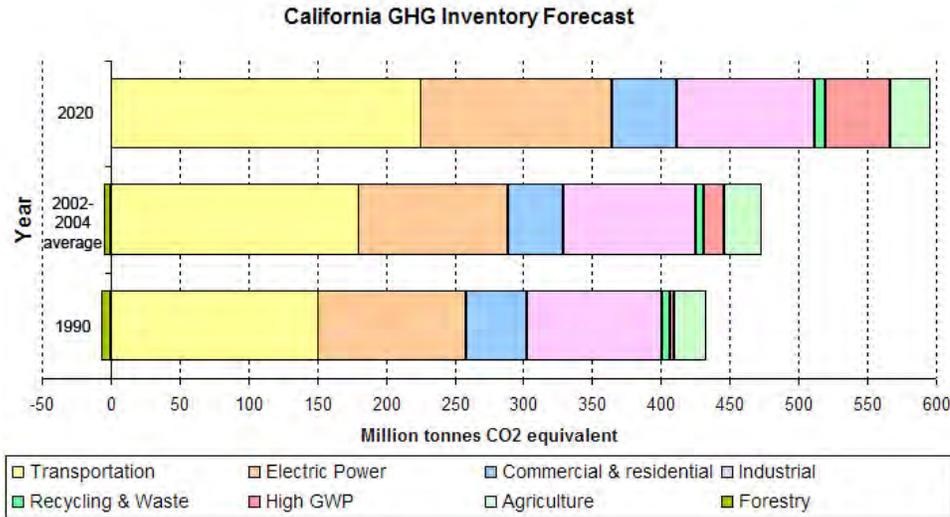
These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009.¹⁷

According to Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents (March 5, 2007), an individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of GHG. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(i)(1) and 15130. To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

¹⁷ <http://www.epa.gov/climatechange/endangerment.html>

As part of its supporting documentation for the Draft Scoping Plan, CARB recently released an updated version of the GHG inventory for California (June 26, 2008).

Shown below is a graph from that update that shows the total GHG emissions for California for 1990, 2002-2004 average, and 2020 projected if no action is taken.



From: <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>

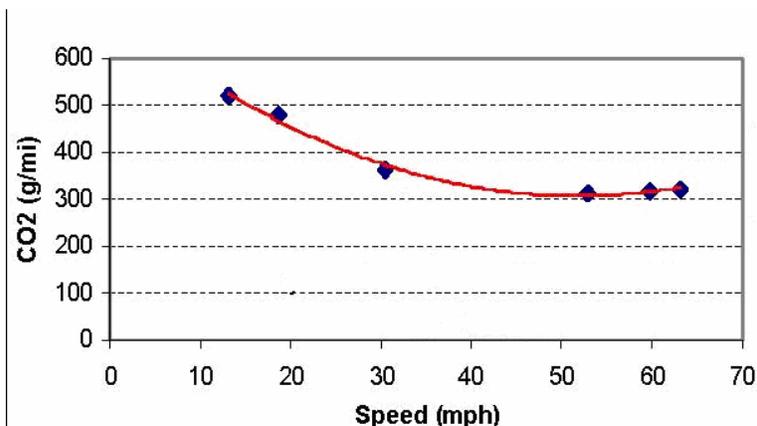
Figure 2.20-1 California Greenhouse Gas Inventory

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California’s GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation (see Climate Action Program at Caltrans (December 2006), Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006. This document can be found at: <http://www.dot.ca.gov/docs/ClimateReport.pdf>.

2.20.2. Project Analysis

One of the main strategies in the Department’s Climate Action Program to reduce GHG emissions is to make California’s transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0 to 25 miles per hour) and speeds over 55 mph; the most severe emissions occur from 0 to 25 miles per hour (see Figure 2.20-2). To the extent that a

project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors GHG emissions, particularly CO₂, may be reduced.



Source: Center for Clean Air Policy, [http://www.ccap.org/Presentations/Winkelman%20TRB%202004%20\(1-13-04\).pdf](http://www.ccap.org/Presentations/Winkelman%20TRB%202004%20(1-13-04).pdf)

Figure 2.20-2 Fleet CO₂ Emissions vs. Speed (Highway)

The project would improve traffic operations at the US 101/Broadway interchange, including adjacent ramps and intersections, and would help to reduce or avoid traffic queues that currently affect US 101 operations between East Millbrae Avenue to the north and Anza Boulevard to the south. Quantitative modeling of carbon monoxide shows that the project would have no change, or negligible changes, in concentrations at nearby locations (see Section 2.11.3). This indicates that the project would similarly not increase emissions or concentrations of greenhouse gases. The project is included in the 2009 RTP and TIP, which contain adopted strategies for greenhouse gas emissions from transportation sources. Specifically, TIP reference number 230550, “Transportation Climate Action Campaign,” is an adopted 5-year program for the Bay Area region involving outreach and education, promotion of safe routes to school and transit, and funding for transit priorities. The adopted TIP also demonstrates that the region will remain below all approved “vehicle emission budgets” through the 2035 study year.

The project design incorporates facilities that will improve access to alternative modes of transportation. This project focuses on improving the traffic operations at the interchange intersections and ramps. The project would not add capacity to US 101, and would not affect traffic flow at a regional level (compared to the No Build Alternative). The project would therefore not result in substantial direct or indirect emissions of greenhouse gases.

2.20.3. Construction Emissions

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. Measures to reduce construction emissions are listed in Section 2.11.4 and include maintenance of construction equipment and vehicles, limiting of construction vehicle idling time, and scheduling and routing of construction traffic to reduce engine emissions.

CEQA Conclusion

While project construction will result in a slight increase in GHG emissions, it is anticipated that this increase will be offset by the subsequent reduction in operational GHG emissions. While it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct impact and its contribution on the cumulative scale to climate change, Caltrans is firmly committed to implementing measures to help reduce GHG emissions. These measures are outlined in the following section.

2.20.4. AB 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as CARB works to implement the Governor's Executive Orders and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a \$222 billion infrastructure improvement program to fortify the State's transportation system, education, housing, and waterways, including \$100.7 billion in transportation funding during the next decade. As shown on the figure below, the Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in GHG emissions. The Strategic Growth Plan proposes to

do this while accommodating growth in population and the economy. A suite of investment options has been created that when combined together yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

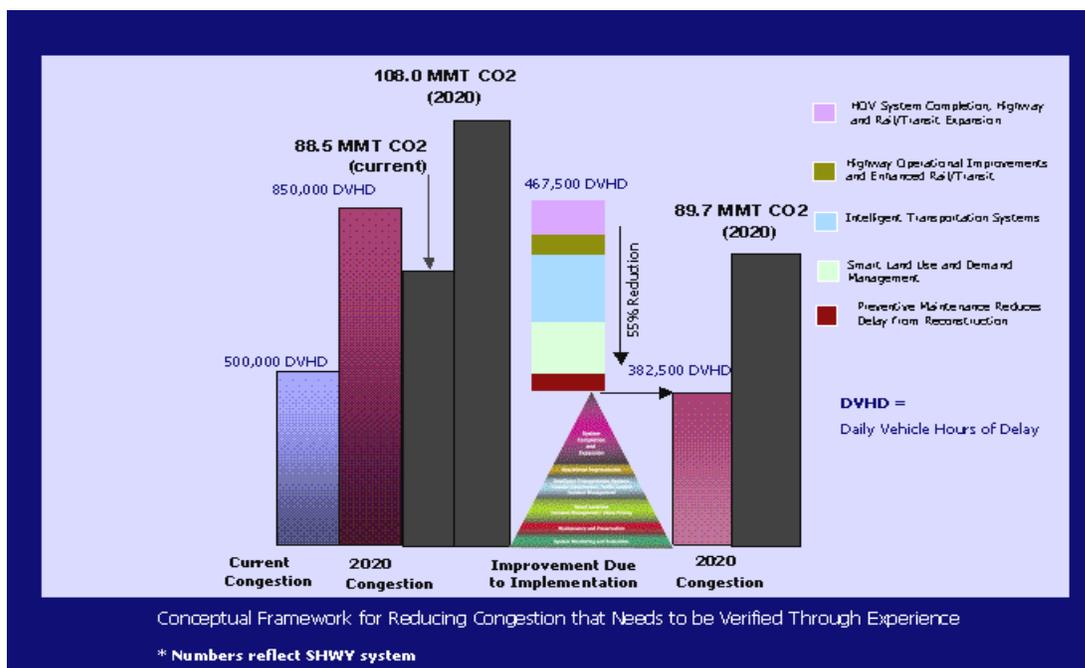


Figure 2.20-3 Outcome of Strategic Growth Plan

As part of the Climate Action Program at Caltrans (December 2006, <http://www.dot.ca.gov/docs/ClimateReport.pdf>), the Department is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks. Caltrans is doing this by supporting ongoing research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by the USEPA and

CARB. Lastly, the use of alternative fuels is also being considered; the Department is participating in funding for alternative fuel research at UC Davis.

Table 2.20-1 summarizes Department and statewide efforts that Caltrans is implementing to reduce GHG emissions. For more detailed information about each strategy, please see the Climate Action Program at Caltrans (December 2006); it is available at <http://www.dot.ca.gov/docs/ClimateReport.pdf>.

To the extent that it is applicable or feasible for the project and through coordination with the Project Development Team (PDT), the following measures will be included in the project to reduce the GHG emissions and potential climate change impacts from the project:

1. Caltrans and the California Highway Patrol are working with regional agencies to implement intelligent transportation systems (ITS) to help manage the efficiency of the existing highway system. ITS is commonly referred to as electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.
2. US 101 is part of the Bay Area high occupancy vehicle lane network, and the MTC and other agencies actively encourage ridesharing (e.g., the “511.org” ridesharing information link provides resources for ride sharing and trip planning). Ridesharing, or carpooling, reduces vehicle trips and their associated emissions.
3. The project will utilize energy efficient lighting, which will be defined during final design.

Table 2.20-1 Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO ₂ Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5% limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 .36	3.6
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

2.20.5. Adaptation Strategies

“Adaptation strategies” refers to how the Department and others can plan for the effects of climate change on the State’s transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect transportation infrastructure in various ways, such as increasing roadbed damage due to longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation caused by rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to transportation infrastructure.

Climate change adaptation must also involve the natural environment as well. Efforts are underway on a statewide level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, Governor Schwarzenegger signed Executive Order S-13-08, which directed a number of state agencies to address California’s vulnerability to sea level rise caused by climate change.

The California Resources Agency (now the Natural Resources Agency [Resources Agency]), through the interagency Climate Action Team, was directed to coordinate with local, regional, state and federal public and private entities to develop a state Climate Adaptation Strategy. The Climate Adaptation Strategy will summarize the best known science on climate change impacts to California, assess California's vulnerability to the identified impacts, and then outline solutions that can be implemented within and across state agencies to promote resiliency.

As part of its development of the Climate Adaptation Strategy, the Resources Agency was directed to request the National Academy of Science to prepare a Sea Level Rise Assessment Report by December 2010 to advise how California should plan for future sea level rise. The report is to include:

- Relative sea level rise projections for California, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates;
- The range of uncertainty in selected sea level rise projections;
- A synthesis of existing information on projected sea level rise impacts to State infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems; and
- A discussion of future research needs regarding sea level rise for California.

Furthermore, Executive Order S-13-08 directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level affecting safety, maintenance, and operational improvements of the systems and economy of the State. The Department continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Prior to the release of the final *Sea Level Rise Assessment Report*, all State agencies that are planning to construct projects in areas vulnerable to future sea level rise were directed to consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. However, all projects that have filed a Notice of Preparation, and/or are programmed for construction funding during the next 5 years (through 2013), or are routine maintenance projects as of the date of Executive Order S-13-08 may, but are not required to, consider these planning guidelines.¹⁸ Sea level rise estimates should also be used in conjunction with information regarding local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data, although Executive Order S-13-08 allows some exceptions to this planning requirement. The potential effects of sea level rise on the proposed project are discussed at the end of this section.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. The Department is an active participant in the efforts being conducted as part of Governor Schwarzenegger's Executive Order on Sea Level Rise and is mobilizing to be able to

¹⁸ The US 101/Broadway Interchange Reconstruction Project does not meet these criteria. A discussion of sea level rise is included at the end of this section.

respond to the National Academy of Science report on Sea Level Rise Assessment, which is due to be released by December 2010.

On August 3, 2009, the Natural Resources Agency, in cooperation and partnership with multiple state agencies, released the 2009 California Climate Adaptation Strategy Discussion Draft. The draft summarizes the best known science on climate change impacts in seven specific sectors and provides recommendations on how to manage those threats. The release of the draft document marked the beginning of a 45-day public comment period. Led by the California Natural Resources Agency, numerous other state agencies were involved in the creation of the discussion draft, including Environmental Protection; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The discussion draft focuses on sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. The strategy addresses Gov. Schwarzenegger's November 2008 Executive Order S-13-08 directive that the Natural Resources Agency identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. As data continues to be developed and collected, California's adaptation strategy will be updated to reflect current findings. A revised version of the report was posted on the Natural Resource Agency website on December 2, 2009, and can be viewed at:
<http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF>.

The Department is now working to assess which transportation facilities are most vulnerable to climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change impacts, the Department has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, the Department will be able to review its current design standards and determine what changes, if any, may be warranted in order to protect the transportation system from sea level rise.

The BCDC has produced maps projecting potential inundation for two San Francisco Bay water elevation scenarios: a 16-inch sea level rise by midcentury and a 55-inch rise by end of century. The midcentury estimate shows inundation at the shoreline but minor effects at the US 101/Broadway interchange. The end of century estimate shows substantial inundation of the interchange area (regional maps available at

http://www.bcdc.ca.gov/planning/climate_change/index_map.shtml). Preventing inundation of the magnitude estimated for end of century would require an overall increase in the elevation of US 101 and connecting local roads. Climate change scenarios of a lesser magnitude, similar to the midcentury estimate or less, could still result in impacts to the facility. Impacts could include, for example, increased runoff potentially requiring drainage improvements, or increased life-cycle costs for roadway maintenance from increased summer heat intensity or wintertime rainfall and runoff. The proposed project improvements will help but not fully address some of these effects, depending on their magnitude. The project includes improvements to the drainage culverts at Bayshore Highway and drainage modifications to eliminate the flooding around the eastern landing of the Broadway overcrossing. The project will also improve intersection traffic operations, which will help address emergency response and access through the project area.

Chapter 3. Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures, and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including project development team meetings and interagency coordination meetings. This chapter summarizes the results of the Department's efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

3.1. Initial Project Development and Public Participation

Conceptual information about the project has been available to the public since at least the late 1980s. Reconstruction of the US 101/Broadway interchange was included in San Mateo County Tax Measure A, approved in June 1988 as part of planned improvements to US 101. Measure A authorized the imposition of a ½-cent sales tax and the creation of SMCTA to administer the proceeds. In November 2004, San Mateo County voters approved a 25-year extension of the ½-cent sales tax. The proposed project is also in the reauthorized Measure A expenditure plan (SMCTA 2004).

In October 2002, SMCTA and the project design consultants gave a presentation about the proposed project and the US 101 Auxiliary Lane Project to the Burlingame City Council and interested members of the public. The presentation discussed the traffic and circulation issues that the US 101/Broadway project would address, the alternatives evaluated in the PSR, and the Buttonhook/Diamond Interchange that was proposed as the build alternative. The PSR was approved in 2005 but lack of funding prevented the project from proceeding to the environmental review phase.

Public input on the project will be solicited during the review period for this Initial Study/Environmental Assessment (IS/EA). See Section 3.3 for additional information.

3.2. Consultation and Coordination with Public Agencies

This section summarizes the results of contact and consultation with other public agencies during project development. These include specific consultation with federal, state, and local agencies as listed below.

U.S Fish and Wildlife Service

- A list of species of concern was obtained from the online database of the USFWS Sacramento field office in February 2009 to assist in the identification of sensitive plant and wildlife species that might occur in the project region. Updated USFWS species lists were obtained in December 2009, June 2010, and August 2010 (Appendix I).
- Caltrans and URS project team members conducted a site visit with staff from USFWS and CDFG on February 23, 2010, to discuss the project design, species- and habitat-related issues in the project vicinity, potential impacts to special-status species, and proposed avoidance and minimization measures.

City of Burlingame

- URS project team members presented the proposed project to the Burlingame City Council on February 1, 2010.

Bay Conservation and Development Commission

- PDT members met with BCDC staff and an Association of Bay Area Governments/Bay Trail representative on May 26, 2010. The purpose of the meeting was to provide an overview of the project and specific activities that would take place within BCDC jurisdiction, including realignment of a short Bay Trail segment; and to present preliminary mapping of the BCDC jurisdictional boundaries in the project area for BCDC's review and concurrence.

Bicycle and Pedestrian Advisory Committee

- PDT members presented the proposed project to the Bicycle and Pedestrian Advisory Committee (BPAC) of the City/County Association of Governments of San Mateo County (C/CAG) on May 27, 2010.

3.3. Circulation, Review, and Comment on the Draft Environmental Document

This IS/EA will be available for public review for a period of not less than 30 days. The public will be notified of the availability of the IS/EA by a number of methods, including postings on the SMCTA and City of Burlingame Web sites and a mailed announcement to interested agencies and individuals. During the review period, the Department and SMCTA will hold a public meeting to share information about the project and collect comments on the IS/EA from interested parties. The review period and instructions for submitting comments are included on the first page of this document. After the comment review period ends, a Final IS/EA will be prepared that will contain all comments received and the responses to those comments. If the Final IS/EA is approved, a Mitigated Negative Declaration and a Finding of No Significant Impact will be signed and included with the Final IS/EA.



Chapter 4. List of Preparers

This document and its related technical studies were prepared under the supervision of Caltrans District 4. The Project Development Team (PDT) was responsible for oversight of the project and consists of representatives from Caltrans, SMCTA, the City of Burlingame, and PBS&J.

Key PDT Members Involved in Project Management

- Al B. Lee, Project Manager, Caltrans District 4
- Khai Leong, Caltrans District 4
- Amir-Fardin Sadeghi-Nedjad, Caltrans District 4 Design
- Ed Pang, Caltrans District 4 Environmental Analysis
- James W. McKim, Senior Engineer, SMCTA
- Art Morimoto, Assistant Director of Public Works, City of Burlingame
- Syed Murtuza, Director of Public Works, City of Burlingame
- William R. Hughes, Project Director, PBS&J
- Ramsey Hissen, Principal in Charge, URS Corporation
- Scott Kelsey, Contract Manager, URS Corporation
- Ramesh Sathiamurthy, Engineering Project Manager, URS Corporation
- Jeff Zimmerman, Environmental Manager, URS Corporation
- Erdal Karataylioglu, Project Engineer, URS Corporation

Individuals Involved in Caltrans Oversight of the Environmental Studies

- Glenn Kinoshita, District Branch Chief Air/Noise Studies – Reviewed Noise and Air Quality
- Michelle P. Squyer, PQS, Architectural Historian – Reviewed Historic Resources
- Lorena Wong, District Branch Chief, Office of Landscape Architecture – Reviewed Visual Resources
- Benjamin Harris, Archaeologist – Reviewed Cultural Resources
- Elizabeth Kruse, Branch Chief, South Counties – Reviewed Cultural Resources
- Margaret Gabil, Branch Chief, Office of Biological Sciences and Permits – Reviewed Wetlands, Biological Assessments, and Natural Environment Study
- Laura Ivey, Landscape Associate – Reviewed Biological Assessment, Jurisdictional Delineation, and Natural Environment Study
- Tom Rosevear, Associate Environmental Planner – Reviewed Community Impact Assessment and Environmental Document

- Ed Pang, Senior Environmental Planner – Manager of Caltrans environmental oversight and Environmental Document preparation
- Ronald Karpowicz, Engineering Geologist – Reviewed Geology
- Grant Wilcox, Chief, Branch B, Office of Geotechnical Design/West – Reviewed Geology
- Chris Wilson, Senior Transportation Engineer – Reviewed Hazardous Waste/Initial Site Assessment
- Ganga Tripathi, Transportation Engineer – Reviewed Hazardous Waste/Initial Site Assessment
- Dixon Lau, Senior Transportation Engineer – Reviewed Hydrology/Water Quality
- Lance Hall, Senior Transportation Engineer – Reviewed Traffic
- Derek Man, Transportation Engineer – Reviewed Traffic

Individuals Involved in Technical Studies and Environmental Document Preparation

The following key consulting team staff were responsible for the preparation of the environmental technical studies and the environmental document:

Nayan Amin, URS Corporation, M.S., Civil Engineering. Experience in traffic projections, modeling, and operation analysis. Contribution: Traffic study and report.

Joe Bandel, URS Corporation, B.S., Wildlife, Fish and Conservation Biology. Experience in fisheries and field biology. Contribution: Jurisdictional Delineation and Natural Environment Study preparation.

Cheryl Brookshear, JRP Historical Consulting Services, M.S., Historic Preservation. Contribution: Prepared the Historical Resources Evaluation Report.

Catherine Byun, WRECO, MEM (Master of Environmental Management), Urban Ecology and Environmental Design; B.A., English. Contribution: Prepared Water Quality Study and Storm Water Data Report.

Erica J. Cruz, WRECO, B.S., Civil and Environmental Engineering. Contribution: Prepared the Drainage Impact Report.

Joel Dickerson, URS Corporation, M.S., Civil Engineering. Contribution: Engineering design and CADD work.

- Fletcher Halliday, URS Corporation, B.S., Molecular Environmental Biology.
Experience in community ecology and plant biology. Contribution: Biological Assessment preparation.
- Brian Hatoff, URS Corporation, M.A., Anthropology. Experience in cultural resource management. Contribution: Senior reviewer and manager of Cultural Resources Studies.
- Ulysses Hillard, WRECO, M.S.E., Hydrology; B.S., Environmental Engineering Science; B.A., History. Contribution: Location Hydraulic Study.
- William Kanemoto, William Kanemoto & Associates, M. Landscape Architecture. Specialist in visual impact assessment. Contribution: Visual Impact Assessment.
- Erdal Karataylioglu, URS Corporation, M.Eng., Civil Engineering. Contribution: Project engineering, design, coordination, and CADD work; preparation of Project Report and other engineering deliverables.
- Lindsay Lane, URS Corporation, M.S., Environmental Science and Management. Contribution: Environmental Document review.
- Han-Bin Liang, WRECO, Ph.D., Civil Engineering. Contribution: Oversight and review of Storm Water Data Report and Location Hydraulic Study.
- Dean Martorana, URS Corporation, M.A., Anthropology, Cultural resource management. Contribution: Preparation of Archaeological Survey Report and Historic Properties Survey Report.
- Lynn McIntyre, URS Corporation, B.A., Journalism. Contribution: Community Impact Assessment preparation; Environmental Document preparation/review; deputy environmental project management.
- David Pecora, URS Corporation, B.S., Marine Science. Experience in fish biology, biological field studies, marine and aquatic biology, and biological sampling. Contribution: Natural Environment Study preparation.
- Galen Peracca, URS Corporation, B.S., Resource Management; M.F., Forestry. Experience in wetland delineation, botany, and Endangered Species Act compliance. Contribution: Natural Environment Study preparation.

Linda Peters, URS Corporation, B.A., Anthropology. Experience in NEPA, transportation planning, Section 4(f), cultural resources, and hazardous materials. Contribution: Environmental Document preparation.

Casey Stewman, URS Corporation, M.A., Biological Sciences; B.S., Biological Sciences. Experience in plant ecology, plant taxonomy, resource management, wetland science, plant community mapping, revegetation, and CEQA-NEPA analyses. Contribution: Jurisdictional Delineation preparation.

Avanti Tamhane, URS Corporation, M.S., Environmental Analysis and Decision Making; B.S., Chemical Engineering. Experience in air quality regulatory compliance and permitting. Contribution: Air Quality Report preparation.

Michael Thill, Illingworth & Rodkin, B.S., Environmental Studies. Specialist in field research, analyzing noise data, and noise modeling. Contribution: Noise Study Report.

Cheri Velzy, URS Corporation, B.S., Meteorology. Experience in air quality analysis. Contribution: Air Quality Report oversight and review.

Patrick Walz, URS Corporation, B.S., Civil Engineering. Experience in hazardous waste investigations and reporting. Contribution: Initial Site Assessment preparation.

Jeff Zimmerman, URS Corporation, B.S., Conservation of Natural Resources. Experience in environmental documentation and CEQA/NEPA process. Contribution: Environmental project manager.

Chapter 5. Distribution List

The following agencies, organizations, and individuals received printed or electronic copies of this document. Agencies, organizations, and individuals on the project mailing list were notified of the availability of this document and public meetings as described in Chapter 3. Agency names marked with an asterisk (*) received copies through the State Clearinghouse.

Federal Agencies

Federal Highway Administration
650 Capitol Mall
Sacramento, CA 95814

National Marine Fisheries Service
Bay Area Office
777 Sonoma Avenue, Room 325
Santa Rosa, CA 94502

U.S. Army Corp of Engineers
Regulatory Branch
San Francisco District
Attention: CESP-N-CO-R
333 Market Street, 8th Floor
San Francisco, CA 94105

U.S. Department of Agriculture
Natural Resources Conservation
Service
430 G Street, #4164
Davis, CA 95616

U.S. Fish and Wildlife Service
U.S. Department of Interior
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

U.S. Environmental Protection
Agency, Region 9
75 Hawthorne Street
San Francisco, CA 94105

Director, Office of Environmental
Policy and Compliance
Department of the Interior
Main Interior Bldg. MS 2340
1849 C Street, NW
Washington, DC 20240

State Agencies

Executive Director
Office of Planning and Research
State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

California Department of
Conservation*
801 K Street, MS 24-01
Sacramento, CA 95814

California Department of Fish and
Game*
Fisheries, Wildlife, and Environmental
Programs
P.O. Box 47
Yountville, CA 94599

Office of Historic Preservation*
1416 Ninth Street, Room 1442
Sacramento, CA 95814

California Department of Parks and
Recreation*
Resources Management Division
P.O. Box 942896
Sacramento, CA 94296

California Department of Water
Resources
Reclamation Board
1416 Ninth Street, Room 1601
Sacramento, CA 95814

California Department of Water
Resources*
Environmental Services Office
3251 S Street, Room 111
Sacramento, CA 95816

California Highway Patrol*
Office of Special Projects
2555 1st Avenue
Sacramento, CA 95818

California Resources Agency*
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

California Department of General
Services*
Environmental Services Section
1325 J Street, Suite 1910
Sacramento, CA 95814

California Air Resources Board*
Transportation Projects
1102 Q Street
Sacramento, CA 95812

Integrated Waste Management Board
P.O. Box 4025
Sacramento, CA 95812

California State Water Resources
Control Board*
Division of Water Quality
P.O. Box 100
Sacramento, CA 95812

California Department of Toxic
Substances Control*
700 Heinz Avenue, Suite 200
Berkeley, CA 94710

California Energy Commission
1516 Ninth Street, MS-29
Sacramento, CA 95814

Native American Heritage
Commission*
915 Capitol Mall, Room 364
Sacramento, CA 95814

Public Utilities Commission*
505 Van Ness Avenue
San Francisco, CA 94102

California State Lands Commission
100 Howe Avenue, Suite 100 South
Sacramento, CA 95825

Regional

Bruce Wolfe, Executive Officer*
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Henry Gardner, Executive Director
Association of Bay Area Governments
101 8th Street
Oakland, CA 94604

Steve Heminger, Executive Director
Metropolitan Transportation
Commission
101 8th Street
Oakland, CA 94604

William Norton, Executive Officer
Bay Area Air Quality Management
District
939 Ellis Street
San Francisco, CA 94109

Laura Thompson, Bay Trail Project
Manager
Association of Bay Area Governments
101 Eighth Street
Oakland CA 94607-4756

Kellyx Nelson, Executive Director
San Mateo County Resource
Conservation District
625 Miramontes Street, Suite 103
Half Moon Bay, CA 94019

Robert Batha, Chief of Permits
San Francisco Bay Conservation and
Development Commission
50 California Street, Suite 2600
San Francisco, CA 94111

Mel Pincus
San Mateo County Department of
Parks Commission
455 County Center, 4th Floor
Redwood City, CA 94063-1646

Julia Bott, Executive Director
San Mateo County Parks and
Recreation Foundation
215 Bay Road
Menlo Park, CA 94025

James C. Porter, Department Director
San Mateo County
Department of Public Works
555 County Center, 5th Floor
Redwood City, CA 94063

Dan Diverde, Operations Manager
Allied Waste of San Mateo County
333 Shoreway Road
San Carlos, CA 94070

San Francisco Public Utilities
Commission
1155 Market Street, 11th floor
San Francisco CA, 94103

San Mateo County Transportation
Authority
Citizens Advisory Committee
1250 San Carlos Avenue
San Carlos, CA, 94070-1306

Peninsula Corridor Joint Powers Board
(Caltrain)
P.O. Box 3006
San Carlos, CA 94070-1306

San Mateo County Transit District
(SamTrans)
P. O. Box 3006
San Carlos, CA 94070-1306

Peninsula Traffic Congestion Relief
Alliance
1150 Bayhill Drive, Suite 107
San Bruno, CA 94066

Metropolitan Transportation
Commission
101 Eighth Street
Oakland, California 94607

Bay Area Rapid Transit District
P.O. Box 12688
Oakland CA 94604-2688

Bay Area Bicycle Coalition
P.O. Box 2214
Novato, CA 94948

Leah Shahum, Executive Director
Attn: Jodie Medeiros, Development
Director
San Francisco Bicycle Coalition
995 Market Street #1550
San Francisco, CA 94103

Corinne Winter, Executive Director
Silicon Valley Bicycle Coalition
P.O. Box 8447
San Jose, CA 95155

Ms. Stephanie Isaacson, Public Affairs
Pacific Gas and Electric Co.
275 Industrial Road
San Carlos CA 94070

Local

Maureen Brooks, Planning Manager
Burlingame Community Development
501 Primrose Road
Burlingame, California 94010-3997

Syed Murtuza, Director of Public
Works
Burlingame Public Works
501 Primrose Road
Burlingame, CA 94010

Nixon Lam, Environmental Planner
San Francisco International Airport
P.O. Box 8097
San Francisco, CA 94128

John Bergener, Planning Manager
San Francisco International Airport
P.O. Box 8097
San Francisco, CA 94128

Federal Elected Officials

The Honorable Barbara Boxer
United States Senator
1700 Montgomery Street, Suite 240
San Francisco, CA 94111

The Honorable Dianne Feinstein
United States Senator
One Post Street, Suite 2450
San Francisco, CA 94104

The Honorable Jackie Speier
Representative in Congress, 12th
District
400 South El Camino Real, Suite 750
San Mateo, CA 94402-1704

State Elected Officials

Jerry Hill, State Assembly District 19
1528 S. El Camino Real #302
San Mateo 94402

Leland Y. Yee, State Senate District 8
400 S. El Camino Real, Ste 630
San Mateo CA 94402
State Capitol Room 4048
Sacramento, CA 95814

Local Elected Officials

Mark Church, San Mateo Board of
Supervisors, District 1
Hall of Justice
400 County Center
Redwood City, CA 94063

Ann Keighran, Mayor
City of Burlingame
P.O. Box 1622
Burlingame CA 94011

Chapter 6. References

- ABAG. 2004. Liquefaction Susceptibility Maps. Association of Bay Area Governments. URL: <http://abag.ca.gov/bayarea/eqmaps/liquefac/liquefac>. Accessed April 16, 2009.
- ABAG. 2007. Association of Bay Area Governments Projections 2007 data. In Existing Housing Need Data: City of Burlingame, San Mateo County, prepared for Countywide Housing Element Update project. July 18, 2008. URL: <http://www.21elements.com/Download-document/78-Burlingame-Word>. Accessed April 2009.
- ABAG. 2009. San Francisco Bay Trail: Overview. Association of Bay Area Governments. URL: <http://baytrail.abag.ca.gov/overview.html>. Accessed April 2009.
- AEP. 2007. Recommendations by Association of Environmental Professionals (AEP) on How to Analyze Greenhouse Gas Emissions and Global Climate change in CEQA Documents. March 5, 2007.
- BAAQMD. 1999. BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans. Bay Area Air Quality Management District. December 1999.
- BAAQMD. 2006. Ozone Strategy Bay Area 2005. Bay Area Air Quality Management District. URL: <http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Bay-Area-Ozone-Strategy/2005-Bay-Area-Ozone-Strategy.aspx>. January 2006.
- BAAQMD. No date. Air Quality Standards and Attainment Status. Bay Area Air Quality Management District. URL: http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm. Accessed September 30, 2009.

- BCDC. 2008. San Francisco Bay Plan. San Francisco Bay Conservation and Development Commission. Adopted 1968. Last reprinted February 2008. URL: <http://www.bcdc.ca.gov/pdf/planning/plans/bayplan/bayplan.pdf>.
- Bias, M.A. 1994. Ecology of the salt marsh harvest mouse in San Pablo Bay. [Ph.D. Dissertation]. Berkeley (CA): University of California.
- Burlingame Police Department. 2009. About the police department: Police department structure and services. URL: <http://www.burlingame.org/Index.aspx?page=750>.
- Calfish. 2009. California Cooperative Anadromous Fish and Habitat Data Program. Accessed March 20, 2009. Available from <http://www.calfish.org>
- C/CAG. 2001. Countywide Transportation Plan 2010. City/County Association of Governments of San Mateo County, in association with the Cities of San Mateo County, San Mateo County Transit District, and San Mateo County Transportation Authority. Adopted January 18, 2001. URL: http://www.ccag.ca.gov/pdf/documents/archive/ctp-exec_summary.pdf. Accessed February 13, 2009.
- C/CAG. 2002. San Mateo County Transit-Oriented Development Incentive Program. City/County Association of Governments of San Mateo County. URL: http://www.ccag.ca.gov/pdf/documents/archive/sg_awards_ccag.pdf. Accessed April 2009.
- California Geological Survey. 2000. A General Location Guide for Ultramafic Rocks in California: Areas More Likely to Contain Naturally Occurring Asbestos. Map scale 1:1,100,000. Department of Conservation, Division of Mines and Geology. Open-File Report 2000-19. August. URL: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/ofr_2000-019.pdf. Accessed September 30, 2009.

- Caltrain, no date. Peninsula Rail Program Frequently Asked Questions. URL: http://www.caltrain.com/pdf/peninsularailprogram/HSR_FAQ_FINAL.pdf. Accessed December 12, 2009.
- CDFG. 2009. Calfish Database IMAPs Viewer. URL: <http://imaps.dfg.ca.gov>. Accessed March 5, 2009.
- CDFG. 2010. California Natural Diversity Data Base (CNDDDB), Program “Rarefind,” version 3.10 [Computer Program]. California Department of Fish and Game. Data update current through August 28, 2010. Sacramento, CA.
- Chou. 2009. Personal communication between Augustine Chou, City of Burlingame Traffic Engineer, and Lynn McIntyre, URS Oakland. October 16, 2009.
- City of Burlingame. 1969. General Plan. Adopted 1969; elements amended various dates. URL: <http://www.burlingame.org/Index.aspx?page=151>.
- City of Burlingame. 2004. North Burlingame/Rollins Road Specific Plan. As approved by the Burlingame City Council, Resolution No. 85-2004, September 20, 2004, and as amended by Resolution No. 13-2007, February 5, 2007. Available from <http://www.grandboulevard.net/library/Burlingame/North%20Bulingame%20Rollins%20Road%20Specific%20Plan/burlingameroadspecificplan.pdf>
- City of Burlingame. 2006. Burlingame Bayfront Specific Plan. City of Burlingame Planning Department. Approved by the Burlingame City Council, Resolution No. 26-2004, April 5, 2004; amended by Resolution No. 58-2006, August 21, 2006. URL: <http://www.burlingame.org/Modules/ShowDocument.aspx?documentid=145>. Accessed January 2009.
- City of Burlingame. 2007. North Burlingame/Rollins Road Specific Plan. Adopted September 20, 2004; amended February 5, 2007. URL: <http://www.burlingame.org/Index.aspx?page=151>.
- City of Burlingame. 2009. Capital Improvement Projects to be Funded by the Proposed Storm Drain Fee. Easton Creek - Marsten Pump

Station addition and Outfall pipeline project. URL:
<http://www.burlingame.org/Index.aspx?page=1319#No1>.
Accessed December 12, 2009.

City of Burlingame. 2010. Major Development Projects in Burlingame. Community Development Department, Planning Division. URL:
<http://www.burlingame.org/Modules/ShowDocument.aspx?documentid=50>. Last updated July 23, 2010. Accessed August 24, 2010.

City of Burlingame. No date. Burlingame Parks and Recreation Facilities Guide. Department of Parks and Recreation. URL:
<http://www.burlingame.org/Modules/ShowDocument.aspx?documentid=1129>. Accessed March 31, 2009.

CNPS. 2009. Inventory of Rare and Endangered Plants of California. Online inventory, version 7-08a. California Native Plant Society. Accessed on February 1, 2008. Available from
<http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi>

Department. 1990. Project Study Report (PSR) for US 101/Broadway Interchange Reconstruction Project. EA 04-217-23584G. California Department of Transportation. Approved July 16, 1990.

Department. 1997. Community Impact Assessment. Caltrans Environmental Handbook, Volume 4. California Department of Transportation. URL:
<http://www.dot.ca.gov/ser/vol4/envhb4.pdf>.

Department. 2003. Storm Water Quality Handbooks, Project Planning and Design Guide: Construction Site Best Management Practices (BMPs) Manual. California Department of Transportation. URL:
http://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf. March 2003.

Department. 2006. Climate Action Program at Caltrans. California Department of Transportation. URL:
<http://www.dot.ca.gov/docs/ClimateReport.pdf>. December 2006.

- Department. 2007. Highway Design Manual. Chapter 1100, Highway Traffic Noise Abatement. California Department of Transportation. January 4, 2007.
- Department. 2009a. Traffic Counts. Back AADT for US 101 at Broadway, PM 16.575. Traffic and Vehicle Data Systems Unit. California Department of Transportation. URL: <http://www.traffic-counts.dot.ca.gov/2008all/r101i.htm>. Accessed September 27, 2009.
- Department. 2009b. Caltrans TASAS Tables B and D for PM 14.69 to 17.95, April 1, 2005, to March 31, 2008. California Department of Transportation.
- Department. 2009c. Log of Bridges on State Highways. District 04: 04-SM-101. Broadway overcrossing, Burlingame. Structure Maintenance and Investigations. California Department of Transportation. URL: <http://www.dot.ca.gov/hq/structur/strmaint/brlog/logpdf/logd04.pdf>. Accessed October 16, 2009.
- Department. 2009d. Highway Design Manual. Chapter 1000, Bikeway Planning and Design. California Department of Transportation. July 24, 2009.
- Department. 2009e. Highway Design Manual. Chapter 300, Geometric Cross Section. California Department of Transportation. July 24, 2009.
- Department. 2009f. U.S. Fish and Wildlife Service Biological Assessment: State Route 84 Dumbarton Seismic Retrofit Project, Alameda County and San Mateo County, California. EA 04-3A5000. California Department of Transportation.
- Department and SMCTA. 2003. Route 101 Auxiliary Lanes Project, 3rd Avenue to Millbrae Avenue, San Mateo County. EA 264200. Prepared for California Department of Transportation District 4 and San Mateo County Transportation Authority by David J. Powers and Associates, Inc. URL: http://www.dot.ca.gov/dist4/documents/101_aux_lanes_ea_is.pdf. Accessed June 20, 2008. June 2003.

- Garza, V.J., P. Graney, and D. Sperling. 1997. Transportation Project-Level Carbon Monoxide Protocol. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-97-21.
- FHWA, 1988. Visual Impact Assessment for Highway Projects. Federal Highway Administration.
- FHWA. 2006a. Guidance on Air Toxic Analysis in NEPA Documents. Federal Highway Administration. URL: www.fhwa.dot.gov/environment/airtoxic/020306guidmem.htm.
- FHWA. 2006b. A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives. Federal Highway Administration. URL: <http://www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm>.
- Geissel, W.H., H.S. Shellhammer and H.T. Harvey. 1988. The ecology of the salt marsh harvest mouse (*Reithrodontomys raviventris*) in a diked salt marsh. *J. Mammalogy*. 69: 696-703.
- Grijalva, E, D. Kerr, and K. Zarembo. 2006. Cordgrass and Clapper Rails. Quarterly Newsletter of the California Invasive Plant Council, Cal-IPC News. Vol. 13, No. 4, Winter 2006. Berkeley, CA.
- Harvey, H.T. & Associates. 2005. South Bay Salt Pond Restoration Project: Biology and Habitats Existing Conditions Report. Submitted to California State Coastal Conservancy, U.S. Fish and Wildlife Service, and California Department of Fish and Game. Prepared by H.T. Harvey and Associates in association with Philip William and Associates Ltd., EDAW, and Brown and Caldwell. March. URL: http://www.southbayrestoration.org/pdf_files/Biology_Habitats_Existing_Conditions.3.25.05.pdf.
- Hill and Basin Research. 2002. Historic Architectural Survey Report. Route 101 Auxiliary Lanes Project, 3rd Avenue to Millbrae Avenue, San Mateo County. Prepared for San Mateo County Transportation

- Authority and David J. Powers and Associates, Inc. by Ward Hill and Basin Research Associates, Inc. January; revised May 24, 2002.
- Illingworth and Rodkin. 2009. Noise Study Report. US 101 / Broadway Interchange Reconstruction Project, San Mateo County. District 4, 04-SM-101-16.30/17.06, EA 235840. Prepared for Caltrans under subcontract to URS. September 2009.
- Jennings, M.R. and M.P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. Final Report to the California Department of Fish and Game.
- JRP. 2009. Historic Resources Evaluation Report. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared under subcontract to URS Corporation for Caltrans, San Mateo Transportation Authority, and City of Burlingame by JRP Historical Consulting, Davis, CA. December 2009.
- Kobernus, P. 2009. Biological Resources Assessment for BMW Service Center Culvert Crossing Project, 1625 - 1633 Adrian Road and 1616 Rollins Road. Burlingame, California. Prepared for Peter Pan Motors, Inc., San Mateo, CA.
- Leidy, R.A., G.S. Becker, and B.N. Harvey. 2005a. Historical Distribution and Current Status of Steelhead/Rainbow Trout (*Oncorhynchus mykiss*) in Streams of the San Francisco Estuary, California. Oakland (CA): Center for Ecosystem Management and Restoration.
- Leidy, R.A., G.S. Becker, and B.N. Harvey. 2005b. Historical Status of Coho Salmon in Streams of the Urbanized San Francisco Estuary, California. Oakland (CA): Center for Ecosystem Management and Restoration.
- McGinnis, S.M. 2002. The Status of the California Red-Legged Frog (*Rana aurora draytonii*) in the North End of the Burlingame Specific Plan

Area, Burlingame, CA. Prepared for Environmental Collaborative, Emeryville, CA.

Miller and Kaplan. 2001. Petition to List the North American Green Sturgeon (*Acipenser medirostris*) as an Endangered or Threatened Species under the Endangered Species Act. Prepared by the Environmental Protection Information Center, Center for Biological Diversity, and the Water Keepers of Northern California.

Moyle, P.B. 2002. Inland Fishes of California. University of California Press. 106-113, 245-281.

MTC. 2008. 2009 Transportation Improvement Program. Metropolitan Transportation Commission. Adopted by MTC on May 28, 2008, and adopted by FHWA/FTA on November 17, 2008. URL: <http://www.mtc.ca.gov/funding/tip/>.

MTC. 2009a. Transportation 2035 Plan for the San Francisco Bay Area. Regional Transportation Plan (RTP). Metropolitan Transportation Commission. Adopted April 22, 2009. URL: http://www.mtc.ca.gov/planning/2035_plan/.

MTC. 2009b. Regional Profiles in Smart Growth: San Mateo County Transit Oriented Development Incentive Program. Metropolitan Transportation Commission. URL: http://www.mtc.ca.gov/planning/smart_growth/sg_profiles.htm. February 27.

Mualchin, L. 1996. California Seismic Hazard Map 1996. California Department of Transportation, Office of Earthquake Engineering.

NOAA. 2008. Ocean Service Education: Estuaries. National Oceanic and Atmospheric Administration. URL: http://oceanservice.noaa.gov/education/kits/estuaries/estuaries01_what.html. Revised March 25, 2008.

NOAA Fisheries. 2005. Endangered and Threatened Species; Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California; Final Rule. 50 CFR Part 226 Vol. 70 (170): 52488-52627. National Oceanic and

Atmospheric Administration's National Marine Fisheries Service.

- NOAA Fisheries. 2007. Federal Recovery Outline for the Distinct Population Segment of the Central California Coast Steelhead. Available from http://swr.nmfs.noaa.gov/recovery/FINAL_Steelhead_061507.pdf.
- NOAA Fisheries. 2008. Fisheries Management Plan (FMP) Species Distributions in San Francisco, San Pablo and Suisun Bays. Accessed November 2009. Available from <http://swr.nmfs.noaa.gov/hcd/loclist.htm>
- NOAA Fisheries. 2009. Endangered and Threatened Wildlife and Plants: Final Rulemaking to Designate Critical Habitat for the Threatened Southern Distinct Population Segment of North American Green Sturgeon; Final Rule. 50 CFR Part 226. Federal Register (Volume 74, Number 195): 52300-52351. National Oceanic and Atmospheric Administration, National Marine Fisheries Service. URL: <http://www.epa.gov/fedrgstr/EPA-SPECIES/2009/October/Day-09/e24067.htm>. October 9, 2009.
- Parikh Consultants, Inc. 2005. Geotechnical Design and Material Report, Route 101 Auxiliary Lane Project, 3rd Avenue to Millbrae Avenue, San Mateo County, California. Prepared for California Department of Transportation District 4 and San Mateo County Transportation Authority under contract to Rajappan & Meyer Consulting Engineers, Inc., by Parikh Consultants, Inc. December 22, 2005.
- Rajappan and Meyer. 2005. Project Study Report. Broadway Interchange Reconstruction Project. In San Mateo County on Route 101 at the Broadway Interchange in Burlingame. 04-SM-101, KP 26.2/27.2 (PM 16.3/16.9), 04-245-23584K. Prepared for California Department of Transportation District 4 and San Mateo County Transportation Authority by Rajappan & Meyer Consulting Engineers, Inc. October 10. Approved November 22, 2005.

San Mateo County General Plan. 1986. Elements amended various dates. San Mateo County Planning and Building Department. URL: http://www.sforoundtable.org/P&B/pb_general_plan.html.

San Mateo County Department of Parks. 2008. San Mateo County Trails Master Plan Update. URL: <http://www.co.sanmateo.ca.us/portal/site/parks/>. Accessed May 11, 2010.

San Mateo County Parks and Recreation Commission. 2001. San Mateo County 2001 Trails Plan. Prepared for San Mateo County Parks and Recreation Commission by MHA Environmental Consulting, Inc., San Mateo, CA. URL: http://www.co.sanmateo.ca.us/vgn/images/portal/cit_609/12503872399%20Final%20Trails%20Plan.pdf.

SFEI. 2008. Salt Marsh Harvest Mouse, *Reithrodontomys raviventris*. Database and Maps Website. San Francisco Estuary Institute. Accessed February 25, 2010. Available from <http://www.sfei.org/ecoatlas/smhm/>

SFEISP. 2006. California Clapper Rail Surveys for the San Francisco Estuary Invasive Spartina Project 2006. Prepared for San Francisco Estuary Invasive Spartina Project by H. Spautz and J. McBroom, Olofson Environmental, Inc., Oakland, CA.

SFEISP. 2007. Report of California Clapper Rail Surveys Conducted at Thirty-five San Francisco Estuary Invasive Spartina Control Sites in 2007. Prepared for San Francisco Estuary Invasive Spartina Project by J. McBroom, Olofson Environmental, Inc., Berkeley, CA.

SFEISP. 2008. California Clapper Rail Surveys for the San Francisco Estuary Invasive Spartina Project 2008. Prepared for San Francisco Estuary Invasive Spartina Project by J. McBroom, Olofson Environmental, Inc., Berkeley, CA.

Shellhammer, H.S., R. Jackson, W. Davilla, A.M. Gilroy, H.T. Harvey, L. Simons. 1982. Habitat preferences of salt marsh harvest mice (*Reithrodontomys raviventris*). *Wasmann Journal of Biology* 40(1/2):102-114.

- STOPPP. 2005. Hydromodification Management Plan. San Mateo Countywide Stormwater Pollution Prevention Program. May 12. URL: <http://www.flowstobay.org/documents/business/new-development/HMP%20Report%20Final.pdf>. Accessed December 4, 2009.
- SMCTA. 2004. Transportation Expenditure Plan. San Mateo County Transportation Authority. URL: http://www.smcta.com/Expenditure_Plan/Complete.pdf. Accessed February 12, 2009.
- SMCTA. 2008. Strategic Plan for 2009–2013. San Mateo County Transportation Authority. San Carlos, CA. URL: http://www.smcta.com/pdf/TA_Strategic_Plan_2009-2013_Final.pdf. Accessed February 12, 2009.
- Spautz, H., N. Nadav, and D. Stralberg. 2005. California Black Rail (*Laterallus jamaicensis coturniculus*): Distribution and Abundance in Relation to Habitat and Landscape Features in the San Francisco Bay Estuary. USDA Forest Service Gen. Tech. Rep. PSW-GTR-191.
- TRA. 2007. Biological Site Assessment, 1510 Rollins Road, Burlingame, San Mateo County. Prepared for F.W. Spencer and Son, Inc., Brisbane, CA, by TRA Environmental Sciences, Inc. September.
- URS. 2009a. Community Impact Assessment. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, Oakland, CA. November 2009.
- URS. 2009b. Archaeological Survey Report. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, Oakland, CA. December 2009.

- URS. 2009c. Historic Property Survey Report. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, Oakland, CA. December 2009.
- URS. 2009d. Geotechnical Impact Report. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, San Jose, CA. May 20, 2009.
- URS. 2009e. Broadway Overcrossing (Bridge 35-0096) Preliminary Foundation Report. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, San Jose, CA. July 9, 2009.
- URS. 2009f. Retaining Walls Preliminary Foundation Report. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, San Jose, CA. July 7, 2009.
- URS. 2009g. Initial Site Assessment. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, San Jose, CA. May 2009.
- URS. 2009h. Air Quality Impact Assessment. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, Oakland, CA. December 2009.
- URS. 2009i. Mobile Source Air Toxics. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo

- Transportation Authority, and City of Burlingame by URS Corporation, Oakland, CA. December 2009.
- URS. 2010a. Traffic Operations Analysis Report. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, San Jose, CA. June 4, 2010.
- URS. 2010b. Draft Project Report. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, San Jose, CA. August 2010.
- URS. 2010c. Natural Environment Study. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation, Oakland, CA. April 21, 2010.
- URS. 2010d. Biological Assessment. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation. June 16, 2010.
- URS. 2010e. Jurisdictional Delineation. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared for Caltrans, San Mateo Transportation Authority, and City of Burlingame by URS Corporation. June 2010.
- USFWS. 2002. Recovery Plan for the California Red-Legged Frog (*Rana aurora draytonii*). Region 1, U.S. Fish and Wildlife Service, Portland, Oregon. May 28. URL:
http://www.fws.gov/ecos/ajax/docs/recovery_plan/020528.pdf.
- USFWS. 2003. Concurrence Letter for the Highway 101 3rd Avenue to Millbrae Avenue Auxiliary Lane Project, San Mateo County, California.

FWS File Number 1-1-02-I-3160. U.S. Fish and Wildlife Service, Sacramento, CA. March 28, 2003.

USFWS. 2006a. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the California Red-legged Frog (*Rana aurora draytonii*), and Special Rule Exemption Associated With Final Listing for Existing Routine Ranching Activities; Final Rule. 50 CFR Part 17 Vol. 71 (71): 19244-19346. U.S. Fish and Wildlife Service. URL: <http://a257.g.akamaitech.net/7/257/2422/01jan20061800/edocket.access.gpo.gov/2006/pdf/06-3344.pdf>. April 13, 2006.

USFWS. 2006b. San Francisco Garter Snake (*Thamnophis sirtalis tetrataenia*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Sacramento, CA. URL: http://ecos.fws.gov/docs/five_year_review/doc774.pdf. September 2006.

USFWS. 2009c. Biological Opinion on the City of Burlingame Creek Maintenance Project in the City of Burlingame. San Mateo County, California. USFWS File no. 81420-2009-F-0219-1. September 28.

USFWS. 2009d. Endangered Species Consultation on the Proposed BMW Service Center Culvert Crossing Project in Burlingame. San Mateo County, California. Corps File No. 2009-00074S. USFWS File No. 81420-2009-F-0418. July 9.

USFWS. 2010a. Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California. 75 Federal Register 27: 6696-6697. February 10, 2010.

USFWS. 2010b. Endangered and Threatened Wildlife and Plants: Revised Designation of Critical Habitat for California Red-Legged Frog; Final Rule (50 CFR Part 17). 75 Federal Register 51: 12816-12959. March 17.

Value Management Strategies. 2009. Preliminary Value Analysis Study Report (Task Order 164) D-4 US 101 – Broadway Interchange

- Reconstruction. Prepared by Value Management Strategies for URS Corporation. September 15.
- Wallace, R.E. 1990. The San Andreas Fault System, California. U.S. Geological Survey Professional Paper 1515.
- Winzler and Kelly. 2009. Draft Initial Study/Proposed Mitigated Negative Declaration for the Marsten Pump Station Upgrade and Outfall Pipeline Project – Revised Phase 2 Easton Creek Outfall Pipeline and Creek Widening. State Clearinghouse # 2002112061. Prepared for the City of Burlingame by Winzler & Kelly, Santa Rosa, CA. September 10.
- Witter, R.C., K.L. Knudsen, J.M. Sowers, C.M. Wentworth, R.D. Koehler, and C.E. Randolph. 2006. Maps of Quaternary deposits and liquefaction susceptibility in the central San Francisco Bay region, California, in cooperation with the California Geological Survey: A digital database. U.S. Geological Survey, Open-File Report 2006-1037.
- Woodbury, D. 2009. National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NOAA Fisheries). Phone and email communication with Galen Peracca, Biologist, URS, Oakland, CA. November 25.
- WRECO. 2009a. Location Hydraulic Study. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared under subcontract to URS Corporation for Caltrans, San Mateo Transportation Authority, and City of Burlingame by WRECO, Oakland, CA. November 2009.
- WRECO. 2009b. Storm Water Data Report. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared under subcontract to URS Corporation for Caltrans, San Mateo Transportation Authority, and City of Burlingame by WRECO, Oakland, CA. December 2009.

WRECO. 2010. Water Quality Study. US 101/Broadway Interchange Reconstruction Project. Project Approval/Environmental Document Phase. Prepared under subcontract to URS Corporation for Caltrans, San Mateo Transportation Authority, and City of Burlingame by WRECO, Oakland, CA. January 2010.

Yahoo Real Estate. 2009. Burlingame neighborhood profile. URL: <http://realestate.yahoo.com/California/Burlingame/neighborhoods>. Accessed April 2009.