State Route 116/121 Intersection Improvements Project

SONOMA COUNTY, CALIFORNIA
DISTRICT 4 – SON – 116, POST MILE 46.0/46.7
DISTRICT 4 – SON – 121, POST MILE 5.8/R7.4
EA 3G900 / Project ID 0412000557

Initial Study with Mitigated Negative Declaration / Environmental Assessment with Finding of No Significant Impact

Prepared by the
State of California Department of Transportation
and the Sonoma County Transportation Authority

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by the California Department of Transportation pursuant to 23 U.S.C. 327 and the Memorandum of Understanding dated December 23, 2016, and executed by Federal Highway Administration and the California Department of Transportation.

March 2018
GENERAL INFORMATION ABOUT THIS DOCUMENT

For individuals with sensory disabilities, this document can be made available in Braille, large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attention: Arnica MacCarthy, Department of Transportation, Office of Environmental Analysis, MS 8B, 111 Grand Avenue, Oakland, CA 94612, (510) 286-7195, or use California Relay Service 1 (800) 735-2929 (TTY), 1 (800) 735-2922 (Voice) or 711.
Improve the State Route (SR) 116/121 intersection in Sonoma County, from 1,250 feet north of the SR 116/121 intersection on SR 116/Arnold Drive to 800 feet south of the SR 116/121 intersection on SR 121/Arnold Drive and from 200 feet west of the SR 116/121 intersection on Bonneau Road to 1,650 feet east of the SR 116/121 intersection on SR 121/Fremont Drive.

INITIAL STUDY with MITIGATED NEGATIVE DECLARATION / ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to: (State) Division 13, California Public Resources Code and (Federal) 42 U.S.C. 4332(2)(C) and 49 U.S.C. 303

THE STATE OF CALIFORNIA
Department of Transportation
and the
Sonoma County Transportation Authority

Cooperating Agencies: U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers

Responsible Agencies: State Historic Preservation Officer, Regional Water Quality Control Board, and California Transportation Commission

Date

James E. Davis
Acting District Director
California Department of Transportation
CEQA/NEPA Lead Agency

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CALIFORNIA DEPARTMENT OF TRANSPORTATION
FINDING OF NO SIGNIFICANT IMPACT

FOR

STATE ROUTE 116/121 INTERSECTION IMPROVEMENTS PROJECT

The California Department of Transportation (Caltrans) and Sonoma County Transportation Authority (SCTA) have determined that the Roundabout Alternative will have no significant impact on the human environment. This Finding of No Significant Impact (FONSI) is based on the attached Environmental Assessment (EA), which has been independently evaluated by Caltrans and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an Environmental Impact Statement is not required. Caltrans takes full responsibility for the accuracy, scope, and content of the attached EA.

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried out by Caltrans pursuant to 23 United States Code 327 and the Memorandum of Understanding dated December 23, 2016, executed by the Federal Highway Administration and Caltrans.

Date 4/4/18

James E. Davis
Acting District Director
California Department of Transportation
District 4
CEQA/NEPA Lead Agency
MITIGATED NEGATIVE DECLARATION

Pursuant to: Division 13, Public Resources Code

Project Description

The California Department of Transportation (Caltrans) and the Sonoma County Transportation Authority (SCTA) propose to improve operations for vehicles, bicycles, and pedestrians where State Route (SR) 116 and SR 121 intersect, consequently reducing congestion and the occurrence of accidents. Additionally, where possible, the project would maintain and enhance access to adjacent properties and parking for public transit and carpool users.

Determination

Caltrans has prepared an Initial Study for this project and, following public review, has determined from this study that the proposed project would not have a significant effect on the environment for the following reasons:

The proposed project would have no effect on coastal zone; wild and scenic rivers; timberlands; growth; parks and recreational facilities; community impacts; population and housing; hydrology and floodplains; mineral resources; and plant species. In addition, the proposed project would have less than significant effects to land use and planning; farmlands; property acquisitions; traffic and transportation; utilities and emergency services; visual/aesthetics; cultural resources; water quality and stormwater runoff; geology, soils, and seismicity; paleontology; hazardous materials/waste; air quality; noise; natural communities; animal species; threatened and endangered species; invasive species; and cumulative impacts.

With the following mitigation measures incorporated, the proposed project would have less than significant effects to wetlands, native trees, and California red-legged frog upland dispersal habitat:

- Native trees removed will be replanted at least 1:1 ratio.
- Permanently impacted wetlands will be replaced at a 1:1 ratio.

Impacted California red-legged frog upland dispersal habitat will be mitigated through the purchase of California red-legged frog credits from a U.S. Fish and Wildlife Service-approved conservation bank, habitat restoration in Sonoma County; contribution to a larger advanced mitigation property acquisition in Sonoma County; habitat management; or other beneficial measure that will aid local recovery of the species.

James E. Davis
District 4
California Department of Transportation

Date 4/4/18
Summary

California participated in the “Surface Transportation Project Delivery Pilot Program” (Pilot Program) pursuant to 23 United States Code (U.S.C.) 327, for more than 5 years, beginning July 1, 2007, and ending September 30, 2012. MAP-21 (Moving Ahead for Progress in the 21st Century) (Public Law [P.L.] 112-141), signed by President Barack Obama on July 6, 2012, amended 23 U.S.C. 327 to establish a permanent Surface Transportation Project Delivery Program. As a result, the California Department of Transportation (Caltrans) entered into a Memorandum of Understanding (MOU) pursuant to 23 U.S.C. 327 (National Environmental Policy Act [NEPA] Assignment MOU) with the Federal Highway Administration. The NEPA Assignment MOU became effective October 1, 2012, and was renewed on December 23, 2016, for a term of 5 years. In summary, Caltrans continues to assume Federal Highway Administration responsibilities under NEPA and other federal environmental laws in the same manner as was assigned under the Pilot Program, with minor changes. With the NEPA Assignment MOU, the Federal Highway Administration assigned and Caltrans assumed all of the U.S. Department of Transportation Secretary's responsibilities under NEPA. This assignment includes projects on the State Highway System and Local Assistance Projects off of the State Highway System within the State of California, except for certain categorical exclusions that the Federal Highway Administration assigned to Caltrans under the 23 U.S.C. 326 Categorical Exclusion Assignment MOU, projects excluded by definition, and specific project exclusions.

The project is located in unincorporated Sonoma County at the intersection of State Route (SR) 116/SR 121/Arnold Drive/Bonneau Road (SR 116 Post Miles 46.0 to 46.7 and SR 121 Post Miles 5.8 to R7.4). The project proposes to improve operations for all modes of transportation at a high-volume, four-way stop at the SR 116/121 intersection. The project would reduce congestion and the occurrence of accidents for vehicles, bicycles, and pedestrians, while maintaining and enhancing, where possible, access to adjacent properties, and parking for public transit and carpool users. The No Build Alternative and two build alternatives – a Roundabout Alternative and a Signalized Intersection Alternative – were considered. The Roundabout Alternative includes construction of a hybrid multilane roundabout with 180 degrees of the circulatory roadway having two lanes, a full right-turn bypass lane in the northbound direction, and a partial right-turn bypass lane in the westbound direction. The Signalized Intersection Alternative proposes to introduce a four-way traffic signal to the project intersection. Both build alternatives include construction of pedestrian and bicycle facilities.

This Initial Study/Environmental Assessment (IS/EA) addresses the proposed project’s potential to have impacts on the environment. Potential impacts and avoidance, minimization,
and/or mitigation measures are summarized in Table S-1 on the following pages. Resource areas that were determined to be less than significant with mitigation are biological resources (i.e., wetlands, tree removal, and California red-legged frog). These significance determinations are further discussed in the California Environmental Quality Act (CEQA) Checklist in Appendix A.
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<table>
<thead>
<tr>
<th>Affected Resource</th>
<th>No Build Alternative</th>
<th>Roundabout Alternative (Preferred Alternative)</th>
<th>Signalized Intersection Alternative</th>
<th>Project Features, Avoidance, Minimization, and/or Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use</td>
<td>No impacts.</td>
<td>The Roundabout Alternative would permanently convert 3.78 acres of land to transportation use, including 0.09 acre of diverse agriculture and 3.69 acres of land-intensive agriculture.</td>
<td>The Signalized Intersection Alternative would convert 4.14 acres of land to transportation use, including 0.15 acre of diverse agriculture, 3.73 acres of land-intensive agriculture, 0.02 acre of limited commercial land uses, and 0.24 acre of recreation/visitor-serving commercial land uses.</td>
<td>No avoidance, minimization, and/or mitigation measures are required.</td>
</tr>
<tr>
<td>Consistency with State, Regional, and Local Plans and Programs</td>
<td>The No Build Alternative is not consistent with regional and local land use policies.</td>
<td>The build alternatives are mostly consistent with planning goals and policies in local and regional plans and studies. The only policy with which the build alternatives would be inconsistent with local plans relates to the protection of agricultural land. The build alternatives would be consistent with the other stated objectives of these jurisdictions.</td>
<td>No avoidance, minimization, and/or mitigation measures are required.</td>
<td></td>
</tr>
<tr>
<td>Farmlands</td>
<td>No impacts.</td>
<td>The Roundabout Alternative would result in the direct conversion of 1.47 acres of Farmland of Local Importance.</td>
<td>The Signalized Intersection Alternative would result in the direct conversion of 1.57 acres of Farmland of Local Importance.</td>
<td>No avoidance, minimization, and/or mitigation measures are required.</td>
</tr>
<tr>
<td>Acquisitions</td>
<td>No impacts.</td>
<td>The build alternatives would not affect any residential properties. Partial acquisitions of commercial properties and agricultural land would be required under both build alternatives.</td>
<td>Access to all properties will be maintained during construction.</td>
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<tr>
<td>Utilities and Emergency Services</td>
<td>No impacts.</td>
<td>No impacts.</td>
<td></td>
<td>Where feasible, relocations will be undertaken in advance of project construction. Coordination efforts with utility providers will include planning for utility reroutes. A Transportation Management Plan will be developed to address impacts to emergency services. A public education campaign will be implemented to inform area drivers, bicyclists, pedestrians, and residents about the new roundabout, including information on how drivers should respond when emergency vehicles are approaching the roundabout.</td>
</tr>
<tr>
<td>Traffic and Transportation, Pedestrian and Bicycle Facilities</td>
<td>The No Build Alternative would not add pedestrian and bicycle facilities or modify the existing Park and Ride lot. Under future no build conditions, intersection delay and level of service (LOS) would continue to worsen. By 2040, the wait time for traffic to cross the intersection would worsen from approximately 5 minutes to approximately 10 minutes in the morning peak hour, and from approximately 6 minutes to approximately 12 minutes in the evening peak hour.</td>
<td>The existing Park and Ride lot in the southeast quadrant at the SR 116/121 intersection would be relocated to the northeast quadrant of the intersection. Pedestrian and bicycle facilities would be added. By 2040, the Roundabout Alternative would provide acceptable LOS conditions for the morning and evening peak period, accommodate queue lengths, and reduce the delay by approximately 4 minutes, 51 seconds per vehicle in the morning peak hour and by approximately 5 minutes, 56 seconds per vehicle in the evening peak hour.</td>
<td>The existing Park and Ride lot at the SR 116/121 intersection would be reconfigured in its current location in the southeast quadrant. Pedestrian and bicycle facilities would be added. By 2040, this alternative would provide acceptable LOS conditions for the morning and evening peak period, accommodate queue lengths, and reduce the delay by approximately 4 minutes, 22 seconds per vehicle in the morning peak hour and by approximately 5 minutes, 14 seconds per vehicle in the evening peak hour.</td>
<td>A Transportation Management Plan will be developed and implemented as part of the project construction planning phase. In addition, if a full closure of the existing Park and Ride lot is required, Caltrans will redirect patrons to other Park and Ride lots.</td>
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<tr>
<td>Visual/Aesthetics</td>
<td>No Impacts.</td>
<td>The Roundabout Alternative would result in visual changes from widening the intersection, shifting the intersection to the northeast, relocating the existing Park and Ride lot to the northeast quadrant, tree removal, and the addition of pedestrian and bicycle facilities, lighting, and signage. Temporary visual impacts would also result from construction activities.</td>
<td>The Signalized Intersection Alternative would result in visual changes from widening the intersection, tree removal, and the addition of pedestrian and bicycle facilities, lighting, and signal poles. Temporary visual impacts would also result from construction activities.</td>
<td>Vegetation will be preserved to the extent feasible, and removed trees will be replaced in-kind (native oaks will be replanted at a 1:1 ratio). Decorative paving and fencing and barriers will be installed. Stormwater treatment facilities will be designed so that they appear to be a natural landscape feature.</td>
</tr>
<tr>
<td>Cultural Resources</td>
<td>No Impacts.</td>
<td>One National Register of Historic Places-eligible property was identified within the archaeological or historical areas of potential effect – the Vineyard Inn Hotel. The Roundabout Alternative would only acquire land from this property temporarily, and the acquisition would not adversely affect the Vineyard Inn Hotel. No archaeological resources were identified, and there is a low potential for buried archaeological sites within the archaeological area of potential effects; therefore, the Roundabout Alternative</td>
<td>One National Register of Historic Places-eligible property was identified within the archaeological or historical areas of potential effect – the Vineyard Inn Hotel. The Signalized Intersection Alternative would acquire land from this property permanently and temporarily; however, it would not adversely affect the Vineyard Inn Hotel because there would be no impacts to buildings on the property or other contributing elements. No archaeological resources were identified, and there is a low potential for buried archaeological sites within</td>
<td>The Secretary of the Interior’s Standards for the Treatment of Historic Properties Action Plan will be implemented to protect the Vineyard Inn Hotel during construction. The Phased Identification Plan, which will include additional survey and appropriate identification efforts, will be implemented to complete identification of archaeological resources in the unsurveyed northeast parcel. If cultural materials are discovered during construction, earth-moving activities will be stopped at that location until an archaeologist can assess the find. If human remains are discovered, the procedures described in State law will be implemented.</td>
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<tr>
<td>No Build Alternative</td>
<td>would have no adverse effect on cultural resources.</td>
<td>the archaeological area of potential effects; therefore, the Signalized Intersection Alternative would have no adverse effect on cultural resources.</td>
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<tr>
<td>Roundabout Alternative</td>
<td></td>
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<tr>
<td>Signalized Intersection</td>
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<tr>
<td>Alternative</td>
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<tr>
<td>Hydrology and Floodplain</td>
<td>The No Build Alternative may have potential permanent water quality impacts due to increased congestion, leading to a greater deposition of particulates from exhaust and heavy metals from braking.</td>
<td>No avoidance, minimization, and/or mitigation measures are required.</td>
</tr>
<tr>
<td>Water Quality and Stormwater Runoff</td>
<td>Potential temporary impacts to water quality may include vegetation removal and stormwater runoff from road construction and increases in sediment-laden flow into water bodies. Based on existing conditions, permanent impacts would increase the potential for stormwater runoff and soil erosion due to the net increase of impervious surfaces by 1.03 acres under the Roundabout Alternative.</td>
<td>Best management practices are considered project features and will be included to prevent adverse changes in downstream water quality. Measures will include feasible temporary and permanent (i.e., post-construction) best management practices. Pollution and erosion control measures will be incorporated. A Stormwater Pollution Prevention Plan will be implemented during construction.</td>
</tr>
<tr>
<td>Geology, Soils, and Seismicity</td>
<td>Earthquake shaking potential for this site is considered strong, and the risk of secondary seismic hazards to affect users of the intersection (i.e., liquefaction, seismically induced landslides, rock falls, settlement, and subsidence) is low.</td>
<td>Project elements will be designed and constructed to meet seismic design requirements for ground shaking and ground motions. A geotechnical investigation will be conducted to determine the engineering characteristics of native soil in undeveloped areas.</td>
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<tr>
<td>Paleontology</td>
<td>No impacts.</td>
<td>Ground-disturbing activities for both build alternatives would impact native material up to 3 feet below ground surface within the study area, with some locations requiring excavations up to 13 feet for utility poles. Earthwork to these depths would impact sensitive geological deposits (Late Pleistocene alluvium), but it is unlikely to affect significant paleontological resources.</td>
</tr>
<tr>
<td>Hazardous Waste and Materials</td>
<td>No impacts.</td>
<td>Three properties with known historical releases of hazardous materials are present within the study area. Aerially deposited lead from exhaust from leaded gasoline may occur near a highway or roadway. Subsurface construction activities could encounter petroleum hydrocarbons in shallow groundwater. Project activities would require removal of pavement and disturbance of the underlying soil within a commercial complex, and impacts could occur from exposure to hazardous materials associated with automotive repairs, fueling of vehicles, and other vehicle maintenance activities below the paved surface. The potential for environmental contamination from pesticide usage in agricultural lands is also possible.</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Air quality would worsen in the study area under the No Build Alternative due to increased congestion, slower speeds, queuing, and delay times.</td>
<td>Neither of the build alternatives would increase emissions of criteria air pollutants or precursors (i.e., ozone, carbon monoxide, sulfur dioxide, particulate matter, nitrogen dioxide, and lead) relative to the No Build Alternative in the vicinity of the SR 116/121 intersection. A much greater reduction would occur under the Roundabout Alternative. Project construction would generate fugitive (airborne) dust and exhaust emissions that would have direct temporary effects on local air quality.</td>
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<td>Noise</td>
<td>No impacts.</td>
<td>Future noise levels under the build alternatives approach or exceed the noise abatement criteria at one receptor in 2040; therefore, consideration of noise abatement is required. Construction activities could at times generate noise levels higher than existing traffic noise levels. A soundwall has been identified as feasible based on the acoustical design goal in one location; however, it was found not reasonable from a cost perspective. Temporary construction-related noise and vibration will be reasonably minimized by implementing measures such as noise monitoring, noise testing and inspection of equipment, and restricting construction activities to daytime hours when feasible.</td>
</tr>
<tr>
<td>Natural Communities</td>
<td>No impacts.</td>
<td>Approximately 36 native and 74 non-native trees would be removed. Permanently impacted habitat would include 8.76 acres of urban, 3.09 acres of landscaped, 1.77 acres of annual grassland, 0.06 acre of eucalyptus, and 1.50 acres of wetlands, for a total of 15.18 acres. Construction activities would temporarily impact 0.41 acre of urban, 0.08 acre of landscaped, 1.16 acre of annual grassland, and 0.08 acre of eucalyptus, for a total of 1.73 acres. Approximately 49 native and 89 non-native trees would be removed. Permanently impacted habitat would include 10.14 acres of urban, 3.57 acres of landscaped, 0.02 acre of annual grassland, 0.10 acre of eucalyptus, and 1.53 acres of wetlands, for a total of 15.36 acres. Construction activities would temporarily impact 0.40 acre of urban, 0.22 acre of landscaped, 1.80 acres of annual grassland, 0.03 acre of eucalyptus, and 0.21 acre of wetlands, for a total of 2.66 acres. Existing native vegetation will be preserved to the greatest extent feasible. Native trees removed will be replanted at least 1:1 ratio within the relocated Park and Ride lot under the Roundabout Alternative or along SR 116/Arnold Drive and SR 121/Fremont Drive under the Signalized Intersection Alternative. Environmentally sensitive areas will be delineated; disturbed areas will be replanted, reseeded, and restored; wildlife exclusion fencing will be installed; and best management practices will be implemented. An environmental awareness training program will be implemented for project personnel.</td>
</tr>
<tr>
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</tr>
<tr>
<td>Wetlands and Other Waters of the United States</td>
<td>No impacts.</td>
<td>This alternative would result in permanent impacts to 1.50 acres of wetlands. There would be no direct impacts to Yellow Creek.</td>
</tr>
<tr>
<td>Plant Species</td>
<td>No impacts.</td>
<td>Special-status plant species were not observed in the study area during surveys; therefore, impacts are not anticipated. However, a portion of the study area was not surveyed due to access restrictions. When the inaccessible parcel northeast of the intersection becomes accessible to biologists, seasonally timed special-status plant surveys would occur prior to project construction. If special-status plant species are observed during these surveys, potential direct impacts could occur during construction due to ground-disturbing activities and installation of impervious surfaces, primarily associated with work in the northeast quadrant.</td>
</tr>
<tr>
<td>Animal Species</td>
<td>No impacts.</td>
<td>Direct impacts to individual western pond turtles may result from relocation efforts and earth-moving activities in potential habitat during construction of the build alternatives. Indirect impacts may result from water-quality degradation from erosion or sediment-loading due to construction activities. Vegetation removal could affect migratory birds, such as nesting raptors, through temporary habitat removal. The removal of large trees within the project area that may provide suitable roosting habitat could cause a temporary impact on roosting bats, including the pallid bat.</td>
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<td>Threatened and Endangered Species</td>
<td>No impacts.</td>
<td>Contra Costa goldfields and Sonoma sunshine could be impacted during grading of the project area. Vernal pool fairy shrimp and California red-legged frog could be injured or killed by construction-related personnel or equipment during project construction if these species enter or are found in the work area. Due to the project's increases in pervious and impervious surface area, permanent and temporary impacts to California red-legged frog upland dispersal habitat would occur. Listed species could also be injured or killed by construction-related personnel or equipment during project construction if listed species enter or are found in the work area. It should be noted that a portion of the study area was not surveyed due to access restrictions. Species assumed to be present until surveys are conducted include vernal pool fairy shrimp, Contra Costa goldfields, and Sonoma sunshine.</td>
<td>When the undeveloped field northeast of the intersection becomes accessible to biologists, seasonally timed special-status plant surveys and surveys for vernal pool fairy shrimp will occur prior to project construction. If protected species are discovered, California Department of Fish and Wildlife or U.S. Fish and Wildlife Service coordination and protective measures will be established. Compensatory mitigation will be required for the potential permanent loss of California red-legged frog upland dispersal habitat. Additionally, general avoidance and minimization measures will be implemented to protect California red-legged frogs.</td>
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</tbody>
</table>

The start of construction for activities occurring during the nesting season (February 1 to September 30). If an active nest of a raptor, game, or non-game bird is found, a no work zone buffer will be established to minimize disturbance. The Caltrans biologist will coordinate with California Department of Fish and Wildlife and U.S. Fish and Wildlife Service for appropriate biological monitoring and the establishment of an adequate buffer.
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<tr>
<td>Invasive Species</td>
<td>No impacts.</td>
<td>Project landscaping and erosion control will avoid using species listed as noxious weeds. The contractor will be required to use equipment that is cleaned and inspected for plant material prior to arrival and use at the project site. A wash station will be established or designated so that equipment is free of soil tracked from other sites that may harbor invasive plant seeds prior to the deployment of equipment onto the site.</td>
</tr>
<tr>
<td>Cumulative Impacts</td>
<td>No impacts.</td>
<td>The resources identified for cumulative analysis would not result in cumulative impacts; therefore, the build alternatives would not result in cumulative impacts. No project features, avoidance, minimization, and/or mitigation measures are required.</td>
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The California Department of Transportation (Caltrans) and Sonoma County Transportation Authority (SCTA) propose to improve traffic operations at the State Route (SR) 116/121 intersection in unincorporated Sonoma County.

Caltrans is the lead agency under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans has been assigned environmental review and consultation responsibilities under NEPA pursuant to 23 United States Code (U.S.C.) 327. The project is proposed in cooperation with SCTA, which is responsible for providing regional funding.

1.1 Introduction

The project is located in Sonoma County at the intersection of SR 116/SR 121/Arnold Drive/Bonneau Road. This intersection is the southern terminus of SR 116, which is the north “leg” of the intersection and, in the project vicinity, is also called Arnold Drive. SR 121 makes a right angle at this intersection, so that the south and east legs of the intersection are both SR 121. In the project vicinity, SR 121 is also called Arnold Drive south of the intersection, and it is called Fremont Drive east of the intersection. Bonneau Road, a county road, is the west leg of the intersection. There is an existing Park and Ride lot located in the southeast quadrant of the intersection, and while the project vicinity is predominantly rural, there are some commercial uses surrounding the intersection, as well as farmland. Figure 1-1 provides a project vicinity map, and Figure 1-2 provides a project location map.

Within the limits of the proposed project, SR 116 and SR 121 are conventional two-lane highways with 10- to 12-foot-wide lanes and zero- to 8-foot-wide shoulders. Bonneau Road is a two-lane county road with 10-foot-wide lanes and no shoulders. Currently, this intersection is a four-way, stop-sign controlled intersection with a flashing red beacon in the middle of the intersection. Both highways support commuter, residential, commercial, and tourist traffic. Caltrans proposes to improve operations for vehicles, bicycles, and pedestrians at this intersection through the implementation of a roundabout or a signal.

This project is included in the Metropolitan Transportation Commission’s most recent Regional Transportation Plan, Plan Bay Area 2040 (Regional Transportation Plan ID No. 22190). The project is also included in the 2015 Transportation Improvement Program, which was adopted by the Metropolitan Transportation Commission on September 24, 2014 (Transportation Improvement Program ID No. SON150009). The Federal Highway Administration and Federal Transit Administration approved the 2015 Transportation Improvement Program on December 15, 2014.
Figure 1-1: Project Vicinity Map
1.2 Purpose and Need

1.2.1 Project Purpose

The purpose of this project is to accomplish the following at the SR 116/121 intersection:

- Improve operations for vehicles, bicycles, and pedestrians;
- Reduce congestion;
- Reduce occurrences of accidents;
- Maintain and enhance access to adjacent properties; and
- Where possible, maintain and enhance parking for public transit and carpool users.

1.2.2 Project Need

The SR 116/121 intersection, in the existing condition with a four-way stop, has decreased its ability to function operationally as the junction of two state highways because traffic on both highways has increased significantly since it was originally constructed. As a result, the intersection experiences congestion and high peak-hour delay due to high traffic volume and high turning movements. Existing (2014) delay is 5 minutes in the morning peak hour (7:30 to
8:30 a.m.) and 6 minutes in the evening peak hour (4:30 to 5:30 p.m.). It is currently operating at unacceptable level of service (LOS) E and F under existing year 2014. LOS E denotes heavy traffic, and LOS F denotes stop-and-go conditions. The most recent 3-year accident data available, October 1, 2010 – September 30, 2013, show a higher than average total accident rate on SR 121 at the project location (Caltrans Traffic Accident Surveillance and Analysis System-Transportation System Network [TASAS/TSN], 2015). In addition, the design of the existing intersection does not adequately accommodate pedestrians and bicyclists. Other needs have been identified, including the need to continue to support ride-sharing and access to public transit use at the intersection, and the needs expressed by residents and businesses regarding ingress and egress to properties adjacent to the project area.

### 1.2.2.1 Capacity, Transportation Demand, and Safety

Caltrans has documented high traffic volumes and delays at the SR 116/121 intersection in traffic studies and transportation planning documents dating back to 1997 (Caltrans, 2013a). SR 116 is a two-lane conventional highway contained entirely within Sonoma County that ends at SR 121 at the project site. Vehicular traffic on SR 116 is primarily commuter and commercial truck traffic, with some recreational traffic consisting of visitors to the Sonoma and Napa wine region. SR 121 is also a two-lane conventional highway that crosses Sonoma and Napa counties. Traffic on SR 121 is recreational, commuter, and commercial. SR 121 experiences additional traffic generated by attendees to special events at the nearby Sonoma Raceway, located approximately 6 miles to the south on SR 121.

According to the *Traffic Operations Analysis Report*, the study intersection is currently operating at unacceptable LOS E and F under existing year 2014. LOS is a rating of congestion and varies on a scale from LOS A to LOS F, where LOS A represents stable flow and very slight delay, and LOS E represents unstable flow, poor progression, and long cycle lengths. At LOS F, an intersection is considered over capacity and operates at forced-flow, jammed conditions. Figure 2.1-7 in Section 2.1.5 shows the LOS scale for an unsignalized intersection, which has the same delay categories as a four-way stop intersection. The wait time for traffic to cross the intersection is currently approximately 5 minutes in the morning peak hour (7:30 to 8:30 a.m.) and approximately 6 minutes in the evening peak hour (4:30 to 5:30 p.m.). For future years, conditions are projected to worsen based on the overall intersection delay and the corresponding LOS. The wait time for traffic to cross the intersection worsens from approximately 5 minutes to approximately 10 minutes in the morning peak hour, and from approximately 6 minutes to approximately 12 minutes in the evening peak hour by 2040. High traffic volume in the project intersection can also cause difficult ingress and egress at adjacent and nearby properties, as vehicles must wait for a safe break in traffic flow to complete their turn onto or off of SR 121 and SR 116.
The most recent accident data available (from years 2010 – 2013), shown in Table 1-1, show a higher than average total accident rate on SR 121 at the project location (Caltrans TASAS/TSN, 2015). Total accident rates are approximately 24 percent higher on SR 116 than the statewide average and 41 percent higher on SR 121 than the statewide average for similar facilities. Preliminary analysis of the accident data indicates that up to 33 percent of accidents on SR 116 and up to 50 percent of accidents on SR 121 were congestion related. Vehicles often enter the northbound-to-eastbound free right turn off of SR 121 at high speeds, posing safety hazards (Caltrans, 2013a).

### Table 1-1: Number of Accidents and Rates (October 1, 2010, to September 30, 2013)

<table>
<thead>
<tr>
<th>Main Line Highway Segments</th>
<th>Number of Accidents/Significance</th>
<th>Accident Rates*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tot</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>F+I</td>
</tr>
<tr>
<td>1 Son 116 PM 44.84/46.755</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>2 Son 121 PM 5.6/R7.438</td>
<td>59</td>
<td>0</td>
</tr>
</tbody>
</table>

*Number of Accidents/Million Vehicle Miles; F= Fatal; F+I= Fatal +Injury; Tot=total

**Bold underlined numbers** reflect higher-than-average accident rates.

### 1.2.2.2 Roadway Deficiencies

The existing intersection has many roadway, pedestrian, and bicycle facility deficiencies. The intersection has limited facilities for pedestrians. The intersection lacks sidewalks, with the exception of a short stretch of sidewalk at the southwest corner of the intersection along SR 121. The four-way intersection has a single crosswalk, which crosses SR 121 at the south end of the intersection. This crosswalk connects the existing Park and Ride lot to the bus stop on the west side of the highway. The other three intersection legs lack a crosswalk, and all intersection legs lack other pedestrian infrastructure such as controlled crossings with countdown signals, pedestrian-scale lighting, accessible pedestrian signals, and Americans with Disabilities Act-compliant features. The transit stops located adjacent to the intersection lack a pedestrian refuge or designated patron waiting area.

Other roadway deficiencies include the nonstandard lanes and shoulders on SR 116 and SR 121, particularly along SR 121 at the southern end of the project limits and the free right
turn at Fremont Drive from SR 121. The project limits are defined as the limits of the proposed improvements for the build alternatives. In addition, access to properties adjacent to the intersection is challenging.

There is a need for improved nighttime lighting and additional street and highway signage at the project intersection. There are limited directional signs, and there are no signs to indicate Arnold and Fremont drives. Lastly, there is a lack of bicycle facilities at the project intersection and intersection approaches. This presents challenges for bicyclists using the existing intersection and may discourage the use of bicycles in the area.

1.2.2.3 Social Demands and Economic Development

According to the *Sonoma County General Plan 2020* (September 2008), SR 116 and SR 121 are important traffic arteries in the Sonoma Valley region, defined as the area that extends from Bennett Valley and Kenwood south to San Pablo Bay and from the crest of the Sonoma Mountains east to the Sonoma-Napa county line. Sonoma Valley is heavily impacted by recreational travel. The valley’s wine industry and its proximity to the Bay Area result in significant weekend congestion, particularly during summer months and harvest season, which begins in September and goes through October. Special event activity, including from the nearby Sonoma Raceway, also contributes to this traffic. The growth in demand for tourist-serving uses particularly affects SR 121; thus, it is projected to become more congested, especially during weekend peak periods (Caltrans, 2013a). The *Sonoma County General Plan* includes planned improvements at the SR 116/121 intersection to reduce congestion and to address pedestrian and safety issues. In addition, the goals of the SCTA 2014 Measure M Strategic Plan (SCTA, 2014a), the 2009 Comprehensive Transportation Plan for Sonoma County, and the Metropolitan Transportation Commission’s Regional Transportation Plan, *Plan Bay Area 2040* (MTC, 2013) include improving traffic conditions, reducing congestion, and improving pedestrian and bicycle facilities in the region. There are no planned land use changes or growth management controls in the vicinity of the SR 116/121 intersection.

1.2.2.4 Legislation

On November 2, 2004, the voters of Sonoma County passed Measure M, a ¼ cent sales tax to address transportation needs throughout the county. On June 11, 2005, the SCTA Board of Directors approved the 2005 Measure M Strategic Plan, which is a 5-year programming document outlining how money generated from the sales tax would be spent on transportation needs.

The Measure M Strategic Plan provides a snapshot of anticipated tax revenue and commitment of funds to specific transportation projects for the following 5 years. The Measure M Strategic Plan has been updated four times since 2005. The proposed SR 116/121 Intersection
Improvements Project is identified in the 2014 Measure M Strategic Plan, which programmed $1.95 million, of the total $5 million available, of Measure M funds for the proposed project.

1.2.2.5 Modal Relationships and System Linkages

In the southeast quadrant of the SR 116/121 intersection, there is an existing Caltrans-operated Park and Ride lot with 47 spaces. This Park and Ride lot supports ride-sharing by residents in the local area, and it serves two bus stops for Sonoma County Transit Line 38, located just south of the intersection. Line 38 travels from San Rafael to Oakmont (east of Santa Rosa), and there is one bus trip in the morning and one bus trip in the afternoon. Sonoma County Transit Line 32 also passes through this intersection, with a stop to the east on South Temelec Circle. Line 32 travels from Temelec (located approximately 3 miles north of the SR 116/121 intersection), through Sonoma, and north to Agua Caliente throughout the day. This Park and Ride lot is the only lot serving the Sonoma Valley, and it is an important element of maintaining and improving multimodal connections in the region. Retaining the existing Park and Ride lot at the project intersection would support any future plans to expand transit service through this area.

Additionally, the 2014 Sonoma County Bicycle and Pedestrian Plan identifies two high-priority projects to accommodate bicyclists and pedestrians within the study area. One high-priority project calls for Class II bicycle lanes to be created on SR 121 between Bisso and Napa roads, which provide a striped lane for one-way bicycle travel on a street or highway. The second high-priority project calls for Class II bicycle lanes along SR 116 between Adobe Road and SR 121. Improving bicycle and pedestrian facilities within the vicinity of the SR 116/121 intersection would support the goals of this plan.

Furthermore, the proposed project would be designed to accommodate high volumes of heavy trucks passing through the intersection to support continued goods movement and truck circulation throughout Sonoma Valley.

Lastly, the proposed SR 116/121 Intersection Improvements Project is Phase 3 of the 5-phase SR 116/121 Intersection Improvements and Arnold Drive Improvements identified in the 2014 Measure M Strategic Plan. Phases 1 and 2 included improvements along Arnold Drive and were completed in 2012 and 2014, respectively. Phase 4 is to widen the shoulders on Arnold Drive between Country Club Drive and Loma Vista Drive, and Phase 5 is to replace the existing stop-controlled intersection at Arnold Drive and Madrone Avenue with a signalized intersection or roundabout. No work has started on Phases 4 and 5. The current proposed project (Phase 3) is an important component of the overall system of improvements planned for Arnold Drive.
1.2.3 Independent Utility and Logical Termini

Federal Highway Administration regulations (23 Code of Federal Regulations [CFR] 771.111[f]) require that the project evaluate:

- If the proposed project has logical termini,
- If the proposed project has independent utility, and
- Does not restrict the consideration of alternatives for other transportation improvements.

The Federal Highway Administration defines logical termini as rational end points for a transportation improvement and rational end points for a review of environmental impacts for the transportation improvement. The proposed project possesses logical termini because the project focuses on improvements to the SR 116/121 intersection and the existing, adjacent Park and Ride lot, and the project limits include the intersection, intersection approach, and Park and Ride lot. The proposed improvements would not restrict the consideration of alternatives for other reasonably foreseeable transportation improvements. The proposed project is being developed with the local and regional transportation authorities in the area, SCTA, and Caltrans. Continuing coordination will avoid potential conflicts with alternatives for this project and for other planned area transportation improvements.

Independent utility is an FWHA requirement that highway projects are usable and a reasonable expenditure even if no additional transportation improvements in the area are made. The Federal Highway Administration states that “as long as a project will serve a significant function by itself (i.e., it has independent utility), there is no requirement to include separate but related projects in the same analysis.” The proposed project has independent utility, in that the proposed intersection improvements are enough to ensure that no additional investment would be required as a result of project completion.

1.3 Project Description

This section describes the proposed action and the project alternatives developed to meet the identified purpose and need of the project, while avoiding or minimizing environmental impacts. The three alternatives include the Roundabout Alternative, Signalized Intersection Alternative, and No Build Alternative.

The project is located in Sonoma County at the intersection of SR 116/SR 121Arnold Drive/Bonneau Road (SR 116 Post Miles 46.0 to 46.7 and SR 121 Post Miles 5.8 to R7.4). Within the limits of the proposed project, SR 116 and SR 121 are conventional two-lane highways with 10- to 12-foot-wide lanes and zero- to 8-foot-wide shoulders. Bonneau Road is a two-lane county road with 10-foot-wide lanes and no shoulders. The purpose of this project is to improve operations for motorists, bicycles, and pedestrians at the SR 116/121 intersection, consequently
reducing congestion and the occurrence of accidents. Additionally, where possible, the project would maintain and enhance access to adjacent properties and parking for public transit and carpool users.

Project features include design elements of the project and standardized measures that are applied to all or most Caltrans projects, including Best Management Practices, Caltrans Standard Specifications, and Standard Special Provisions. The features are considered an integral part of the project and have been considered prior to any significance determinations for CEQA.

1.4 Alternatives

Three project alternatives are proposed for consideration, as described below. Two build alternatives – the Roundabout Alternative and the Signalized Intersection Alternative – were developed to meet the identified purpose and need of the project, while avoiding or minimizing environmental impacts. The third alternative is the No Build Alternative. The alternatives will be evaluated based on project cost, vehicle miles traveled, and other traffic data. Impacts to the environment, such as community and land use impacts, cultural resources, floodplains, wetlands, greenhouse gas emissions, and special-status species, will also be evaluated. The general project vicinity is shown in Figure 1-1; the specific project location is shown in Figure 1-2.

1.4.1 Roundabout Alternative

The Roundabout Alternative includes construction of a hybrid multilane roundabout with 180 degrees of the circulatory roadway having two lanes, a full right-turn bypass lane in the northbound to eastbound direction, and a partial right-turn bypass lane (yield control at the exit) in the westbound direction. The provision of a full right-turn bypass lane allows right-turning traffic to bypass the roundabout and merge onto the exit roadway. A partial right-turn bypass also bypasses the roundabout, but provides a yield control at the exit roadway instead of a separate merge lane. The Roundabout Alternative extends approximately 750 feet on SR 116/Arnold Drive (north of the intersection), approximately 1,600 feet on SR 121/ Fremont Drive (east of the intersection), approximately 800 feet on SR 121/Arnold Drive (south of the intersection), and approximately 200 feet on Bonneau Road (west of the intersection). The Roundabout Alternative is shown in Figures 1-3 and 1-4.

The full right-turn bypass lane would be in the southeast quadrant for motorists traveling northbound on SR 121/Arnold Drive to SR 121/Fremont Drive. The partial right-turn bypass lane would be in the northeast quadrant for motorists traveling from westbound SR 121/ Fremont Drive and connecting to northbound SR 116/Arnold Drive. SR 116/Arnold Drive, SR 121/Arnold Drive, and SR 121/Fremont Drive would have 12-foot-wide lanes, except when they would approach the roundabout, at which point they would widen to between 12 and 19
feet. Within the roundabout, lane widths would range between 12 and 20 feet. Bonneau Road would be widened and realigned to accommodate standard, 12-foot-wide single-entry and single-exit lanes with 2-foot-wide shoulders. Flashing beacons and advance warning signs would be installed as appropriate to alert approaching motorists to slow down from the approaching speed of 50 miles per hour (mph) to the entering speed of 25 mph. The existing free right turn from northbound SR 121/Arnold Drive eastbound to SR 121/Fremont Drive would be removed. The Roundabout Alternative has an escalated (2019) total cost estimate of $15.43 million with $4.79 million for right-of-way (ROW) acquisition, environmental mitigation, and roadway construction costs.

**Pedestrian and Bicycle Facilities**

The highway shoulders would be striped and signed as Class II bicycle lanes, which would terminate at the roundabout. Bicyclists using the Class II bicycle lanes would have the option of merging into the mixed-flow lanes with circulatory traffic or leaving the bicycle lanes via a bicycle ramp and using the Class I 10-foot-wide shared-use path. This shared-use path would serve as a shared pedestrian/bicyclist facility for the approach, passage through, and exit of the roundabout. It would be constructed to surround the roundabout at each roadway crossing. No bicycle lanes are proposed on Bonneau Road because the roadway terminates at a dead end approximately 1 mile east of the intersection.

Each roadway crossing of the shared-use path would include a striped crosswalk, pedestrian–scale lighting, and signage to alert motorists to the presence of pedestrians and bicyclists. All paths, ramps, and crossings would be built to meet current Americans with Disabilities Act standards. These standards include, but are not limited to, paths not exceeding a maximum slope of 5 percent. To increase pedestrian visibility and motorist yielding rates, rectangular rapid flashing beacons will be considered and further evaluated during the design phase of the project for wherever pedestrians cross two lanes of same-direction travel.

In addition, a 5-foot-wide strip separating the path from the roundabout traffic lanes would be constructed along all four legs of the intersection to provide a division between the traffic lanes and the shared-use path.

**Partial Property Acquisitions**

Construction of the roundabout would require partial acquisition of adjacent properties. The roundabout center would be located northeast of the existing intersection center to minimize ROW impacts to local businesses. No businesses or residences would be displaced. Temporary construction easements would also be required to facilitate construction of the project. The temporary work would include access onto project frontages to construct project-related features, including relocating utilities, and constructing drainage and the new shared-use path.
Figure 1-3: Roundabout Alternative
Figure 1-4: Roundabout Alternative – Detail
**Park and Ride Lot**

The existing Park and Ride lot, currently located in the southeast quadrant of the existing intersection, would be removed to allow for the full right-turn bypass lane. The Park and Ride lot would be relocated to the northeast quadrant of the roundabout which would require ROW acquisition in northeast quadrant. Traffic ingress and egress to the Park and Ride lot would be provided off of SR 116/Arnold Drive and SR 121/Fremont Drive and would be set back from the highway and shared-use path of the proposed roundabout to accommodate traffic flow. The setback allows for a driveway area to be developed, thus providing a smooth flow of traffic into the existing Park and Ride lot. The relocated Park and Ride lot would have the same number of parking spaces (47) as the original lot, but the overall footprint of the lot would be larger, due to utility relocations, tree replanting, and water treatment measures. The new Park and Ride lot would be paved with impervious pavement. New stripping would be included and signage would be installed in the completed lot.

**Landscaping, Drainage, Access, and Utilities**

Existing landscape, drainage systems, and access would be redesigned to support the roundabout. Details of landscaping treatments and exact locations for landscaping opportunities would be designed in collaboration with Caltrans’ District Landscape Architect during the design phase. Utility relocations would be required for utility poles and underground storm drain facilities; no other underground utilities have been identified. A total area of approximately 100 square feet would be excavated for utility pole relocation, and the depth of these excavations would range from approximately 5 to 13 feet below grade. Of the 100 square feet, approximately 20 square feet would be excavated for light poles. Utility boxes would also be required at each curb return, which are located at the curved section of the curb at the corner of an intersection. They would be a maximum of 3 feet deep.

New and extended storm drains would tie into the existing storm drain system, and the depth of these excavations would generally be at the same depth as existing storm drain facilities. The Roundabout Alternative has been designed to avoid impacts to Yellow Creek Bridge, which is a concrete bridge supporting SR 121/Arnold Drive over Yellow Creek. The drainage improvements have been designed to mimic existing drainage patterns while accommodating the increased runoff anticipated as a result of the additional impervious surfaces created by the project. Drainage improvements would include construction of a biotreatment area at the Park and Ride lot in the northeast quadrant and areas in the northwest and southeast quadrants. Excavation and construction of new and extended storm drains are also planned. The project would not impact groundwater recharge due to the relatively small area of impervious surfaces relative to the size of the regional watershed groundwater basin.
Design Option 1: Interim Roundabout

The Interim Roundabout design option would also include construction of a hybrid multilane roundabout, which would be a phased version of the Roundabout Alternative. The Interim Roundabout design option would meet all of the objectives stated in the purpose and need. This design option would be initially constructed to allow drivers to become familiar with roundabout navigation and simplify movements. The ultimate Roundabout Alternative configuration would be built in a time horizon of approximately 10 to 15 years after construction of the interim design option. The National Cooperative Highway Research Program NCHRP Report 672, Roundabouts: An Informational Guide, 2010, recommends constructing roundabouts in their ultimate configuration while restricting the number of entering lanes and circulating lanes to what is needed for the near-term traffic volumes.

Under the Interim Roundabout design option, 90 degrees of the circulatory roadway would have two lanes (instead of two lanes for 180 degrees). Two partial right-turn bypass lanes would be provided, one in the southeast (instead of a full right-turn bypass) and one in the northeast quadrants. The project limits, ROW acquisition, and the area of impact would be the same as those described above for the Roundabout Alternative. The only difference between the Interim Roundabout and the Roundabout Alternative would be the number of lanes; the Interim Roundabout would be striped with one lane (except for 90 degrees that would be striped with two lanes), while the Roundabout Alternative would be striped with one or two lanes (180 degrees each), and the northbound full right-turn bypass is replaced by a partial right-turn bypass (i.e., yield at exit leg) with the Interim Roundabout.

Under the Interim Roundabout, the LOS is expected to remain at acceptable levels until approximately year 2030. When the projected traffic volumes result in unacceptable operations, consideration will be given to expand to the ultimate Roundabout configuration. When the ultimate Roundabout configuration is warranted, SCTA will program a job to restripe the roundabout to the ultimate hybrid multilane configuration. The Interim Roundabout design option is shown in Figures 1-5 and 1-6.

Construction Activities

Construction work for either build alternative would be done primarily during daylight hours from 7:00 a.m. to 6:00 p.m.; however, there may be some work during night-time hours to avoid temporary highway closures for tasks that could interfere with traffic or create safety hazards. Examples of these tasks include striping operations, traffic control setup, installation of storm drain crossings, and asphalt pavement mill and overlay. Project construction would occur over approximately 15 months.
Figure 1-5: Interim Roundabout Design Option
Figure 1-6: Interim Roundabout Design Option – Detail
Road Closures. The entire intersection would not be closed during construction; however, temporary lane closures would occur. It is anticipated that temporary closure of existing bicycle, transit, or pedestrian facilities would occur at times and may require temporary rerouting of transit service due to intersection work. A Transportation Management Plan would be developed and implemented as part of the project construction planning phase. The Transportation Management Plan would address potential impacts to circulation of all modes of travel (i.e., transit, bicycles, pedestrians, and private vehicles). Highway and/or pedestrian access to all occupied residences and businesses and respective parking lots would be maintained during project construction. The Transportation Management Plan would include measures to minimize, avoid, and/or mitigate impacts from temporary lane closures, such as agreements with local agencies to provide enhanced infrastructure on arterial roads or intersections to deal with additional traffic. The Transportation Management Plan may provide for employing traffic control personnel from another agency, especially for special event traffic through or near the construction zone.

Park and Ride Lot Closure. The existing Park and Ride lot would be partially, and potentially fully, closed during construction. Approximately 60 percent of the lot would remain open during portions of the construction period, while the remaining 40% of the lot would be used as a construction staging area. Approximately 28 spaces would remain open to accommodate carpool users. Full closure of the existing Park and Ride lot may be necessary for short periods of time due to construction activities in the southeast quadrant of the intersection, such as paving activities. Caltrans would redirect patrons to other associated lots if a full closure becomes necessary, such as the Petaluma, Lakeville Highway Park and Ride lot, located at Highway 101 and SR 116; South Petaluma Park and Ride lot, located at Highway 101 and South Petaluma Boulevard; or the Novato, Black Point Park and Ride lot, located at Route 37 and Atherton Avenue. The Transportation Management Plan will include measures to minimize, avoid, and/or mitigate impacts from diverting patrons to associated lots. As part of the project construction, the existing Park and-Ride lot will be replaced by a full right-turn bypass lane, and users would need to park in the new Park and Ride lot that will be built in the northeast quadrant of the roundabout. Patrons will be notified via information on SCTA’s website, and onsite signs that would direct users to the nearest Park and Ride lot. The Transportation Management Plan would include specific details on notifications and new signage for the new Park and Ride lot.

Staging Location. The anticipated construction staging areas available include areas within the existing roadway ROW construction limits, primarily inside the existing Park and Ride lot. It is anticipated that no staging areas outside of the existing roadway ROW and Park and Ride lot would be required.
Construction Equipment. Equipment, including but not limited to an auger drill rig, backhoe, compactor, concrete pump, crane, dozer, excavator, front end loader, grader, heavy-duty dump truck, jackhammer, vibratory roller, and pavement breaker, could be used during construction.

1.4.2 Signalized Intersection Alternative

The Signalized Intersection Alternative proposes to introduce a four-way traffic signal to the project intersection. The Signalized Intersection Alternative extends approximately 1,250 feet on SR 116/Arnold Drive (north of the intersection), approximately 1,650 feet on SR 121/Fremont Drive (east of the intersection), approximately 750 feet on SR 121/Arnold Drive (south of the intersection), and approximately 200 feet on Bonneau Road (west of the intersection).

The existing intersection would be widened to accommodate a configuration that would include an additional left-turn lane for traffic turning eastbound from SR 116/Arnold Drive and add an additional right-turn lane on northbound SR 121/Arnold Drive. SR 116/Arnold Drive and SR 121/Fremont Drive would have standard 12-foot-wide lanes. SR 121/Arnold Drive would have a 12-foot-wide lane. Bonneau Road would be widened to accommodate standard 12-foot-wide lanes and shoulders. All shoulders would be 8 feet wide, except adjacent to the westbound right-turn pocket, which would be 4 feet wide, and adjacent to the northbound right-turn pocket, which would be 6 feet wide, to avoid additional property acquisition.

Flashing beacons and advance warning signs would be installed as appropriate to alert approaching motorists to slow down. The existing free right turn on northbound SR 121/Arnold Drive would be removed. The Signalized Intersection Alternative is shown in Figures 1-7 and 1-8. The Signalized Intersection Alternative has an escalated (2019) total cost estimate of $14.29 million with $4.51 million for ROW acquisition, environmental mitigation costs, and roadway construction costs.

Pedestrian and Bicycle Facilities

New 6-foot-wide pedestrian sidewalks would be constructed for connectivity between the four intersection legs. All sidewalks and crossings would be Americans with Disabilities Act compliant. On the SR 116/Arnold Drive, SR 121/Arnold Drive, and SR 121/Fremont Drive intersection legs, bicycle lanes would be Class II compliant. No bicycle lanes are proposed on Bonneau Road because the roadway terminates at a dead end approximately 1 mile east of the intersection. Bicyclists would use the highway shoulders on the intersection approach. Through the intersection, bicyclists would have their own dedicated lane.

Partial Property Acquisition

Partial acquisition of properties adjacent to the intersection would be required under the Signalized Intersection Alternative. No businesses or residences would be displaced.
Figure 1-7: Signalized Intersection Alternative
Figure 1-8: Signalized Intersection Alternative – Detail
**Park and Ride Lot**

The existing Park and Ride lot, located in the southeast quadrant of the intersection, would remain in the southeast quadrant of the intersection and would be reconfigured. Access to the reconfigured Park and Ride lot would be from northbound SR 121/Arnold Drive, south of the intersection.

**Landscaping, Drainage, Access, and Utilities**

Existing landscape, drainage systems, and access would be slightly modified under the Signalized Intersection Alternative. Details of landscaping treatments and exact locations for landscaping opportunities would be designed in collaboration with Caltrans’ District Landscape Architect during the design phase. Utility relocations would be required for utility poles and underground storm drain facilities; no other underground utilities have been identified. The total area of approximately 100 square feet would be excavated for utility pole relocation, and the depth of these excavations would range from approximately 5 to 13 feet below grade. Of the 100 square feet, 40 square feet would be excavated for signal poles and 20 square feet would be excavated for light poles. Utility boxes would also be required at each curb return, at a maximum of 3 feet deep.

New and extended storm drains would tie into the existing storm drain system, and the depth of these excavations would generally be at the same depth as existing storm drain facilities. The Signalized Intersection Alternative has been designed to avoid impacts to Yellow Creek Bridge, which is a concrete bridge supporting SR 121/Arnold Drive over Yellow Creek.

**Construction Activities**

The description of construction activities under the Roundabout Alternative, above, also applies to the Signalized Intersection Alternative.

**1.4.3 Transportation System Management and Transportation Demand Management Alternatives**

Transportation System Management strategies increase the efficiency of existing facilities; they are actions that increase the number of vehicle trips a facility can carry without increasing the number of through lanes. Examples of Transportation System Management strategies include ramp metering, auxiliary lanes, turning lanes, reversible lanes, and traffic signal coordination. Transportation System Management also encourages automobile, public and private transit, ride-sharing programs, and bicycle and pedestrian improvements as elements of a unified urban transportation system. Transportation Demand Management focuses on regional means of reducing the number of vehicle trips and vehicle miles traveled, as well as increasing vehicle occupancy. It facilitates higher vehicle occupancy or reduces traffic
congestion by expanding the traveler's transportation options in terms of travel method, travel time, travel route, travel costs, and the quality and convenience of the travel experience.

Although Transportation System Management measures alone could not satisfy the purpose and need of the project, the following Transportation System Management measures have been incorporated into the build alternatives for this project: signage and lighting, pavement striping, bicycle and pedestrian improvements, and maintenance of the existing Park and Ride lot. In addition, bypass lanes have been incorporated into the Roundabout Alternative, and signal timing optimization and turning lanes have been incorporated into the Signalized Intersection Alternative.

### 1.4.4 No Build Alternative

The No Build Alternative consists of the future conditions with transportation improvements only as currently planned and programmed for funding. The No Build Alternative provides a basis for comparing the build alternatives. Under NEPA, the No Build Alternative can be used as the baseline for comparing environmental impacts; under CEQA, the baseline for environmental impact analysis consists of the existing conditions at the time the environmental studies began. The No Build Alternative would result in additional congestion and delay at the intersection by 2040. The wait time for traffic to cross the intersection worsens from approximately 5 minutes to approximately 10 minutes in the morning peak hour, and from approximately 6 minutes to approximately 12 minutes in the evening peak hour. Due to this additional congestion and delay, safety at the intersection would continue to worsen, and ingress and egress from adjacent properties would continue to be challenging. Additionally, pedestrian and bicycle facilities would not be constructed.

### 1.5 Comparison of Alternatives

The criteria developed to evaluate the build alternatives are the points outlined in the purpose statement. These criteria were developed in coordination with Caltrans, SCTA, and through the public participation process. They are based on what each of these entities hopes the project will achieve. The build alternatives and the No Build Alternative will be evaluated based on how well they accomplish the criteria outlined in the purpose statement.

The build alternatives share some common design features. For both, the existing eastbound free right turn off of SR 121/Arnold Drive would be removed, and the alternatives would provide pedestrian facilities, pedestrian-scale lighting, striped crosswalks, and bicycle lanes. Modification to landscape, drainage systems, and access control would be needed to accommodate the new configuration of the signalized intersection or roundabout, and ROW acquisition would be required. Utility relocations are anticipated for overhead and underground
utilities under each build alternative. Table 1-2 provides a summary comparison of the project alternative features.

<table>
<thead>
<tr>
<th>Project Features</th>
<th>Roundabout Alternative</th>
<th>Signalized Intersection Alternative</th>
<th>No Build Alternative</th>
<th>Additional Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic signal</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Not applicable (N/A)</td>
</tr>
<tr>
<td>Traffic roundabout</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Pedestrian facilities</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Pedestrian-scale lighting</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Striped crosswalks</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Pedestrian countdown signals</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Hawk signals (a traffic control device used to stop road traffic and allow pedestrians to cross safely) could be provided on multilane crossings at roundabout if necessary. This would be determined during the design phase of the project.</td>
</tr>
<tr>
<td>Bicycle lanes</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Bicyclists could utilize the Class II bicycle lanes or the Class I shared-use path under the Roundabout Alternative. Under the Signalized Intersection Alternative, bicyclists would travel through a bicycle-dedicated lane in the intersection.</td>
</tr>
<tr>
<td>Park and Ride relocation</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Under the Signalized Intersection Alternative, the lot would remain in the southeast quadrant but would be reconfigured.</td>
</tr>
<tr>
<td>Landscape changes</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Utility relocation</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Drainage system modification</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>ROW acquisition</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N/A</td>
</tr>
<tr>
<td>Business displacement</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
</tr>
</tbody>
</table>
After comparing and weighing the benefits and impacts of all feasible alternatives, some of which are summarized in Table 1-2, the Project Development Team circulated the Draft Environmental Document. After public circulation of the Draft Environmental Document, all comments were considered, and the Project Development Team selected a Preferred Alternative and made the final determination of the project’s effect on the environment. Under CEQA, because no significant adverse impacts that could not be mitigated were identified, Caltrans is preparing a Mitigated Negative Declaration. Similarly, Caltrans determined the action does not significantly impact the environment, and Caltrans, as assigned by the Federal Highway Administration, is issuing a Finding of No Significant Impact (FONSI) in accordance with NEPA.

1.6 Identification of a Preferred Alternative

Following circulation of the Draft Environmental Document, careful evaluation of all comments submitted by the public, and in consideration of the whole record, the Project Development Team selected the Roundabout Alternative as the Preferred Alternative because it more fully addresses the purpose and need of the project compared to the Signalized Intersection Alternative. The Preferred Alternative provides greater congestion reduction by providing shorter time delays and queues getting through the intersection; significantly reduces the number of conflict points between vehicles; and has the potential to reduce the number and severity of broadside collisions compared to the Signalized Intersection Alternative. It would also result in fewer environmental impacts to wetlands, less new impervious surfaces, removal of fewer native and non-native trees, and no loss of Park and Ride parking spaces. Additionally, the Roundabout Alternative would provide greater reductions in air pollutant emissions compared to the Signalized Intersection Alternative. Implementation of the Roundabout Alternative would not result in environmental impacts that could not be mitigated.

1.7 Alternatives Considered but Eliminated from Further Discussion

During an earlier phase of this project, other alternatives were considered and evaluated for feasibility. One alternative, Build Alternative 1A (Roundabout with S-Curve), was considered but eliminated from further discussion. Build Alternative 1A would have been the same as the Roundabout Alternative, except for the addition of a set of successive curves (S-curve). These S-curves would have been included on three of the four legs to reduce the approaching speed of vehicles heading towards the roundabout so that the approaching speed would match the circulatory speed of the roundabout. Build Alternative 1A would have required the acquisition of more ROW than the other build alternatives. In addition, subsequent studies found that the approaching speed of vehicles heading towards the roundabout would be slow enough without the S-curve. Therefore, to minimize environmental impacts, Build Alternative 1A was not carried forward for further analysis.
1.8 Permits and Approvals Needed

Table 1-3 summarizes the regulatory permits and approvals needed for project construction.

### Table 1-3: Regulatory Permits and Approvals

<table>
<thead>
<tr>
<th>Agency</th>
<th>Permit or Approval</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Fish and Wildlife Service</td>
<td>Biological Opinion documenting formal consultation for threatened and endangered</td>
<td>Threatened and Endangered Species Act Section 7 consultation was initiated following identification of the Preferred Alternative. The Biological Opinion was obtained on April 12, 2017, and is included in Appendix G.</td>
</tr>
<tr>
<td></td>
<td>species under Section 7 of the Federal Endangered Species Act.</td>
<td></td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers, San Francisco District</td>
<td>Concurrence of wetland/waters of the U.S. delineation. Section 404 Individual Permit</td>
<td>Caltrans consulted with the U.S. Army Corps of Engineers to obtain a Wetland/ Waters of the U.S. Preliminary Jurisdictional Determination was issued via e-mail on November 28, 2016. The Section 404 Individual Permit will be obtained during final design.</td>
</tr>
<tr>
<td></td>
<td>for dredge and/or fill in wetlands and other waters of the U.S.</td>
<td></td>
</tr>
<tr>
<td>Federal Highway Administration</td>
<td>Project-level conformity determination received February 14, 2017.</td>
<td>The Federal Highway Administration made a finding that the project is consistent with requirements of the Clean Air Act on February 14, 2017, and this is included in Appendix G.</td>
</tr>
<tr>
<td>State Water Resources Control Board</td>
<td>Construction General Permit for stormwater discharges – Caltrans; Section 402 Caltrans National Pollutant Discharge Elimination System Permit for greater than 1 acre.</td>
<td>Obtain coverage under the General Permit by preparation and submittal of a Notice of Intent before start of construction.</td>
</tr>
<tr>
<td>San Francisco Bay Regional Water Quality Control Board</td>
<td>Section 401 Water Quality Certification.</td>
<td>Obtain the 401 Water Quality Certification during the final design phase.</td>
</tr>
</tbody>
</table>
### Table 1-3: Regulatory Permits and Approvals

<table>
<thead>
<tr>
<th>Agency</th>
<th>Permit or Approval</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Historic Preservation Officer</td>
<td>Concurrence with the project’s Historic Property Survey Report and Section 106 requirement.</td>
<td>Caltrans sent a letter to the State Historic Preservation Officer on February 11, 2016, for concurrence on the National Register of Historic Places eligibility determination for one historic property. Concurrence for eligibility determination from the State Historic Preservation Officer was received on March 21, 2016. On August 21, 2015, Caltrans Office of Environmental Analysis approved a request from District 4, Cultural Resources staff to use a phased approach for identification of archaeological resources. On August 23, 2016, Caltrans submitted Section 106 documentation for concurrence on the Finding of Effect to the State Historic Preservation Officer. Concurrence on the project’s finding of No Adverse Effect was issued to District 4 by the Office of Historic Preservation on September 29, 2016.</td>
</tr>
<tr>
<td>Sonoma County Permit and Resource Management Department/Sonoma County Department of Health Services</td>
<td>Drilling Permit for geotechnical investigations. Notification regarding presence of hazardous materials.</td>
<td>Obtain during the final design phase. Obtain during the final design phase after a Preliminary Site Investigation is prepared.</td>
</tr>
</tbody>
</table>
Chapter 2  Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

This chapter explains the impacts that the project would have on the environment. It describes the regulatory setting, existing environment that could be affected by the project, potential impacts (environmental consequences), and proposed avoidance, minimization, and/or mitigation measures. Potential impacts are broken up into project-level impacts, which occur permanently during project operation, and construction impacts, which are temporary impacts during construction. The environmental resource discussions presented in this chapter are based on the technical studies cited at the beginning of each discussion and listed at the end of this document. An evaluation of the proposed project per the CEQA checklist criteria is provided in Appendix A. Avoidance, minimization, and/or mitigation measures for each of the environmental resource areas are discussed in the following sections.

As part of the scoping and environmental analysis carried out for the project, the following environmental issues were considered, but no adverse impacts were identified. As a result, there is no further discussion about these issues in this document.

- **Coastal zone:** The study area is not within a coastal zone, as determined by the Local Coastal Plan of Sonoma County; therefore, no impact to this resource is anticipated (County of Sonoma, 2001). In addition, the study area is not within San Francisco Bay Conservation and Development Commission jurisdiction.

- **Wild and scenic rivers:** There are no wild and scenic rivers within the study area, as defined by the National Wild and Scenic Rivers System. The closest wild and scenic river is the American (lower) River in Sacramento; therefore, no impact to this resource is anticipated (National Wild and Scenic Rivers System).

- **Parks and recreational facilities:** There are no parks, recreational facilities, or Section 4(f) resources of this type within or near the study area. The closest parks and recreational facilities are 7 miles to the west in Petaluma and 3 miles to the north in Sonoma; therefore, no impacts are anticipated.

- **Growth:** The first-cut screening was conducted in accordance with the Caltrans Standard Environmental Reference (2015) Guidance for Preparers of Growth-Related, Indirect Impact Analyses to determine whether there would be growth impacts due to implementation of the build alternatives. The purpose of the project is to improve operations for vehicles, bicycles, and pedestrians, consequently reducing congestion and the occurrence of accidents. Additionally, where possible, the project would maintain and
enhance access to adjacent properties and parking for public transit and carpool users. These improvements could change the accessibility of the area by making this intersection a more attractive travel option (e.g., aesthetics, reduced congestion), which could encourage some businesses or households to locate in the study area instead of other places in the region. The project type (intersection improvements) could also create new and/or improved access to nearby roadways and businesses in the area. However, after considering other factors such as project location (rural) and a lack of growth pressure (restrictive land use controls), it can be determined that project-related growth is not reasonably foreseeable and further growth analysis is not warranted; therefore, no growth-related impacts are anticipated.

- **Timberlands:** There are no timberlands within the study area; therefore, no impacts to these resources are anticipated.

- **Community character and cohesion:** Impacts on community character and cohesion are not anticipated. The project would not affect community character or cohesion. While the overall footprint of the intersection would increase under any build alternative, the project would not divide neighborhoods, separate residences from community facilities, change the quality of life, or increase urbanization or isolation.

- **Environmental justice:** The project would not cause disproportionately high and adverse effects on any minority or low-income populations as per Executive Order 12808 regarding environmental justice. Environmental justice impacts would occur only if the population in any Census Tract Block Group met or exceeded either of the following criteria, as suggested by the Council on Environmental Quality: (1) The Census Tract Block Group contained 50 percent or more minority or low-income population; or (2) The percentage of minority or low-income population in any Census Tract Block Group was more than 10 percentage points greater than the average in the city and/or county in which the Census Tract Block Group is located. The project area is located within Census Tract 1501. The total population of this census tract is 2,854; 81 percent of the population is white, and 6.9 percent is below the poverty threshold. These percentages indicate that there is not a significant minority or low-income population within the study area; therefore, implementation of the build alternatives would not cause disproportionately high and adverse effects on any minority or low-income populations.

- **National Marine Fisheries Service:** The project is located outside of National Marine Fisheries Service jurisdiction; therefore, a National Marine Fisheries Service species list is not required, and no effects to National Marine Fisheries Service species are anticipated.
2.1 Human Environment

2.1.1 Existing and Future Land Use

2.1.1.1 Affected Environment

This section summarizes the *Land Use and Community Impacts Memorandum* (June 2017). The primary land use in the study area is agriculture, with some commercial and rural residential land uses located at the corners of the SR 116/121 intersection. Commercial land uses include a gas station, deli, hotel, and retail shops. Figure 2.1-1 shows the land uses, as designated by the Sonoma County General Plan, within the study area. A site survey was conducted on March 16, 2015, and confirmed that, within the study area, the existing land uses match the land uses shown in Figure 2.1-1.

![Figure 2.1-1: Existing Land Use](image)

The Sonoma County General Plan divides Sonoma County into nine subcounty planning areas to better develop and implement goals, policies, and programs specific to each planning area. The study area is located in the Sonoma Valley planning area, defined as the area that extends from Bennett Valley and Kenwood south to San Pablo Bay and from the crest of the Sonoma Mountains east to the Sonoma-Napa county line. SR 116 and SR 121 are important traffic...
arteries in this planning area, and agriculture, particularly vineyard cultivation, wine processing, and tourism, are mainstays of the local economy. Some manufacturing and service businesses also exist. Much of the local employment is in the "retail trade" and "services" sectors. Many workers commute to jobs outside the Valley, and the SR 116/121 intersection is one of the primary routes into and out of the City of Sonoma (Sonoma County, 2008).

In 2010, the population in the Sonoma Valley planning area was 35,505 (U.S. Census Bureau, 2010). By 2020, the population in the planning area is expected to reach 48,990 people. Of this population, 34,400 is expected within the unincorporated area, particularly in the Urban Service Area along Highway 12, with the remaining 14,590 people within the City of Sonoma. Local job growth is projected primarily in the "services" and "retail" sectors (Sonoma County, 2008). Despite this projected growth in the region, the study area is unlikely to absorb much of it, due to building restrictions and agricultural preservation goals.

There are a few projects currently in various phases of planning in the project vicinity. These projects, which are listed in Table 2.1-1, are located within 1 mile of the SR 116/121 intersection in Sonoma County, near the City of Sonoma.

### Table 2.1-1: Major Development Projects within the Study Area

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Jurisdiction</th>
<th>Proposed Uses</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art Fichtenburg's Tasting Room (128-461-014)</td>
<td>Development</td>
<td>Sonoma County</td>
<td>The project would convert an existing retail building into a tasting room on a 5.09-acre parcel. It is CEQA exempt.</td>
<td>On hold since 2011</td>
</tr>
<tr>
<td>Vineyard Inn Hotel (142-101-006)</td>
<td>Development</td>
<td>Sonoma County</td>
<td>Requested a permit to locate retail space in their existing building.</td>
<td>Permit pending</td>
</tr>
<tr>
<td>Anaba Winery (142-101-023)</td>
<td>Development</td>
<td>Sonoma County</td>
<td>Requested a permit to allow a tasting room to remain onsite.</td>
<td>Permit approved</td>
</tr>
<tr>
<td>Wagner Road Vineyards (128-461-084)</td>
<td>Development</td>
<td>Sonoma County</td>
<td>The project would include construction of a new approximately 4,000-square-foot building to house a winery with barrel storage and agricultural promotional events.</td>
<td>Mitigated Negative Declaration prepared</td>
</tr>
</tbody>
</table>
Table 2.1-1: Major Development Projects within the Study Area

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Jurisdiction</th>
<th>Proposed Uses</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schug Winery (128-451-054)</td>
<td>Development</td>
<td>Sonoma County</td>
<td>The project would increase production at an existing winery from 10,000 cases per year to 30,000 cases per year and add a 6,300-square-foot tasting/hospitality building.</td>
<td>Mitigated Negative Declaration is being prepared</td>
</tr>
</tbody>
</table>

Source: Land Use and Community Impacts Memorandum 2017; SCTA, March 2017; Sonoma County Permit and Resource Management Department, 2015.

2.1.1.2 Environmental Consequences

Project-Level Impacts

Build Alternatives

The impacts of both build alternatives would be very similar to one another. The build alternatives would require the acquisition of property in order to be implemented, which is discussed further in Section 2.1.4, Property Acquisitions. Land use conversion totals are shown in Table 2.1-2. The Roundabout Alternative would convert 3.78 acres of land to transportation use, including 0.09 acre of diverse agriculture and 3.69 acres of land-intensive agriculture. The Signalized Intersection Alternative would convert 4.14 acres of land to transportation use, including 0.15 acre of diverse agriculture, 3.73 acres of land-intensive agriculture, 0.02 acre of limited commercial land uses, and 0.24 acre of recreation/visitor-serving commercial land uses. Overall, this conversion of land would be minor compared to the total amount of the land in the study area (70.20 acres) and the total amount of land in Sonoma County.

Table 2.1-2: Permanent and Temporary Conversion of Land Use

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Roundabout Alternative</th>
<th>Signalized Intersection Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Permanent (acres)</td>
<td>Temporary (acres)</td>
</tr>
<tr>
<td>Diverse agriculture</td>
<td>0.09</td>
<td>0.05</td>
</tr>
<tr>
<td>Land-intensive agriculture</td>
<td>3.69</td>
<td>0.22</td>
</tr>
<tr>
<td>Limited commercial</td>
<td>0.00</td>
<td>0.11</td>
</tr>
<tr>
<td>Recreation/visitor-serving commercial</td>
<td>0.00</td>
<td>0.06</td>
</tr>
<tr>
<td>Total</td>
<td>3.78</td>
<td>0.44</td>
</tr>
</tbody>
</table>

**No Build Alternative**

The No Build Alternative would not convert any existing land uses to transportation uses, nor would it have direct effects on land uses in the project area. Furthermore, the location, characteristics, and uses of existing transportation facilities generally would not change.

**Construction Impacts**

**Build Alternatives**

The impacts of both build alternatives would be very similar to one another. The build alternatives would require the temporary acquisition of property to have sufficient space to physically construct the project features, and for other construction activities such as access, construction of fences, and to conform the project features to the existing topography. Temporary conversion of land use totals are shown above in Table 2.1-2. The Roundabout Alternative would temporarily acquire 0.44 acre of land, including 0.05 acre of diverse agriculture, 0.22 acre of land-intensive agriculture, 0.11 acre of limited commercial land uses, and 0.06 acre of recreation/visitor-serving commercial land uses. The Signalized Intersection Alternative would temporarily acquire 0.46 acre of land, including 0.03 acre of diverse agriculture, 0.30 acre of land-intensive agriculture, 0.07 acre of limited commercial land uses, and 0.06 acre of recreation/visitor-serving commercial land uses. Overall, this temporary conversion of land would be minor compared to the total amount of the land in the study area (70.20 acres) and the total amount of land in Sonoma County.

**No Build Alternative**

The No Build Alternative would not temporarily acquire any existing property, nor would it affect land uses in the project area. Furthermore, the location, characteristics, and uses of existing transportation facilities generally would not change. As traffic volumes increase in the future, delay and congestion at the intersection would continue to worsen without any operational improvements.

2.1.1.3 **Project Features, Avoidance, Minimization, and/or Mitigation Measures**

The project alignment for both build alternatives has been adjusted to fit within existing ROW where feasible to minimize conversion of land use. In addition, the measures identified in Section 2.1.4.4, Property Acquisitions, Project Features, Avoidance, Minimization, and/or Mitigation Measures, also apply. No additional avoidance, minimization, and/or mitigation measures are required.

2.1.2 **Consistency with State, Regional, and Local Plans**

2.1.2.1 **Affected Environment**

This section summarizes the *Land Use and Community Impacts Memorandum* (June 2017) and identifies existing State, regional, local, and area plans and policies that apply to areas along
SR 116 and SR 121. The proposed project is located in unincorporated Sonoma County. Planning goals and policies relevant to the proposed project are described below in Table 2.1-3.

**Sonoma County General Plan**
The Sonoma County General Plan 2020, adopted in 2008, expresses policies that will guide decisions on future growth, development, and conservation of resources through 2020 in a manner consistent with the goals and quality of life desired by the county’s residents. The land use (LU), circulation (CT), and open space (OSRC) goals, objectives, and/or policies that relate to the proposed project are discussed in Table 2.1-3.

**Metropolitan Transportation Commission Plan Bay Area**
Metropolitan Transportation Commission’s Plan Bay Area 2040, adopted in 2013, is a long-range integrated transportation and land-use/housing strategy through 2040 for the San Francisco Bay Area. Plan Bay Area 2040 marks the nine-county region’s first long-range plan to meet the requirements of California’s landmark 2008 Senate Bill 375, which calls on each of the State’s 18 metropolitan areas to develop a Sustainable Communities Strategy to accommodate future population growth and reduce greenhouse gas emissions from cars and light trucks. The investment strategy that relates to the proposed project is discussed in Table 2.1-3.

**SCTA 2009 Comprehensive Transportation Plan**
SCTA’s 2009 Comprehensive Transportation Plan, adopted in 2009, is the latest countywide planning document approved by SCTA. The purpose of the Plan is primarily to update past transportation planning efforts to prioritize transportation needs throughout Sonoma County for the next 25 years. The policies that relate to the proposed project are discussed in Table 2.1-3.

**2014 Countywide Bicycle and Pedestrian Master Plan**
SCTA’s 2014 update to the Countywide Bicycle and Pedestrian Master Plan seeks to facilitate transportation improvements for bicyclists and pedestrians. The goals and objectives that relate to the proposed project are discussed in Table 2.1-3.

### 2.1.2.2 Environmental Consequences

**Project-Level Impacts**

**Build Alternatives**
The impacts of both build alternatives would be very similar to one another. Planning goals and policies identified in State, regional, and local plans related to the proposed project are described below in Table 2.1-3.
Table 2.1-3: Consistency with State, Regional, and Local Plans and Programs

<table>
<thead>
<tr>
<th>Goals/Policies</th>
<th>Roundabout Alternative (Preferred Alternative)</th>
<th>Signalized Intersection Alternative</th>
<th>No Build Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sonoma County General Plan</strong></td>
<td>Not Consistent.</td>
<td>Not Consistent.</td>
<td>Consistent.</td>
</tr>
<tr>
<td><strong>GOAL LU-9:</strong> Protect lands currently in agricultural production and lands with soils and other characteristics that make them potentially suitable for agricultural use. Retain large parcel sizes and avoid incompatible nonagricultural uses.</td>
<td>The Roundabout Alternative would require permanent conversion of 1.47 acres of Important Farmland. However, this property acquisition would be at the edges of large agricultural parcels; therefore, large parcel sizes would be maintained.</td>
<td>The Signalized Intersection Alternative would require permanent conversion of 1.57 acres of Important Farmland. However, this property acquisition would be at the edges of large agricultural parcels; therefore, large parcel sizes would be maintained.</td>
<td>The No Build Alternative would not affect agricultural lands or parcel sizes within the study area.</td>
</tr>
<tr>
<td><strong>Objective CT-3.8:</strong> Increase the safety, convenience, and comfort of all pedestrians and bicyclists by eliminating the potential obstacles to this mode choice that is associated with the lack of continuous and well-connected pedestrian walkways and bicycle facilities, and the lack of safe crossing facilities, especially focusing on short trips that could result in a decrease in automobile travel.</td>
<td>Consistent. The Roundabout Alternative would provide 10-foot-wide Class I shared-use paths surrounding the roundabout. Each crossing would include a striped crosswalk, pedestrian-scale lighting, and signage to alert motorists to the presence of pedestrians and bicyclists. Bicyclists would use the highway shoulder in approaching and exiting the roundabout, with the shoulder serving as a Class II bicycle lane. In lieu of merging with the circulating traffic, the bicyclists would have the option to leave the mixed-flow lane via bicycle ramps and instead use the 10-foot-wide Class I shared-use path.</td>
<td>Consistent. The Signalized Intersection Alternative would provide 6-foot-wide pedestrian sidewalks between the four intersection legs. On the SR 116/Arnold Drive, SR 121/Arnold Drive, and SR 121/Fremont Drive intersection legs, bicycle lanes would be Class II compliant. Bicyclists would use the highway shoulders on the intersection approach, and through the intersection bicyclists would have their own dedicated bicycle lane.</td>
<td>Not Consistent. Under the No Build Alternative, sidewalks and bicycle lanes would not be constructed. Pedestrian and bicycle conditions would remain inconvenient.</td>
</tr>
</tbody>
</table>
## Table 2.1-3: Consistency with State, Regional, and Local Plans and Programs

<table>
<thead>
<tr>
<th>Goals/Policy</th>
<th>Roundabout Alternative (Preferred Alternative)</th>
<th>Signalized Intersection Alternative</th>
<th>No Build Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy CT-7uu:</strong> Work with Caltrans in considering intersection improvements at Highways 116 and 121 and passing lanes, and access management along Highway 121 to reduce congestion, provided that the improvements are consistent with the designated road classifications.</td>
<td><strong>Consistent.</strong> The Roundabout Alternative considers SR 116/121 intersection improvements in the form of a roundabout, which, if implemented, would reduce congestion and delay. Improvements would be consistent with the designated road classifications.</td>
<td><strong>Consistent.</strong> The Signalized Intersection Alternative considers SR 116/121 intersection improvements in the form of a signalized intersection, which, if implemented, would reduce congestion and delay.</td>
<td><strong>Not Consistent.</strong> The No Build Alternative would not implement intersection improvements at the SR 116/121 intersection. Congestion and delay would continue to worsen.</td>
</tr>
<tr>
<td><strong>GOAL OSRC-7:</strong> Protect and enhance the County’s natural habitats and diverse plant and animal communities.</td>
<td><strong>Consistent.</strong> The Roundabout Alternative would impact natural habitats and plant and animal communities; however, avoidance, minimization, and/or mitigation measures will be implemented to restore any lost natural habitat and to avoid and minimize impacts to natural habitats and diverse plant and animal communities. This is further described in Section 2.3.</td>
<td><strong>Consistent.</strong> The Signalized Intersection Alternative would impact natural habitats and plant and animal communities; however, avoidance, minimization, and/or mitigation measures will be implemented to restore any lost natural habitat and to avoid and minimize impacts to natural habitats and diverse plant and animal communities. This is further described in Section 2.3.</td>
<td><strong>Consistent.</strong> Under the No Build Alternative, natural habitats and diverse plant and animal communities would not be affected.</td>
</tr>
</tbody>
</table>
Table 2.1-3: Consistency with State, Regional, and Local Plans and Programs

<table>
<thead>
<tr>
<th>Goals/Policy</th>
<th>Roundabout Alternative (Preferred Alternative)</th>
<th>Signalized Intersection Alternative</th>
<th>No Build Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metropolitan Transportation Commission Plan Bay Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Investment Strategy 4:</strong> Boost freeway and transit efficiency.</td>
<td>Consistent. The Roundabout Alternative would improve efficiency at the SR 116/121 intersection by reducing congestion and delay.</td>
<td>Consistent. The Signalized Intersection Alternative would improve efficiency at the SR 116/121 intersection by reducing congestion and delay.</td>
<td>Not Consistent. Under the No Build Alternative, the SR 116/121 intersection would not undergo any improvements. Delay would continue to worsen, as would the efficiency of the intersection.</td>
</tr>
</tbody>
</table>

| **SCTA 2009 Comprehensive Transportation Plan** | | | |
| **Policy 2c:** Implement new technologies to monitor and control traffic flow. | Consistent. The Roundabout Alternative would implement new technologies (i.e., traffic circle) to better control traffic flow, which in turn would reduce congestion and delay. | Consistent. The Signalized Intersection Alternative would implement new technologies (signalized improvements) to better control traffic flow, which in turn would reduce congestion and delay. | Not Consistent. Under the No Build Alternative, new technologies to control traffic flow would not be implemented. Congestion at the SR 116/121 intersection would continue to worsen. |

| **Policy 3c:** Improve accessibility and safety for pedestrians at and around activity centers. | Consistent. The Roundabout Alternative would provide 10-foot-wide Class I shared-use paths surrounding the roundabout. Each crossing would include a striped crosswalk, pedestrian-scale lighting, and signage to alert motorists to the presence of pedestrians. | Consistent. The Signalized Intersection Alternative would provide 6-foot-wide pedestrian sidewalks between the four intersection legs. | Not Consistent. Under the No Build Alternative, sidewalks would not be constructed. Pedestrian conditions would remain inaccessible and inconvenient due to the lack of sidewalks and crosswalks, thereby increasing potential for conflicts between vehicles and pedestrians. |

| **2014 Countywide Bicycle and Pedestrian Master Plan** | | | |
| **Principal Goal:** To develop and maintain a comprehensive | Consistent. The Roundabout Alternative would | Consistent. The Signalized Intersection Alternative would | Not Consistent. Under the No Build Alternative, |
As shown in Table 2.1-3, the build alternatives for the SR 116/121 Intersection Improvements Project are mostly consistent with planning goals and policies in local and regional plans and studies. The only policy with which the build alternatives would be inconsistent relates to the protection of agricultural land, which is discussed further in Section 2.1.3, Farmlands. Therefore, overall the build alternatives would be mostly consistent with the stated objectives of these jurisdictions.

**No Build Alternative**

The No Build Alternative would not support achievement of the goals described above in Table 2.1-3 because congestion and delay would continue to worsen and pedestrian and bicycle facilities would not be constructed.
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

Build Alternatives
Construction impacts of the build alternatives related to policy consistencies would be the same as described above under project-level impacts. The build alternatives would be mostly consistent with the stated objectives of these jurisdictions.

No Build Alternative
No construction impacts on consistency with State, regional, and local plans and programs would occur under the No Build Alternative.

2.1.2.3 Project Features, Avoidance, Minimization, and/or Mitigation Measures
The project alignment for both build alternatives has been adjusted to fit within existing ROW where feasible, which helps to ensure consistency with State, regional, and local plans by minimizing land use conversion. No other project features, avoidance, minimization, or mitigation measures are required.

2.1.3 Farmlands

2.1.3.1 Regulatory Setting
NEPA and the Farmland Protection Policy Act (7 U.S.C. 4201-4209; and its regulations, 7 CFR Part 658) require federal agencies, such as the Federal Highway Administration, to coordinate with the Natural Resources Conservation Service if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the Farmland Protection Policy Act, farmland includes Prime Farmland, Unique Farmland, and Land of Statewide or Local Importance.

CEQA requires the review of projects that would convert Williamson Act contract land to nonagricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to discourage the early conversion of agricultural and open space lands to other uses.

2.1.3.2 Affected Environment
This section summarizes the Land Use and Community Impacts Memorandum (June 2017). As of 2012, Sonoma County had 29,882 acres of land designated as Prime Farmland, 17,213 acres designated as Farmland of Statewide Importance, 33,079 acres designated as Unique Farmland, and 80,741 acres designated as Farmland of Local Importance (California Department of Conservation, 2015). The total amount of agricultural land in production was 578,006 acres. The Sonoma County General Plan identifies goals, policies, and objectives related to preserving existing agricultural land, as described in Section 2.1.2.1. The reported
The total value of agricultural production in Sonoma County for 2014 was $899,015,400, which is a 6 percent increase from the 2013 value. Fruit and nut crops represent 67 percent of the total production value, followed by livestock and poultry products at 18 percent. While the total value of agricultural production has been increasing, the total amount of agricultural land in production has been roughly the same due to both development and conservation activities.

The study area, shown in Figure 2.1-2, contains 22.7 acres of Important Farmland, including 1.16 acres of Prime Farmland, 5.7 acres of Farmland of Statewide Importance, and 15.9 acres of Farmland of Local Importance. There are no lands mapped as Unique Farmland or under a Williamson Act Contract within the study area (California Department of Conservation, 2015). Farmland designations for parcels within the study area are shown in Figure 2.1-2.

![Figure 2.1-2: Farmland within the Study area](image)

Prime Farmland is farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Farmland of Statewide Importance is farmland similar to Prime Farmland but with minor shortcomings, such as
greater slopes or less ability to store soil moisture. Unique Farmland is land other than Prime Farmland that has a special combination of unique characteristics needed to economically produce sustained high yields of a specific crop. Farmland of Local Importance is land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. Farmland of Local Importance is either currently producing, or has the capability of production, but does not meet the criteria of Prime Farmland, Farmland of Statewide Importance, or Unique Farmland.

Within the study area, vineyard cultivation is the primary agricultural use. Approximately 75 percent of the land within the study area, while classified as Important Farmland, is not currently in agricultural use.

### 2.1.3.3 Environmental Consequences

As a result of roadway geometry and ROW design refinement made between circulation of the Draft Environmental Document and preparation of the Final Environmental Document, impacts to farmland have changed, as discussed in the analysis below.

**Project-Level Impacts**

**Build Alternatives**

The impacts of both build alternatives would be very similar to one another. Neither build alternative would impact Williamson Act Contracts, Prime Farmland, Farmland of Statewide Importance, or Unique Farmland. The Roundabout Alternative would result in the direct conversion of 1.47 acres of Farmland of Local Importance, while the Signalized Intersection Alternative would result in the direct conversion of 1.57 acres of Farmland of Local Importance, as shown in Table 2.1-4 and Figures 2.1-3 and 2.1-4. As shown in Table 2.1-4, the amount of Important Farmland impacted by each alternative is a very small percentage of the total percent of farmland in Sonoma County and the State of California.

<table>
<thead>
<tr>
<th>Build Alternative</th>
<th>Land Converted (acres)</th>
<th>Farmland of Local Importance (acres)</th>
<th>Percent of Farmland in County</th>
<th>Farmland Conversion Impact Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Perm</td>
<td>Temp</td>
<td>Perm</td>
<td>Temp</td>
</tr>
<tr>
<td>Roundabout Alternative</td>
<td>3.78</td>
<td>0.44</td>
<td>1.47</td>
<td>0.22</td>
</tr>
<tr>
<td>Signalized Intersection</td>
<td>4.14</td>
<td>0.46</td>
<td>1.57</td>
<td>0.30</td>
</tr>
</tbody>
</table>

*Perm=Permanent Impact; Temp=Temporary impact
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Figure 2.1-3: Affected Farmland – Roundabout Alternative

Figure 2.1-4: Affected Farmland – Signalized Intersection Alternative
Impacts to mapped farmland were evaluated using the U.S. Department of Agriculture “Farmland Conversion Impact Rating” (Form AD 1006), which was completed in conjunction with the Natural Resource Conservation Service. Form AD 1006 helps determine the impact the project may have on farmlands within the project area. Specific criteria are looked at by both the Natural Resource Conservation Service and the federal agency involved, including, but not limited to, soil productivity, water conditions, proximity to other urban and rural land uses, impacts on remaining farmland after the conversion, and indirect or secondary effects of the project on agricultural and other local factors. The Natural Resource Conservation Service must complete the land evaluation part of the form, and the federal agency must complete the site assessment portion. Each criterion has a set number of points it may be awarded. Once those points are added up, they are compared to the “threshold score” of 160 points created by the U.S. Department of Agriculture. Sites receiving a total score of less than 160 need not be given further consideration for protection, and no additional sites need to be evaluated under the Farmland Protection Policy Act (CFR 658.4 (c) (2)). The Natural Resource Conservation Service reviewed and completed Parts II, IV, and V of the form on January 4, 2017. The completed form may be found in Appendix G. The total site assessment rating for the project is 133, which is below the threshold score of 160.

Based on the score of 133, further protection from farmland conversion is not warranted under either build alternative. In addition, the size of the conversion represents a very small fraction (less than 0.01 percent) of the mapped farmland in the county and a relatively small percentage of the overall size of the impacted parcels. Compensation to individual landowners for property impacts would be addressed and negotiated through the ROW process, as warranted.

No Build Alternative

The No Build Alternative would not impact farmlands.

Construction Impacts

Build Alternatives

The Roundabout Alternative would result in temporary conversion of 0.22 acre of Farmland of Local Importance, while the Signalized Intersection Alternative would result in temporary conversion of 0.30 acre of Important Farmland, as shown in Table 2.1-4 and Figures 2.1-3 and 2.1-4.

No Build Alternative

The No Build Alternative would not impact farmlands.
2.1.3.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures

Because adverse impacts to farmlands from the build alternatives would be extremely minor, no mitigation is proposed. Measure PF COM-1 (discussed below in Section 2.1.4.4) will be implemented to minimize impacts to farmland conversion.

2.1.4 Relocations and Real Property Acquisition

2.1.4.1 Regulatory Setting

Caltrans’ Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 CFR Part 24. The purpose of the Relocation Assistance Program is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 U.S.C. 2000d, et seq.). Please see Appendix C for a copy of the Caltrans Title VI Policy Statement.

2.1.4.2 Affected Environment

This section summarizes the Land Use and Community Impacts Memorandum (June 2017). The project would require permanent acquisitions and temporary construction easements of some parcels adjacent to the project. Parcels potentially affected under the Roundabout Alternative or Signalized Intersection Alternative are listed below:

- 128-451-014
- 128-451-047
- 128-461-012
- 128-461-014
- 128-461-015
- 128-461-044
- 128-461-048
- 128-461-083
- 142-081-015
- 142-101-023

2.1.4.3 Environmental Consequences

As a result of roadway geometry and ROW design refinement made between circulation of the Draft Environmental Document and preparation of the Final Environmental Document,
impacts to relocations and real property acquisitions have changed, as discussed in the analysis below.

**Project-Level Impacts**

**Build Alternatives**

The impacts of both build alternatives would be very similar to one another. Neither build alternative requires relocation of any households or businesses, nor do they require the acquisition of entire properties. Both build alternatives would require partial acquisitions along property frontages on SR 116 and SR 121. Permanent partial property acquisitions and temporary construction easements are shown in Figures 2.1-5 and 2.1-6 and identified in Tables 2.1-5 and 2.1-6. Temporary construction easements are further discussed in the next section.

The build alternatives would not affect any residential properties. Partial acquisitions of commercial properties would be required under the Signalized Intersection Alternative. This would entail permanently acquiring small portions along property frontages from APN 128-461-015 (Vineyard Inn) and APN 128-451-047 (76 Gas Station, Carneros Deli, and Bonneau’s Tire Auto Services Center). These acquisitions would not affect business operations because they do not include the acquisition of any structures or buildings necessary for business operation.

Two parcels classified as agricultural land (APN 142-081-015 and APN 142-101-023) would also be affected by the project. One, Anaba Wines, is a vineyard. A very small amount of land would be acquired along the property frontage under both alternatives. The build alternatives would require widening Bonneau Road to accommodate tapers and intersection improvements. The widening would not impact the Anaba winery operations, but it would require relocation of fences, signs, and landscaping. Anaba Wines recently constructed leach mounds, which were installed as part of a mitigation requirement for water treatment of their bottling and processing facility expansion. The build alternatives maintain a minimum clearance of 20 feet from the leach mounds to not impact operations. The final analysis for any modification to the Anaba Wines property will be evaluated during the design phase.

The second agricultural parcel affected is a large undeveloped parcel in the northeast quadrant of the study area. Under the Roundabout Alternative, this parcel would be needed for the relocated Park and Ride lot. Under the Signalized Intersection Alternative, this parcel would be needed for the additional turn lanes and a bus stop.
Figure 2.1-5: Preliminary Property Acquisitions – Roundabout Alternative
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Figure 2.1-6: Preliminary Property Acquisitions – Signalized Intersection Alternative
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Table 2.1-5: Preliminary Permanent Partial Property Acquisitions by Alternative

<table>
<thead>
<tr>
<th>APN</th>
<th>Type of Property</th>
<th>Total (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roundabout Alternative</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>142-081-015</td>
<td>Land Intensive Agriculture</td>
<td>3.69</td>
</tr>
<tr>
<td>142-101-023</td>
<td>Diverse Agriculture</td>
<td>0.09</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>3.78</strong></td>
</tr>
<tr>
<td><strong>Signalized Intersection Alternative</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>128-461-015</td>
<td>Recreation/Visitor-Serving Commercial</td>
<td>0.24</td>
</tr>
<tr>
<td>128-451-047</td>
<td>Limited Commercial</td>
<td>0.02</td>
</tr>
<tr>
<td>142-081-015</td>
<td>Land Intensive Agriculture</td>
<td>3.73</td>
</tr>
<tr>
<td>142-101-023</td>
<td>Diverse Agriculture</td>
<td>0.15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>4.14</strong></td>
</tr>
</tbody>
</table>

Note: Document protocol is to use numerical precision to two decimal places; however, in some instances numerical precision is expanded to three decimal places to accurately reflect the proposed property impact.

Table 2.1-6: Temporary Construction Easements by Alternative

<table>
<thead>
<tr>
<th>APN</th>
<th>Type of Property</th>
<th>Total (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roundabout Alternative</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>128-451-047</td>
<td>Limited Commercial</td>
<td>0.08</td>
</tr>
<tr>
<td>128-461-012</td>
<td>Limited Commercial</td>
<td>0.009</td>
</tr>
<tr>
<td>128-461-015</td>
<td>Recreation/Visitor-Serving Commercial</td>
<td>0.06</td>
</tr>
<tr>
<td>128-461-048</td>
<td>Limited Commercial</td>
<td>0.002</td>
</tr>
<tr>
<td>128-461-083</td>
<td>Limited Commercial</td>
<td>0.005</td>
</tr>
<tr>
<td>128-461-044</td>
<td>Limited Commercial</td>
<td>0.003</td>
</tr>
<tr>
<td>128-451-014</td>
<td>Limited Commercial</td>
<td>0.01</td>
</tr>
<tr>
<td>142-081-015</td>
<td>Land-Intensive Agriculture</td>
<td>0.22</td>
</tr>
<tr>
<td>142-101-023</td>
<td>Diverse Agriculture</td>
<td>0.05</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>0.44</strong></td>
</tr>
</tbody>
</table>

Note: Document protocol is to use numerical precision to two decimal places; however, in some instances numerical precision is expanded to three decimal places to accurately reflect the proposed property impact.
Table 2.1-6: Temporary Construction Easements by Alternative

<table>
<thead>
<tr>
<th>APN</th>
<th>Type of Property</th>
<th>Total (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>128-461-015</td>
<td>Recreation/Visitor-Serving Commercial</td>
<td>0.06</td>
</tr>
<tr>
<td>128-451-047</td>
<td>Limited Commercial</td>
<td>0.04</td>
</tr>
<tr>
<td>142-101-023</td>
<td>Diverse Agriculture</td>
<td>0.03</td>
</tr>
<tr>
<td>128-461-012</td>
<td>Limited Commercial</td>
<td>0.009</td>
</tr>
<tr>
<td>128-461-014</td>
<td>Limited Commercial</td>
<td>0.01</td>
</tr>
<tr>
<td>128-461-044</td>
<td>Limited Commercial</td>
<td>0.003</td>
</tr>
<tr>
<td>128-461-083</td>
<td>Limited Commercial</td>
<td>0.005</td>
</tr>
<tr>
<td>128-461-048</td>
<td>Limited Commercial</td>
<td>0.002</td>
</tr>
<tr>
<td>128-081-015</td>
<td>Land-Intensive Agriculture</td>
<td>0.30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>0.46</strong></td>
</tr>
</tbody>
</table>

Note: Document protocol is to use numerical precision to two decimal places; however, in some instances numerical precision is expanded to three decimal places to accurately reflect the proposed property impact.

**No Build Alternative**

No residential or nonresidential uses would be subject to property acquisition or relocations for the No Build Alternative.

**Construction Impacts**

**Build Alternatives**

The impacts of both build alternatives would be very similar to one another. Temporary construction easements would be required under both build alternatives from some parcels to construct the project. These temporary acquisitions are identified in Table 2.1-6 and shown in Figures 2.1-5 and 2.1-6. All temporary construction easements would be from property frontages; no buildings or structures would be acquired.

**No Build Alternative**

No residential or nonresidential uses would be subject to property acquisition or relocations for the No Build Alternative.

**2.1.4.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures**

Property acquisition will be conducted in compliance with Title VI of the Civil Rights Act (42 U.S.C. 2000d, et seq.), the Federal Uniform Relocation Assistance and Real Property
Acquisition Policies Act of 1970 (as amended), and Title 49 CFR Part 24. Compensation for property to be acquired would be based on fair market value and would be part of the ROW acquisition phase. The following project feature will be implemented for either build alternative to minimize the effects of property acquisition on property owners:

- **PF COM-1**: Access to all properties for property owners and users will be maintained by the contractor during construction.

### 2.1.5 Utilities/Emergency Services

#### 2.1.5.1 Affected Environment

The study area for utilities and emergency services is the same as for land use and is shown in Figure 2.1-1. There are multiple utility lines and utility providers within the study area. Overhead utility poles operated by Pacific Gas and Electric (PG&E) are located along all four intersection legs and provide electricity service in the study area. AT&T also operates overhead lines along all four intersection legs, located on the PG&E poles, and underground lines close to the SR 116/121 intersection, providing telephone, television, and Internet services. Storm drain facilities are located underground along the intersection legs. There are no Comcast or Sonoma County Water Agency facilities within the study area. In addition, there are no sewer facilities in the study area; all properties use septic systems.

Fire protection for the project area is provided by the Schell-Vista Fire Protection District, which is part of the Sonoma County Fire and Emergency Services Department. The Schell-Vista Fire Protection District also provides emergency medical response. The district has one station located near the study area, at 22950 Broadway, Sonoma, CA 95476. The Sonoma County Sheriff’s Department provides law enforcement services to unincorporated areas of the county, including the project area. The California Highway Patrol provides law enforcement along all state routes within California, including SR 116 and SR 121 within the project vicinity, and assists local governments during emergencies when requested.

#### 2.1.5.2 Environmental Consequences

**Project-Level Impacts**

**Build Alternatives**

The impacts of both build alternatives would be very similar to one another. Both build alternatives would require utility relocations for PG&E utility poles and underground storm drain facilities. A total area of approximately 100 square feet would be excavated for utility pole relocation, and the depth of these excavations would range from approximately 5 to 13 feet below grade. The relocated utility poles would be placed along the new ROW line under both build alternatives. New and extended storm drains would tie into the existing storm drain system, and the depth of these excavations would generally be at the same depth as...
existing storm drain facilities. Locations of utilities to be relocated would be finalized during the design phase and detailed in the contract plans. Utility boxes (pull boxes) would also be required at each curb return, which are located at the curved section of the curb at the of an intersection. They would be a maximum of 3 feet deep.

Under the Roundabout Alternative, there may not be sufficient space for an emergency vehicle to pass other vehicles queued to enter the roundabout and could result in some increase to emergency response times. According to Federal Highway Administration’s “Roundabouts: An Informational Guide,” drivers should be educated about how to properly respond when an emergency vehicle is approaching the roundabout to minimize potential delays to emergency response (NCHRP, 2010). The guide includes the following advice for drivers:

“Do not enter a roundabout when an emergency vehicle is approaching on another leg. This will allow traffic within the roundabout to clear in front of the emergency vehicle. When an emergency vehicle is approaching, be sure to proceed beyond the splitter island\(^1\) of your approach leg to ensure the emergency vehicle has adequate room to turn and exit the roundabout at any approach.”

To minimize delays to emergency response, a minimization measure for driver education has been included below. With implementation of this measure, no permanent impacts to emergency services would occur.

**No Build Alternative**
The No Build Alternative would not impact existing utilities or emergency service operations.

**Construction Impacts**

**Build Alternatives**
The impacts of both build alternatives would be the same as one another. Caltrans would coordinate with all utility providers during the design phase of the project to incorporate effective design treatments and construction procedures to avoid adverse impacts to existing utilities and traffic during construction. Nonetheless, the potential exists during construction activities to encounter previously unknown utilities within the area of roadway improvements. In addition, utility relocations may require short-term, limited interruptions of service.

Project construction would be staged to maintain through traffic at the SR 116/121 intersection, although temporary lane closures would occur. These lane closures could interfere with

\(^1\) Splitter island – a median island used to separate opposing directions of traffic entering and exiting a roundabout.
emergency service providers; however, the impact can be minimized with the measures discussed below.

No Build Alternative

The No Build Alternative would not impact existing utilities or emergency service providers.

2.1.5.3 Project Features, Avoidance, Minimization, and/or Mitigation Measures

The following project features will be implemented:

- **PF UT-1:** Caltrans will coordinate relocation work with the affected utility companies to minimize disruption of services to customers in the area during construction. If previously unknown underground utilities are encountered, Caltrans will coordinate with the utility provider to develop plans to address the utility conflict, protect the utility if needed, and limit service interruptions. Any short-term, limited service interruptions of known utilities will be scheduled well in advance, and appropriate notification will be provided to users.

- **PF UT-2:** Caltrans will coordinate with emergency service providers and through the public information program to avoid emergency service delays by ensuring that all providers are aware well in advance of lane closures. A Transportation Management Plan will also be developed as part of the project to address traffic impacts from staged construction, lane closures, and specific traffic handling concerns such as emergency access during project construction.

The following avoidance and minimization measure will be implemented:

- **AMM UT-3:** A public education campaign will be implemented to inform area drivers, residents, bicyclists, and pedestrians about the new roundabout to minimize potential accidents and disruptions to emergency service providers, and it will include information on how drivers should respond when emergency vehicles are approaching the roundabout. The campaign will include measures such as:
  - Holding public meetings prior to opening the roundabout to traffic and/or giving presentations at local organization meetings;
  - Preparing news releases detailing what motorists, pedestrians, and bicyclists can expect during and after construction; and
  - Distributing an informational brochure to residents explaining how to navigate roundabouts (both in a vehicle and as a pedestrian or bicyclist).
2.1.6 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.1.6.1 Regulatory Setting
Caltrans, as assigned by the Federal Highway Administration, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 CFR 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the U.S. Department of Transportation regulations (49 CFR Part 27) implementing Section 504 of the Rehabilitation Act (29 U.S.C. 794). The Federal Highway Administration has enacted regulations for implementation of the 1990 Americans with Disabilities Act, including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the Americans with Disabilities Act requirements to federal-aid projects, including Transportation Enhancement Activities.

2.1.6.2 Affected Environment
The information in this section is from the Traffic Operations Analysis Report, SR 116/121 Intersection Improvements Project (November 2015) and the Intersection Control Evaluation (January 2016).

Roadways, Pedestrian/Bicycle Facilities, and Public Transportation Facilities
SR 116 and SR 121 are conventional two-lane highways with posted speed limits of 50 mph. Traveling north along SR 121/Arnold Drive, SR 121 has a northbound free right-turn lane that bypasses the intersection. Bonneau Road is a local two-lane county road that has a posted speed limit of 30 mph. Currently, the intersection is a four-way stop.

The intersection has limited facilities for pedestrians and no bicycle facilities. There is one existing sidewalk at the southwest corner of the intersection along SR 121/Arnold Drive and one existing crosswalk, which crosses SR 121/Arnold Drive at the south end of the intersection. This crosswalk connects the existing Park and Ride lot to the bus stop on the west side of the highway. The transit stops located adjacent to the intersection lack a pedestrian refuge or designated patron waiting area.
In the southeast quadrant of the SR 116/121 intersection, there is an existing Caltrans-operated Park and Ride lot with 47 spaces. It serves two bus stops for Sonoma County Transit Line 38, located just south of the intersection. Sonoma County Transit Line 32 also passes through this intersection, with a stop to the east on South Temec Circle.

**Traffic Operations Analysis Study Area and Years**

The study area for the traffic operations analysis includes the SR 116/121 intersection and the adjacent intersection of SR 121/SR 12 (Broadway), located approximately 4,600 feet east of the study intersection. The operational analysis evaluated existing and future traffic conditions. Existing conditions represent the year 2014. Opening year traffic forecasts were projected for the year 2020, interim year traffic forecasts were developed for 2030, and design year traffic forecasts were developed for 2040.

Existing queue lengths were observed at the intersection in July 2015 during morning and evening hours (7:15 to 8:15 a.m. and 4:15 to 5:15 p.m.) for the northbound, southbound, and westbound approaches. Additional evening peak-hour queue lengths were observed on Wednesdays and Thursdays in August 2015. The August 2015 queue lengths were found to be significantly longer than the queue lengths observed in July 2015.

Existing morning and evening peak-hour intersection traffic counts were collected on April 8, 2014, for a 3-hour morning (6:00 to 9:00 a.m.) period and a 3-hour evening (3:00 to 6:00 p.m.) period. The morning and evening peak hours for intersection traffic were observed to be 7:30 to 8:30 a.m. and 4:30 to 5:30 p.m., respectively. For the purposes of the traffic operations analysis, to account for field-observed queue volumes, it was agreed that year 2014 and year 2020 volumes would be increased by 15 percent.

**Existing and Future Year Traffic Conditions (No Build Alternative)**

Existing and future intersection delay and LOS were analyzed for the years 2014, 2020, 2030, and 2040 under no-build conditions. LOS is an indicator of the operating performance of a road or intersection. It rates congestion and varies on a scale from LOS A to LOS F, where LOS A represents stable flow, very slight delay and LOS E represents unstable flow, poor progression, and long cycle lengths. At LOS F, an intersection is considered over capacity and operates at forced-flow, jammed conditions. In accordance with Caltrans criteria, the traffic analysis used LOS D or better (LOS A, B, C, or D) to indicate intersections that function or will function in the future at an “acceptable” level of performance, while LOS E or F indicate an “unacceptable” level of congestion. Figure 2.1-7 shows the LOS scale for an unsignalized intersection, which has the same delay categories as a four-way stop intersection.
As indicated in Table 2.1-7, the study intersection is currently operating at unacceptable LOS E and F under existing year 2014. The wait time for traffic to cross the intersection is approximately 5 minutes in the morning peak hour and approximately 6 minutes in the evening peak hour. For future years, the no-build condition operations are projected to worsen, based on the overall intersection delay and the corresponding LOS. The wait time for traffic to cross the intersection worsens from approximately 5 minutes to approximately 10 minutes in the morning peak hour (7:30 to 8:30 a.m.), and from approximately 6 minutes to approximately 12 minutes in the evening peak hour (4:30 to 5:30 p.m.) by 2040.
### Table 2.1-7: Existing and No-Build Conditions: Intersection Delay and Level of Service

<table>
<thead>
<tr>
<th>Intersection Analysis Year</th>
<th>SR 121/116/Bonneau Road Approach</th>
<th>Control Type(^1)</th>
<th>AM Peak Hour (7:30 – 8:30 a.m.)</th>
<th>PM Peak Hour (4:30 – 5:30 p.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Delay Min</td>
<td>Sec</td>
</tr>
<tr>
<td>Existing Conditions (2014)</td>
<td>Eastbound</td>
<td>AWSC</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td></td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td></td>
<td>0</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td></td>
<td>6</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Opening Year No-Build Conditions (2020)</td>
<td>Eastbound</td>
<td>AWSC</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td></td>
<td>6</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td></td>
<td>0</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td></td>
<td>8</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>6</td>
<td>49</td>
</tr>
<tr>
<td>Interim Year No Build Conditions (2030)</td>
<td>Eastbound</td>
<td>AWSC</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td></td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td></td>
<td>0</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td></td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>7</td>
<td>38</td>
</tr>
<tr>
<td>Design Year No-Build Conditions (2040)</td>
<td>Eastbound</td>
<td>AWSC</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td></td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Northbound</td>
<td></td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td></td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td></td>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>

\(^1\) AWSC = All Way Stop Control


#### 2.1.6.3 Environmental Consequences

**Project-Level Impacts**

**Roadways, Pedestrian/Bicycle Facilities, and Public Transportation Facilities**

**Roundabout Alternative**

The Roundabout Alternative would include construction of a Class I 10-foot-wide shared-use path for pedestrians and bicyclists that would surround the roundabout at each roadway...
crossing. Each roadway crossing would include a striped crosswalk, pedestrian-scale lighting, and signage to alert motorists to the presence of pedestrians and bicyclists. All paths and crossings would meet current Americans with Disabilities Act standards. A 5-foot-wide strip separating the path from the roundabout traffic lanes would be constructed along all four legs of the intersection to provide a division between the traffic lanes, bicyclists, and pedestrians. Within the study area, bicyclists would have the option of using the Class II bicycle lanes along the highway shoulders while approaching and after exiting the roundabout. In lieu of merging with the circulating traffic at the roundabout approaches, the bicyclists would have the option to leave the Class II bicycle lanes via bicycle ramps and instead use the 10-foot-wide Class I shared-use path; therefore, the path would serve as a shared pedestrian/bicyclist facility for the approach, passage through, and exit of the roundabout.

The Roundabout Alternative would relocate the Park and Ride lot to the northeast quadrant of the intersection while maintaining the same number of spaces. The existing bus stops would also be relocated north along SR 116, adjacent to the new Park and Ride lot. Operation of the relocated Park and Ride lot and bus stops would not be affected by this shift because the layout and function of each would remain the same.

**Signalized Intersection Alternative**

The Signalized Intersection Alternative would include construction of new 6-foot-wide pedestrian sidewalks between the four intersection legs. All sidewalks and crossings would be Americans with Disabilities Act compliant. On the SR 116/Arnold Drive, SR 121/Arnold Drive, and SR 121/Fremont Drive intersection legs, bicycle lanes would be Class II compliant. Bicyclists would use the highway shoulders on the intersection approach. Through the intersection, bicyclists would have their own dedicated lane.

In the Signalized Intersection Alternative, the Park and Ride lot would remain in the southeast quadrant of the intersection, but it would be reconfigured. Access to the reconfigured Park and Ride lot would be from northbound SR 121/Arnold Drive, south of the intersection. To accommodate the 6-foot width requirement of the Class II bicycle lanes and not displace any of the existing properties along SR 121/Arnold Drive, the number of spaces in the Park and Ride lot would be reduced to 42 spaces, which is a reduction of 5 parking stalls.

**No Build Alternative**

The No Build Alternative would have no effect on existing pedestrian facilities or public transportation facilities, nor would it create any new pedestrian, bicycle, or public transportation facilities within the study area.
**Traffic Operations**

Tables 2.1-8, 2.1-9, 2.1-10, and 2.1-11 present the Roundabout Alternative and Signalized Intersection Alternative morning and evening peak-hour intersection delay, LOS, and queuing analysis for opening year 2020, interim year 2030, and design year 2040. To highlight the improved operations that can be expected with the two build alternatives, the tables also present the operations associated with the current intersection control and geometry for year 2014 conditions. As shown in the tables, both build alternatives significantly improve operations over the current configuration.

Queuing is the study of traffic behavior near a certain section where demand exceeds available capacity. Queues can occur at red lights, stop signs, bottlenecks, or any design-based or traffic-based flow constriction. This queuing analysis evaluated whether the through lanes and right- and left-turn pockets would be of sufficient length to accommodate all vehicles traveling or turning right or left.

Delay was estimated using the 2010 Highway Capacity Manual, incorporating appropriate heavy vehicle adjustment factors, peak-hour factors, and signal lost-time factors. See the Traffic Operations Analysis for a more detailed discussion on how intersection delay is estimated.

**Roundabout Alternative**

As shown in Tables 2.1-8 and 2.1-9, under the Roundabout Alternative, the study intersection is projected to operate at acceptable LOS under all conditions for the morning and evening peak hours. As shown in Tables 2.1-10 and 2.1-11, the queuing analysis indicates that the right- and left-turn pockets are of sufficient length to accommodate all vehicles turning right or left for all conditions except during the design year 2040 evening peak-hour conditions, in which the southbound left queue would exceed the required length of 237 feet by approximately 15 feet (less than a vehicle length). This is not expected to cause major delays to the through or left-turn movements. When compared to existing conditions, the following delay reductions during the morning peak hour (Table 2.1-8) are expected for the Roundabout Alternative:

- **For 2020 Opening Year Conditions:** The Roundabout Alternative is expected to reduce the delay by approximately 4 minutes, 50 seconds per vehicle.
- **For 2030 Interim Year Conditions:** The Roundabout Alternative is expected to reduce the delay by approximately 4 minutes, 50 seconds per vehicle.
- **For 2040 Design Year Conditions:** The Roundabout Alternative is expected to reduce the delay by approximately 4 minutes, 51 seconds per vehicle.
### Table 2.1-8: Morning Peak Hour (7:30–8:30 a.m.) Summary – Intersection Delay and Level of Service

<table>
<thead>
<tr>
<th>Intersection Analysis Year</th>
<th>SR 121/116/Bonneau Road Approach</th>
<th>No Build Alternative</th>
<th>Roundabout Alternative</th>
<th>Signalized Intersection Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Type of Facility¹</td>
<td>Type of Facility¹</td>
<td>Type of Facility¹</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LOS</td>
<td>Delay² Min</td>
<td>Sec</td>
</tr>
<tr>
<td>Existing Conditions</td>
<td></td>
<td>AWSC</td>
<td>F</td>
<td>1</td>
</tr>
<tr>
<td>(2014) 15% Increase</td>
<td></td>
<td></td>
<td>F</td>
<td>4</td>
</tr>
<tr>
<td>Eastbound</td>
<td></td>
<td>AWSC</td>
<td>0</td>
<td>43</td>
</tr>
<tr>
<td>Westbound</td>
<td></td>
<td></td>
<td>6</td>
<td>29</td>
</tr>
<tr>
<td>Northbound</td>
<td>AWSC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southbound</td>
<td>RNDBT</td>
<td></td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Overall</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opening Year Conditions</td>
<td>AWSC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2020) 15% Increase</td>
<td>RNDBT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>13</td>
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<tr>
<td>Westbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Northbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Southbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Overall</td>
<td>F</td>
<td></td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Interim Year Conditions</td>
<td>AWSC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2030)</td>
<td>RNDBT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Westbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Northbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Southbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Overall</td>
<td>F</td>
<td></td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Design Year Conditions</td>
<td>AWSC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2040)</td>
<td>RNDBT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>12</td>
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<tr>
<td>Westbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Northbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Southbound</td>
<td>F</td>
<td></td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Overall</td>
<td>F</td>
<td></td>
<td>0</td>
<td>9</td>
</tr>
</tbody>
</table>

¹ **AWSC** = All Way Stop Control; **Signal** = Signalized Intersection; **RNDBT** = Roundabout

² Overall LOS = Delay based on worst street approach for signalized intersections or the average of all approaches for the roundabout.

## Table 2.1-9: Evening Peak Hour (4:30 – 5:30 p.m.) Summary – Intersection Delay and Level of Service

<table>
<thead>
<tr>
<th>Intersection Analysis Year</th>
<th>SR 121/116/ Bonneau Road Approach</th>
<th>No Build Alternative</th>
<th>Roundabout Alternative</th>
<th>Signalized Intersection Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR 116/121/121 Intersection Improvements Project IS/EA 2-33</strong></td>
<td><strong>Type of Facility&lt;sup&gt;1&lt;/sup&gt;</strong></td>
<td><strong>LOS</strong></td>
<td><strong>Delay&lt;sup&gt;2&lt;/sup&gt;</strong></td>
<td><strong>LOS</strong></td>
</tr>
<tr>
<td><strong>Interpretation</strong></td>
<td><strong>Facility</strong></td>
<td><strong>Min</strong></td>
<td><strong>Sec</strong></td>
<td><strong>Min</strong></td>
</tr>
<tr>
<td><strong>Existing Conditions (2014)</strong></td>
<td><strong>Eastbound</strong></td>
<td>AWSC</td>
<td>E</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Westbound</strong></td>
<td></td>
<td>F</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td><strong>Northbound</strong></td>
<td></td>
<td>F</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Southbound</strong></td>
<td></td>
<td>F</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Overall</strong></td>
<td></td>
<td>F</td>
<td>6</td>
</tr>
<tr>
<td><strong>Opening Year Conditions (2020)</strong></td>
<td><strong>Eastbound</strong></td>
<td>AWSC</td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Westbound</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Northbound</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Southbound</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Overall</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td><strong>Interim Year Conditions (2030)</strong></td>
<td><strong>Eastbound</strong></td>
<td>AWSC</td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Westbound</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Northbound</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Southbound</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Overall</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td><strong>Design Year Conditions (2040)</strong></td>
<td><strong>Eastbound</strong></td>
<td>AWSC</td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Westbound</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Northbound</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Southbound</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Overall</strong></td>
<td></td>
<td>F</td>
<td>0</td>
</tr>
</tbody>
</table>

<sup>1</sup> AWSC = All Way Stop Control; Signal = Signalized Intersection; RNDBT = Roundabout

<sup>2</sup> Overall LOS = Delay based on worst street approach for signalized intersections or the average of all approaches for the roundabout.

## Table 2.1-10: Queuing Analysis for the Roundabout Alternative

<table>
<thead>
<tr>
<th>Intersection Analysis Year</th>
<th>SR 121/116/Bonneau Road Approach</th>
<th>Total Storage (ft)</th>
<th>Queue Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AM Peak Hour (7:30–8:30 a.m.)</td>
<td>PM Peak Hour (4:30 – 5:30 p.m.)</td>
</tr>
<tr>
<td><strong>Opening Year Conditions (2020) 15% Increase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastbound Left/Through/Right</td>
<td>-</td>
<td>30.3</td>
<td>29.6</td>
</tr>
<tr>
<td>Westbound Left/Through</td>
<td>-</td>
<td>80.7</td>
<td>118.4</td>
</tr>
<tr>
<td>Westbound Right</td>
<td>250</td>
<td>54.5</td>
<td>104.4</td>
</tr>
<tr>
<td>Northbound Left/Through/Right</td>
<td>-</td>
<td>39.9</td>
<td>95.6</td>
</tr>
<tr>
<td>Northbound Right</td>
<td>240</td>
<td>149.6</td>
<td>167.5</td>
</tr>
<tr>
<td>Southbound Left</td>
<td>237</td>
<td>184.3</td>
<td>181.4</td>
</tr>
<tr>
<td>Southbound Through/Right</td>
<td>-</td>
<td>181.2</td>
<td>15.2</td>
</tr>
<tr>
<td><strong>Interim Year Conditions (2030)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastbound Left/Through/Right</td>
<td>-</td>
<td>32.8</td>
<td>34.4</td>
</tr>
<tr>
<td>Westbound Left/Through</td>
<td>-</td>
<td>87.2</td>
<td>156.4</td>
</tr>
<tr>
<td>Westbound Right</td>
<td>250</td>
<td>61.6</td>
<td>104.5</td>
</tr>
<tr>
<td>Northbound Left/Through/Right</td>
<td>-</td>
<td>39.1</td>
<td>103.8</td>
</tr>
<tr>
<td>Northbound Right</td>
<td>240</td>
<td>206.4</td>
<td>207.8</td>
</tr>
<tr>
<td>Southbound Left</td>
<td>237</td>
<td>212.2</td>
<td>199.4</td>
</tr>
<tr>
<td>Southbound Through/Right</td>
<td>-</td>
<td>193.8</td>
<td>250.5</td>
</tr>
<tr>
<td><strong>Design Year Conditions (2040)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastbound Left/Through/Right</td>
<td>-</td>
<td>30.6</td>
<td>50.0</td>
</tr>
<tr>
<td>Westbound Left</td>
<td>224</td>
<td>56.5</td>
<td>113.9</td>
</tr>
<tr>
<td>Westbound Left/Through</td>
<td>-</td>
<td>50.8</td>
<td>99.3</td>
</tr>
<tr>
<td>Westbound Right</td>
<td>250</td>
<td>90.5</td>
<td>204.1</td>
</tr>
<tr>
<td>Northbound Left/Through/Right</td>
<td>-</td>
<td>50.0</td>
<td>184.6</td>
</tr>
<tr>
<td>Northbound Right</td>
<td>240</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Southbound Left</td>
<td><strong>237</strong></td>
<td>175.5</td>
<td><strong>252.2</strong></td>
</tr>
<tr>
<td>Southbound Through/Right</td>
<td>-</td>
<td>180.7</td>
<td>201.1</td>
</tr>
</tbody>
</table>

Bolded entries indicate queues exceed available storage.

1. Storage length is the length of the right- or left-turn lane. Storage length of “-“ represents a through lane, which exceeds 800 feet.

2. Queue length is the measure (in feet) of the length of cars that are in the through lanes or right- and left-turn lanes. Queue length is based on the maximum queue of the approach. This queuing analysis evaluated whether the through lanes and right- and left-turn pockets would be of sufficient length to accommodate all vehicles passing through or turning right or left.

## Table 2.1-11: Queuing Analysis for the Signalized Intersection Alternative

<table>
<thead>
<tr>
<th>Intersection Analysis Year</th>
<th>SR 121/116/Bonneau Road Approach</th>
<th>Total Storage (ft)</th>
<th>Queue Length (ft)&lt;sup&gt;3&lt;/sup&gt;</th>
<th>AM Peak Hour (7:30–8:30 a.m.)</th>
<th>PM Peak Hour (4:30 – 5:30 p.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opening Year Conditions (2020) 15% Increase</strong></td>
<td><strong>Eastbound Left/Through/Right</strong></td>
<td>-</td>
<td>83</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Westbound Left</strong></td>
<td>600</td>
<td>298</td>
<td>298</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Westbound Left/Through</strong></td>
<td>-</td>
<td>303</td>
<td>295</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Westbound Right</strong></td>
<td>400</td>
<td>40</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Northbound Left</strong></td>
<td>50</td>
<td>24</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Northbound Through</strong></td>
<td>-</td>
<td>154</td>
<td>351</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Northbound Right</strong></td>
<td>600</td>
<td>44</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Southbound Left</strong></td>
<td>600</td>
<td>198</td>
<td>230</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Southbound Through/Right</strong></td>
<td>-</td>
<td>516</td>
<td>366</td>
<td></td>
</tr>
<tr>
<td><strong>Interim Year Conditions (2030)</strong></td>
<td><strong>Eastbound Left/Through/Right</strong></td>
<td>-</td>
<td>86</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Westbound Left</strong></td>
<td>600</td>
<td>337</td>
<td>372</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Westbound Left/Through</strong></td>
<td>-</td>
<td>340</td>
<td>380</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Westbound Right</strong></td>
<td>400</td>
<td>43</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Northbound Left</strong></td>
<td>50</td>
<td>30</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Northbound Through</strong></td>
<td>-</td>
<td>156</td>
<td>395</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Northbound Right</strong></td>
<td>600</td>
<td>47</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Southbound Left</strong></td>
<td>600</td>
<td>204</td>
<td>263</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Southbound Through/Right</strong></td>
<td>-</td>
<td>538</td>
<td>365</td>
<td></td>
</tr>
<tr>
<td><strong>Design Year Conditions (2040)</strong></td>
<td><strong>Eastbound Left/Through/Right</strong></td>
<td>-</td>
<td>110</td>
<td>154</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Westbound Left</strong></td>
<td>600</td>
<td>417</td>
<td>543</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Westbound Left/Through</strong></td>
<td>-</td>
<td>440</td>
<td>574</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Westbound Right</strong></td>
<td>400</td>
<td>46</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Northbound Left</strong></td>
<td>50</td>
<td>38</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Northbound Through</strong></td>
<td>-</td>
<td>190</td>
<td>580</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Northbound Right</strong></td>
<td>600</td>
<td>52</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Southbound Left</strong></td>
<td>600</td>
<td>285</td>
<td>389</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Southbound Through/Right</strong></td>
<td>-</td>
<td>714</td>
<td>481</td>
<td></td>
</tr>
</tbody>
</table>

Bolded entries indicate queues exceed available storage.

1. Storage length is the length of the right- or left-turn lane. Storage length of "-" represents a through lane, which exceeds 800 feet.

2. Queue length is the measure (in feet) of the length of cars that are in the through lanes or right- and left-turn lanes. Queue length is based on the maximum queue of the approach. This queuing analysis evaluated whether the through lanes and right- and left-turn pockets would be of sufficient length to accommodate all vehicles passing through or turning right or left.

When compared to existing conditions, the following delay reductions are expected for the evening peak hour (Table 2.1-9) for the Roundabout Alternative:

- For 2020 Opening Year Conditions: The Roundabout Alternative reduces the delay by approximately 5 minutes, 57 seconds per vehicle.
- For 2030 Interim Year Conditions: The Roundabout Alternative reduces the delay by approximately 5 minutes, 56 seconds per vehicle.
- For 2040 Design Year Conditions: The Roundabout Alternative reduces the delay by approximately 5 minutes, 56 seconds per vehicle.

Overall, the Roundabout Alternative improves congestion and minimizes queues. On average, the Roundabout Alternative is expected to reduce congestion, queue length, and delay by 20 seconds per vehicle more than the Signalized Intersection Alternative during the morning peak hour. During the evening peak hour, on average, the Roundabout Alternative is expected to reduce congestion, queue lengths, and delay by 25 seconds per vehicle more than the Signalized Intersection Alternative.

The Interim Roundabout design option would be implemented first to allow drivers to become familiar with roundabout navigation and simplify movements. Only one quadrant of the Interim Roundabout would have two lanes, but two quadrants of the ultimate roundabout configuration would have two lanes. Under the Interim Roundabout, the LOS is expected to remain at acceptable levels until approximately year 2030. When the projected traffic volumes result in unacceptable operations, consideration will be given to expand to the ultimate Roundabout configuration. When the ultimate Roundabout is warranted, SCTA will program a job to restripe the roundabout to the ultimate hybrid multilane configuration. According to the projections, the 2040 Roundabout Alternative ultimate configuration would have a lower delay time than the 2030 Interim Roundabout. This is because the Interim Roundabout would not be able to handle the additional capacity as well as the ultimate roundabout configuration.

**Signalized Intersection Alternative**

As shown in Tables 2.1-8 and 2.1-9, under the Signalized Intersection Alternative, the study intersection is projected to operate at acceptable LOS under all conditions, overall. Although the eastbound and westbound approaches operate at unacceptable LOS during the design year 2040 evening conditions, this would not cause major delays to the overall operation and function of the intersection. As shown in Tables 2.1-10 and 2.1-11, the queuing analysis indicates that the turn pockets are of sufficient length to accommodate all vehicles turning right or left for all conditions. When compared to existing conditions, the following delay reductions during the morning peak hour (Table 2.1-8) are expected for the Signalized Intersection Alternative:
• For 2020 Opening Year Conditions: The Signalized Intersection Alternative is expected to reduce the delay by 4 minutes, 31 seconds per vehicle.
• For 2030 Interim Year Conditions: The Signalized Intersection Alternative is expected to reduce the delay by 4 minutes, 31 seconds per vehicle.
• For 2040 Design Year Conditions: The Signalized Intersection Alternative is expected to reduce the delay by 4 minutes, 22 seconds per vehicle.

When compared to existing conditions, the following delay reductions are expected for the evening peak hour (Table 2.1-9) for the Signalized Intersection Alternative:

• For 2020 Opening Year Conditions: The Signalized Intersection Alternative reduces the delay by 5 minutes, 38 seconds per vehicle.
• For 2030 Interim Year Conditions: The Signalized Intersection Alternative reduces the delay by 5 minutes, 32 seconds per vehicle.
• For 2040 Design Year Conditions: The Signalized Intersection Alternative reduces the delay by 5 minutes, 14 seconds per vehicle.

The Signalized Intersection Alternative improves congestion and minimizes queues, but not as much as the improvements under the Roundabout Alternative.

No Build Alternative

Future traffic conditions for the No Build Alternative are shown in Table 2.1-7. Under future no-build conditions, intersection delay and LOS would continue to worsen. By 2040, the wait time for traffic to cross the intersection worsens from approximately 5 minutes to approximately 10 minutes in the morning peak hour, and from approximately 6 minutes to approximately 12 minutes in the evening peak hour.

Sensitivity Analysis

A sensitivity analysis was completed to test if the proposed geometry can accommodate variations in traffic as observed in increased traffic volumes from the 2015 counts and 2014 counts. This was done by increasing the traffic volumes for year 2030 and year 2040 by 6.4 and 4.6 percent for morning and evening peak hours, respectively. The percentage increases applied were based on the observed increases in traffic volumes from the 2015 counts and 2014 counts. With these increased volumes, the study intersection is projected to operate at LOS B under all conditions for the Roundabout Alternative. The queuing portion of this analysis indicated that the turn pockets are of sufficient length to accommodate all vehicles turning right or left for all conditions except for the following:

• In the 2030 interim year, the northbound right and southbound left queues exceed the turn pocket length by no more than 38 and 59 feet, respectively (approximately two vehicles).
The analysis indicates that the northbound right-turn and southbound left-turn lanes reach the queue capacity during 2030 conditions. Consideration for expanding the roundabout to its ultimate configuration should be given at that time.

- In the 2040 design year, the southbound left queue exceeds the queue length by no more than 26 feet (approximately one vehicle). These queue lengths are not expected to cause major delays or spillbacks to the through or left-turn movements; therefore, the impacts are considered minimal. The Roundabout Alternative has a free northbound right turn, which mitigates the queue projected in the 2030 interim year.

Under the Signalized Intersection Alternative, the study intersection is projected to operate at LOS D under 2030 interim year conditions and LOS D and E during morning and evening peak periods under 2040 design year conditions, respectively. The queuing portion of this analysis indicated that the turn pockets are of sufficient length to accommodate all vehicles turning right or left for all conditions.

**Benefit/Cost Performance**

The Intersection Control Evaluation (January 2016) evaluated the benefit/cost ratio for the build alternatives. The benefit/cost ratio factors in collision costs of predicted crashes, delay costs, fuel and greenhouse gas costs, and overall project costs, including operations and maintenance for each build alternative. The benefit/cost ratio for the Roundabout Alternative compared to the Signalized Intersection Alternative is 13.3. This value factors in $23.9 million in savings for the Roundabout Alternative versus the Signalized Intersection Alternative when considering collision costs of predicted crashes, delay costs, and fuel costs. The roundabout is $1.8 million more expensive to construct and maintain over 20 years, but it has greater expected savings over the long term.

**Access for Residents and Businesses**

**Build Alternatives**

The Roundabout Alternative and Signalized Intersection Alternative would modify the access of one commercial parcel within the study area – APN 128-461-014. Left turns would be prohibited into and out of this parcel. To travel westbound along SR 121/Fremont Drive from this parcel, users would be required to make a right turn out of the property, head eastbound along SR 121/Fremont Drive, and then make a u-turn at a break in the median. Users traveling westbound on SR 121/Fremont Drive who want to access this property would also no longer be able to turn left into the property. They would need to continue westbound to the intersection and either travel around the roundabout or make a u-turn at the signal. Approximate additional travel distances and times under both of these scenarios are presented in Table 2.1-12. This property would be affected by both build alternatives, particularly if patrons decide not to frequent the business due to the access modification. However, this is not anticipated because
the additional drive time to complete the access modification is less than 30 seconds for each scenario, which is a minimal amount of time. In addition, while access would be modified for this parcel, it would not be eliminated. Patrons of this parcel would still be able to access this property. Therefore, a substantial impact to this property is not anticipated from either build alternative.

Table 2.1-12: Access Modifications

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Roundabout Alternative</th>
<th>Signalized Intersection Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Additional Distance (feet)</td>
<td>Additional Drive Time Required* (seconds)</td>
</tr>
<tr>
<td>Turning from 15 Fremont Drive (trying to head westbound on SR 121/Fremont Drive)</td>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>Turning into 15 Fremont Drive from westbound SR 121/Fremont Drive</td>
<td>1,000</td>
<td>27</td>
</tr>
</tbody>
</table>

* This time is based on the minimum amount of time it would take to complete the access modification, assuming no congestion. Completing this access modification during the peak hour would take longer.

No Build Alternative

Under the No Build Alternative, existing access for residents and businesses in the study area would not change.

Construction Impacts

Build Alternatives

The impacts of both build alternatives would be very similar to one another. Construction work for either build alternative would be done primarily during daylight hours from 7:00 a.m. to 6:00 p.m.; however, there may be some work during night-time hours to avoid temporary highway closures for tasks that could interfere with traffic or create safety hazards. Examples of these tasks include striping operations, traffic control setup, installation of storm drain crossings, and asphalt pavement mill and overlay. The entire intersection would not be closed during construction; however, temporary lane closures would occur. It is anticipated that temporary closure of existing transit or pedestrian facilities would occur at times and may require temporary rerouting of transit service due to intersection work. In addition, any bicyclists traveling along SR 116/121 could also be rerouted due to construction activities.
These temporary lane closures could cause confusion, inconvenience, and minor additional delay for users of the intersection.

The existing Park and Ride lot would be partially, and potentially fully, closed during construction. Approximately 60 percent of the lot would remain open during portions of the construction period while the remaining portion of the lot is used as a construction staging area; however, full closure of the Park and Ride lot may be necessary at times due to construction activities in the southeast quadrant of the intersection.

**No Build Alternative**
The No Build Alternative would have no effect on the transportation system during construction.

### 2.1.6.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures

The public has been involved with the project through an informational meeting that was held in November 2014. The public, including pedestrian and bicycle advocates, had the opportunity to learn about the impacts and proposed measures during circulation of the Draft Initial Study/Environmental Assessment (IS/EA). The following project feature and avoidance and minimization measure will be implemented:

- **PF T-1:** A Transportation Management Plan will be developed and implemented as part of the project construction planning phase. The Transportation Management Plan will address these potential impacts to circulation of all modes (i.e., transit, bicycles, pedestrians, and private vehicles). Highway and/or pedestrian access to all occupied residences and businesses and respective parking lots will be maintained during project construction. The Transportation Management Plan may provide for contracting with local agencies for traffic personnel, especially for special event traffic through or near the construction zone. It will also include a public awareness campaign to notify users of the intersection of potential lane closures.

- **AMM T-2:** If a full closure of the existing Park and Ride lot is required, Caltrans will redirect patrons to other associated lots, such as the Petaluma, Lakeville Highway Park and Ride lot, located at Highway 101 and SR 116; South Petaluma Park and Ride lot, located at Highway 101 and South Petaluma Boulevard; or the Novato, Black Point Park and Ride lot, located at Route 37 and Atherton Avenue.
2.1.7 Visual/Aesthetics

2.1.7.1 Regulatory Setting

NEPA establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings (42 U.S.C. 4331[b][2]). To further emphasize this point, the Federal Highway Administration in its implementation of NEPA (23 U.S.C. 109[h]) directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

CEQA establishes that it is the policy of the state to take all action necessary to provide the people of the state “with…enjoyment of *aesthetic*, natural, scenic and historic environmental qualities” (CA Public Resources Code [PRC] Section 21001[b]).

2.1.7.2 Affected Environment

The information in this section is from the *Visual Impact Assessment* (March 2016). The visual analysis followed Federal Highway Administration’s publication entitled *Visual Impact Assessment for Highway Projects* (FHWA, 1981). The analysis includes visual quality criteria, landscape units, visual character, viewer exposure, and viewer sensitivity. The study area for visual/aesthetics is the same as the study area for land use, shown in Figure 2.1-1. The regional landscape of the project corridor is characterized by rolling hills and valleys with oak savanna-type vegetation in the dryer locations and more heavily forested hillsides in wetter locations. Most of the valley locations are a mix of agricultural lands and development. Specific to the project area, the southern side of the intersection is a mix of commercial development, while the northern side is more generally agricultural. These agricultural areas have been designated as Scenic Landscape Units by Sonoma County. In addition, both SR 116 and SR 121 are designated Scenic Routes by the County.

The types of viewers within the study area are highway users and highway neighbors, including business owners and employees, and customers, residents, and tourists. Existing viewer sensitivity is expected to be high in the study area because the Sonoma County General Plan 2020 has indicated a high degree of sensitivity to the visual environment. Particularly sensitive groups to changes in the visual environment would be local residents, business owners, employees and customers, and tourists.

A viewshed is the area normally visible from an observer’s location and is limited by the screening/obstruction effects of any vegetation or structures or enhanced by vistas. For the SR 116/121 intersection, the viewshed for highway travelers is one of a rural area with fields and vineyards and clusters of commercial development. Trees may also be seen along the fence
lines. More distant views would include the rolling hills in the background. For those viewers on adjacent properties, views into the project area are that of a large intersection, including the existing Park and Ride lot. Due to congestion at this intersection, lines of traffic are frequent elements of the view. Mid- and background views include the surrounding fields and more distant hillsides.

Caltrans evaluates visual quality by assessing three characteristics of the project viewshed: vividness, intactness, and unity. Vividness is the visual power or memorability of landscape components as they combine in distinctive visual patterns. Intactness is the visual integrity of the natural and man-built landscape and its freedom from encroaching elements. Unity is the visual coherence and compositional harmony of the landscape considered as a whole. Along the study area roadways, the existing rural character gives this view a moderately high visual quality, with high vividness and moderately high intactness and unity. From the perspective of the commercial areas, the existing visual quality of this landscape unit, in general, is moderate, with moderate vividness, intactness, and unity due to the presence of low buildings, parking facilities, and vegetation. From the perspective of the agricultural areas in the northern portion of the study area, the visual quality is high, with high vividness and unity and moderately high intactness due to the scenic nature of the views.

Federal Highway Administration analysis methodology recommends selecting key viewpoints that represent the potential visual effects of the project. The key viewpoints include a representation of all critical visual elements of the proposed project and viewer group types, and they represent views that might be potentially affected by the project. One key view was selected within the project area:

- **Key Viewpoint, Northbound SR 121/Arnold Drive, south of the intersection:** This viewpoint is from the perspective of the highway traveler from the northbound lanes of SR 121/Arnold Drive, looking north towards the intersection. The view shows the approach to the intersection, with the free right-turn lane splitting off in front of the Vineyard Inn Hotel, and commercial development in the foreground. The overall visual quality of the view is moderate, with moderate vividness, intactness, and unity.

### 2.1.7.3 Environmental Consequences

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. These impacts can be beneficial or detrimental. A generalized visual impact assessment process is illustrated in Figure 2.1-8. Table 2.1-13 provides a reference for determining levels of visual impact by combining resource change and viewer response. The viewer impact ratings definitions include:
- **Low**: Minor adverse change to the existing visual resource, with low viewer sensitivity to any change.
- **Moderate-Low**: Low adverse change to the visual resource with a moderate viewer response, or moderate negative change to the resource with a low viewer response.
- **Moderate**: Adverse change cannot be described as minor or viewer response is thought to be greater.
- **Moderate-High**: Moderate adverse change in the visual resource with high viewer response or high adverse change with a moderate viewer response.
- **High**: High level of adverse change in character or a high level of sensitivity to the change such that architectural design and landscape treatments cannot mitigate impacts. An alternative project design may be required to avoid adverse impacts.

![Figure 2.1-8: Visual Impact Assessment Process Concept Diagram](image)

**Table 2.1-13: Visual Impact Ratings using Viewer Response and Resource Change**

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<tr>
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<td>High (H)</td>
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</table>
Project-Level Impacts

Roundabout Alternative

As the traveler approaches the intersection, the proposed Roundabout Alternative would generally widen the existing intersection area from its current size and shift the configuration slightly to the northeast from its current location to accommodate the roundabout. Some of this extra width would be taken up with medians, which potentially could have an accent paving that would form a visual break to the roadway surface on either side. In addition, based on the proposed design, approximately 106 trees would be removed under this alternative from along the intersection legs.

In addition to the roadway paving, a new Park and Ride lot would be constructed in the corner of the existing field in the northeast quadrant of the intersection. The ROW for the new parking facility would be approximately 50 feet wide along portions of SR 116/Arnold Drive and SR 121/Fremont Drive. Islands would separate the highway from the parking area, and trees would be replanted around the new Park and Ride lot. This new parking area would be within the area designated as a Scenic Landscape Unit by the County. Additional elements brought into the intersection include a shared-use path for bicyclists and pedestrians. These would be new elements to the intersection’s visual environment because no paths currently exist.

Lighting of the new highways is not expected to substantially increase glare because the new intersection and approach roads would be lit in a similar fashion to the existing. In addition to the street lights, the Roundabout Alternative would add warning beacons on the approaches to the intersection to warn motorists of the upcoming intersection. These flashing lights would add new elements of glare on the highway. The Roundabout Alternative would also add additional street lights in the area of the Park and Ride lot, which is currently an unlit field.

These visual changes are demonstrated through the effects on the key viewpoint, described in Section 2.1.7.2, Affected Environment. Photographs were taken of the existing view for the key viewpoint and are compared to rendered simulations developed for the key viewpoint. Descriptions of potential changes to the visual quality are as follows:

- **Key Viewpoint, Northbound SR 121/Arnold Drive, south of the intersection:** The overall intersection area would be larger than the current layout, including the Park and Ride lot. The new, larger Park and Ride lot in the northeast quadrant would also add additional paving within the intersection area; however, the inclusion of plantings, particularly replacement of the row of trees currently found along the fence line of the field with a new row of trees, would help to keep a similar visual character to the intersection area. It is anticipated that viewers, including local businesses owners, highway and transit commuters, and tourists to the area, would be very sensitive to the changes in the area because both the highways and the fields/vineyards are considered scenic by Sonoma
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

County, as stated in General Plan 2020. The resulting changes to the views within the intersection are not expected to be substantial with the Roundabout Alternative. The addition of plantings and elements, such as decorative paving, would break up the areas of paving and provide the viewer a way to process what they see in conjunction with a known element.

Figure 2.1-9 shows the existing view and post-construction view of the key viewpoint. Due to these changes in the visual environment, the changes in visual character and quality would be low, but the viewer response to these changes would be moderately high; therefore, the overall visual impact of the Roundabout Alternative would be moderate.

Minimization measures depicted in the simulation include replacement plantings. Aesthetic treatments to structures are representative only. Actual types of treatments and landscaping would be designed in collaboration with Caltrans’ District Landscape Architect during the design phase.

Figure 2.1-9: Roundabout Alternative – Key Viewpoint, Northbound SR 121/Arnold Drive, South of the Intersection

**Signalized Intersection Alternative**

Under the Signalized Intersection Alternative, the existing intersection would be considerably widened to accommodate additional turn lanes. The existing free right turn in front of the Vineyard Inn Hotel would be removed, although the paving would stay as part of the Park and
Ride lot. A total of 138 trees, from each of the 4 legs of the interchange, would be removed under this alternative. Some of these trees would be replanted within the newly proposed ROW, primarily along the northern and eastern legs of the intersection.

Compared to current conditions, the Signalized Intersection Alternative would increase the amount of paving at the intersection, which would be built out from the edge of ROW on all four intersection legs. There would be no medians within the intersection that could accommodate plantings or accent/decorative paving to break up the large expanses of concrete. The intersection would appear much more urban in character and width than its rural setting would suggest, creating a visual imbalance for viewers.

The Park and Ride lot would remain in its existing location, and the existing free right turn at SR 121/Fremont Drive would be removed. The area of paving for the Park and Ride lot would remain essentially the same. A new bus stop would be located north of the intersection, along SR 116/Arnold Drive, which would require the Park and Ride users to cross SR 121/Fremont Drive, similar to what is currently required. Except for the bus stop, no additional paving would be associated with the Park and Ride lot under this alternative.

As with the Roundabout Alternative, Class II bicycle lanes would be constructed along the highway shoulders. In addition, 6-foot-wide sidewalks for pedestrians are additional features that would be brought into the intersection as new elements to the study area’s visual environment because no sidewalks currently exist. New signal poles and lights would also be required as part of this alternative to accommodate the new lanes. Lighting of the new highways is not expected to substantially increase glare because the new intersection and approach roads would be lit in a similar fashion to the existing. In addition to the street lights, the Signalized Intersection Alternative would add warning beacons on the approaches to the intersection to warn motorists of the upcoming intersection and signal poles and lights. These flashing lights and signals would add new elements of glare on the highway. The Signalized Intersection Alternative would also have additional lights at the new bus pad; however, this area is much smaller than the Park and Ride lot, so the expected increase in glare would be less than under the Roundabout Alternative.

These visual impacts are demonstrated through the effects on the key viewpoint, described in Section 2.1.7.2, Affected Environment. Photographs were taken of the existing view and are compared to rendered simulations developed for the key viewpoint. Descriptions of potential changes to the visual quality are as follows:

- **Key Viewpoint, Northbound SR 121/Arnold Drive, south of the intersection:** The overall intersection and intersection legs would appear much wider than the existing; therefore, they would appear much more urban in character than the current intersection. It...
is anticipated that viewers, including local businesses owners, highway and transit commuters, and tourists to the area would be very sensitive to the changes in the area because both the highways and the fields/vineyards are considered scenic by Sonoma County, as stated in General Plan 2020. The resulting changes to the views within the intersection are not expected to be substantial; however, there are large changes to the visual character of the intersection due to its more urban character.

Figure 2.1-10 shows the existing view and post-construction view of the key viewpoint. Due to these changes in the visual environment, the changes in visual character and quality would be moderately low, but the viewer response to these changes would be moderately high; therefore, the overall visual impact of the Signalized Intersection Alternative would be moderate.

Minimization measures depicted in the simulation include replacement plantings. Aesthetic treatments to structures are representative only. Actual types of treatments and landscaping would be designed in collaboration with Caltrans’ District Landscape Architect during the design phase.

**Figure 2.1-10: Signalized Intersection Alternative – Key Viewpoint, Northbound SR 121/Arnold Drive, South of the Intersection**
No Build Alternative
Activities that would occur under the No Build Alternative include routine maintenance of the project corridor. The intersection would not be expanded, so the views would remain essentially the same as the current views both on and off the corridor. The increase in traffic congestion would be expected to change the overall visual quality of the corridor over time, with views that reflect more traffic queues than current views.

Construction Impacts

Build Alternatives
The visual impacts of both build alternatives would be the same as one another. Construction of the build alternatives is anticipated to last approximately 15 months. The visual environment would be disturbed during this period. Most of the disturbance would include the presence of construction vehicles, storage of materials, construction signage, demolition of the existing paving, and construction of the new project elements. Depending on the location of the viewer, these impacts could range from no impact to a moderate impact during demolition and reconstruction of the build alternatives.

No Build Alternative
There would be no visual impact associated with the No Build Alternative during the construction period. The intersection would not be expanded, and there would be no construction equipment or activities present at the intersection.

2.1.7.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures
To address the adverse visual changes associated with the proposed build alternatives, the following project features and avoidance and minimization measures are recommended. The project features and measures proposed below would aid in reducing the adverse visual impacts of the project.

Vegetation and Landscape Plantings
- **PF V-1**: Beginning with preliminary design and continuing through final design and construction, save and protect as many existing trees in the project area as feasible.
- **PF V-2**: Survey exact locations for trees and include in plan set during the design phase.
- **PF V-3**: Plant parkway strips, where feasible, using rows of trees to replace in-kind the removed trees and to break up the areas of paving.
- **PF V-4**: To the extent feasible, use California native species as part of the planting palette to replace the removed trees.
- **PF V-5**: Plant trees in the new Park and Ride area to replace in-kind the removed trees.
- **PF V-6**: Include an extended 3-year maintenance period as part of the construction period, either through the construction contract or a separate contract, to provide a single source
of maintenance through the establishment period. This will provide consistency to ensure that the replanted trees have the best chance of succeeding.

Decorative Paving and Fencing and Barriers

- **AMM V-7**: Provide decorative paving in all medians and parkway strips either too narrow to plant, or where planting is not easily maintained, to break up the areas of paving. Decorative paving shall consist of a texture and color that contrasts with adjacent sidewalk or roadway paving.
- **PF V-8**: To the extent feasible, design replacement fencing to comply with Sonoma County Fencing Solutions Guidelines.
- **AMM V-9**: The center of the roundabout will be designed in collaboration with Caltrans’ District Landscape Architect during the design phase in order to block the line of sight through the roundabout. The center of the roundabout could include decorative paving, a large boulder, or a similar visual element.

Stormwater Treatment Facilities

- **AMM V-10**: Beginning with preliminary design and continuing through final design and construction, use drainage and water quality elements, where required, that maximize the allowable landscape so that additional trees and/or decorative paving can be used.
- **AMM V-11**: Design biotreatment areas so that they appear to be a natural landscape feature, such as a dry streambed or a riparian pool, to break up areas of paving. They should be shaped in an informal, curvilinear manner to the greatest extent possible.
- **AMM V-12**: Basin slope grading should incorporate slope rounding, variable gradients, and be similar to the surrounding topography to de-emphasize the edge. If a wall or hard feature is necessary, it should be worked into the overall design concept.
- **PF V-13**: Basins should be designed so that chain-link perimeter fencing is not required.
- **PF V-14**: Design all visible concrete structures and surfaces to visually blend with the adjacent landscaping and natural plantings to reduce the effect of additional paving.
- **AMM V-15**: Limit the use of bioswales within corridor landscape areas. If they must be used, locate them in nonobtrusive areas and design should appear natural to the greatest extent possible.
2.1.8 Cultural Resources

2.1.8.1 Regulatory Setting

The term “cultural resources,” as used in this document, refers to the “built environment” (e.g., structures, bridges, railroads, water conveyance systems), places of traditional or cultural importance, and archaeological sites (both prehistoric and historic), regardless of significance. Under federal and state laws, cultural resources that meet certain criteria of significance are referred to by various terms including “historic properties,” “historic sites,” “historical resources,” and “tribal cultural resources.” Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places. Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800). On January 1, 2014, the First Amended Section 106 Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and Caltrans went into effect for Caltrans projects, both state and local, with Federal Highway Administration involvement. The Programmatic Agreement implements the Advisory Council on Historic Preservation’s regulations (36 CFR 800), streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The Federal Highway Administration’s responsibilities under the Programmatic Agreement have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 U.S.C. 327).

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the “use” of land from historic properties (in Section 4[f] terminology—historic sites). See Appendix B for specific information about Section 4(f).

CEQA requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as “unique” archaeological resources. California Public Resources Code (PRC) Section 5024.1 established the California Register of Historical Resources and outlined the necessary criteria for a cultural resource to be considered eligible for listing in the California Register of Historical Resources and, therefore, a historical resource. Historical resources are defined in PRC Section 5020.1(j). In 2014, Assembly Bill 52 added the term “tribal cultural resources” to CEQA, and Assembly Bill 52 is commonly referenced instead of CEQA when discussing the process to identify tribal cultural resources (as well as identifying measures to avoid, preserve, or mitigate effects to them). Defined in PRC Section 21074(a), a
tribal cultural resource is a California Register of Historical Resources or local register eligible site, feature, place, cultural landscape, or object that has a cultural value to a California Native American tribe. Tribal cultural resources must also meet the definition of a historical resource. Unique archaeological resources are referenced in PRC Section 21083.2.

PRC Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the National Register of Historic Places listing criteria. It further requires Caltrans to inventory state-owned structures in its ROW.

2.1.8.2 Affected Environment

This section summarizes the Archaeological Survey Report (February 2016), the Historic Resources Evaluation Report (February 2016), the Historic Property Survey Report (February 2016), the Finding of No Adverse Effect (April 2016), and the Archaeology Phased Identification Plan (2016) prepared for this project.

The study areas for cultural resources are referred to as the area of potential effects. The area of potential effects was established to include all potential direct and indirect effects to cultural resources that may result from the proposed project and includes built environment and archaeological resources. Separate area of potential effects boundaries were established for archaeological resources and the built environment, which may include buildings, structures, objects, and cultural landscapes. The area of potential effects was signed on February 1 and 4, 2016, by the Caltrans Project Manager, Archaeologist, and Architectural Historian.

The area of potential effects for archaeology is defined horizontally and vertically. In some cases, this includes parcels immediately adjacent to the existing ROW. The horizontal area of potential effects consists of an irregularly shaped area that encompasses the SR 116/121 intersection and extends from the intersection approximately 1,400 feet north along SR 116/Arnold Drive; 1,125 feet west along Bonneau Road; 1,500 feet south along SR 116; and 2,190 feet east along SR 121. On the southeast side of the intersection, the area of potential effects includes the road shoulder and the existing Park and Ride lot, as well as approximately 190 feet of Maffei Road. Northeast of the intersection, the area of potential effects extends into an undeveloped agricultural field to a maximum width of 500 feet from the road edge. Southwest of the intersection, the area of potential effects encompasses the road shoulder. Northwest of the intersection, the area of potential effects includes the road shoulder along Bonneau Road and extends west of the intersection approximately 100 feet onto private property. The vertical area of potential effects ranges between 4 feet within the proposed highway realignment, 6 feet in areas of utility and drainage work, and 5 to 13 feet for utility pole replacement.

The architectural area of potential effects consists of an irregularly shaped area that encompasses the SR 116/121 intersection and extends from the intersection approximately
1,700 feet north along SR 116/Arnold Drive; 1,500 feet west along Bonneau Road; 1,500 feet south along SR 116; and 3,400 feet east along SR 121, as well as parcels with buildings or structures adjacent to the existing and proposed ROW that could be directly or indirectly affected by project construction or operation. On the southeast side of the intersection, the architectural area of potential effects includes all properties adjacent to the road, extending between 400 and 1,000 feet from the road edge. On the northeast side of the intersection and north of SR 121, the architectural area of potential effects includes agricultural fields and buildings adjacent to the road extending 1,100 feet north of SR 121. Northwest of the intersection, the architectural area of potential effects includes the commercial, residential, and agricultural parcels adjacent to SR 116 and Bonneau Road, extending 1,100 feet west of SR 116. Southwest of the intersection, the architectural area of potential effects includes portions of properties adjacent to Bonneau Road and SR 116, extending between 1,000 and 1,550 feet west of SR 116.

**Tribal Cultural Resources**

CEQA cultural resources consultation for this project began on February 17, 2015, prior to the implementation of Assembly Bill 52 and included outreach to Native American contacts provided by the Native American Heritage Commission (summarized in Table 2.1-14). Caltrans Office of Cultural Resources has determined no additional consultation is required to address Assembly Bill 52; therefore, Tribal Cultural Resources will not be further addressed in this document.

**Archaeological Resources**

A records and information search was conducted in February 2014 to identify previous cultural resources investigations and previously recorded cultural resources in and within a 1-mile study area around the archaeological area of potential effects and to assess sensitivity for intact buried historic and prehistoric archaeological resources. This search included a review of the National Register of Historic Places, California Register of Historical Resources, California Inventory of Historic Resources, California Historical Landmarks, California Points of Historical Interest listing, Office of Historic Preservation Historic Property Data File, Caltrans Cultural Resources Database, and Caltrans State and Local Bridge Survey. No archaeological resources were previously recorded within the archaeological area of potential effects.

The records search identified seven previous studies that were conducted within the archaeological area of potential effects. The search identified the Big Bend Farm Complex (60 Bonneau Road) as the only previously documented historic period resource within the archaeological area of potential effects. The Big Bend Farm Complex was determined ineligible for both the National Register of Historic Places and the California Register of
Historic Resources. In addition, six other resources were identified within the 1-mile study area but outside of the area of potential effects.

Archaeological field surveys of the archaeological area of potential effects were conducted on February 13 and May 26, 2015. One parcel, APN 142-081-015, was unable to be surveyed due to lack of access. Survey of this parcel will be conducted at a later date once access is granted per the protocol outlined in the project’s Archaeology Phased Identification Plan (2016) and per Stipulation X.II.2 of the Programmatic Agreement. Results of the additional survey work will be submitted to Caltrans for review and approval. No prehistoric or historic period archaeological sites were identified in the archaeological area of potential effects during the surveys. Two historic period concrete bridges, both spanning Yellow Creek, were observed during surveys, one along (north-south) Bonneau Road between the properties at 55 and 75 Bonneau Road and the other along Arnold Drive at 23150 Arnold Drive.

The buried sites analysis, based on detailed soil maps, indicates that the types of soil present within the archaeological area of potential effects have a low potential for buried archaeological resources; therefore, subsurface investigations are not required.

If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

If Caltrans Professionally Qualified Staff determines that cultural materials contain human remains, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains. Caltrans’ Cultural Resources Studies Office will contact the Sonoma County Coroner. Pursuant to CA PRC Section 5097.98, if the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission, which will then notify the Most Likely Descendent. Caltrans, District 4, Cultural Resources Studies Office will work with the Most Likely Descendent on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

**Built Environment Resources**

A record search was conducted in February 2015 for an area within a 0.25-mile radius around the architectural area of potential effects. In addition, field surveys and evaluations were completed in March 2015 to establish the physical history of the buildings and structures. The built environment contains a combination of more-recently constructed commercial properties, industrial and warehouse properties, and older houses, some of which currently serve business purposes. Most of the properties in the architectural area of potential effects older than 50 years have been modified over the years.
Surveys of the built environment within the architectural area of potential effects identified 10 properties with buildings constructed on or before 1967. These 10 properties were formally evaluated for inclusion in the National Register of Historic Places and the California Register of Historical Resources. Eight properties were found ineligible for inclusion in the National Register of Historic Places because they do not possess sufficient historical significance and/or integrity to be considered eligible for listing in either of these two registers. One property, the Big Bend Farm Complex, was previously determined ineligible for the National Register of Historic Places, and the current investigation found that it still appears ineligible for both the National Register of Historic Places and the California Register of Historical Resources. Of the last property, the Vineyard Inn Hotel, the northern triangular-shaped portion of the parcel is eligible for inclusion in the National Register of Historical Places at the local level of significance under Criterion C as a distinctive and intact example of the Spanish Revival style. It is also a historical resource for purposes of CEQA. This portion of the parcel can be seen in Figures B-1 and B-2 in Appendix B. Elements of the Vineyard Inn Hotel that contribute to its historic significance include the following:

- Connected 14 lodging units and their Spanish Revival character-defining features;
- Combined manager’s/check-in office;
- Meeting/dining room;
- A concrete island, located between the manager’s office and the motel units, containing a lawn area and two mature date palms;
- Two additional mature date palms, one located on the western edge of the property, outside of the entrance gate into the motel property from SR 121 (Arnold Drive) and the other on the property’s northeast edge (Fremont Drive), outside the other gate; and
- A thick grove of tall eucalyptus trees forming a windbreak on the property’s eastern boundary, behind the motel units.

Noncontributing elements include contemporary hotel signage, the pool/spa, and walls constructed parallel to the units on either end of the complex, built for purposes of blocking headlight glare, which appear to be of more recent origin.

**Consultation**

On February 10, 2015, letters were sent to local historical societies requesting information on historic period resources within the project area of potential effects. The letters were sent to the Sonoma County Historical Society and Sonoma Valley Historical Society and included a brief project description and a request for information on the history of the project area. To date, no response has been received.
A search of the Sacred Lands File was conducted by the Native American Heritage Commission in February 2015. The search failed to indicate the presence of cultural resources in the immediate project area. Based on a list provided by the Native American Heritage Commission, letters were also sent to four tribal groups or individuals who may have knowledge of cultural resources in the area of potential effects or may have an interest in the project. Written and telephone responses were received from the Sacred Sites Protection Committee of The Federated Indians of Graton Rancheria. Table 2.1-14 summarizes the consultation to date.

Table 2.1-14: Summary of Consultation

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2.1.8.3 Environmental Consequences

Project-Level Impacts

Build Alternatives

The impacts of both build alternatives would be very similar to one another. No archaeological resources were identified within the accessible portions of the archaeological area of potential effects. Archaeological surveys will take place on the northeast parcel once access is available per the protocol outlined in the project’s Archaeology Phased Identification Plan (2016) and per Stipulation X.II.B of the Programmatic Agreement. Based on the survey work conducted on accessible parcels, a buried site sensitivity analysis, and the results of the archaeological
study, there is a very low likelihood of identifying new archaeological resources once access is granted to the unsurveyed parcel. However, in the event resources are identified during the additional survey, the *Phased Identification Plan* outlines specific steps to be taken to address newly identified resources in compliance with Section 106 and CEQA. The Division of Environmental Analysis reviewed and approved the use of a *Phased Identification Plan* for the project per Stipulation X.II.B of the Section 106 PA. The State Historic Preservation Officer subsequently concurred with the project’s finding of no historic properties affected for archaeological resources for either of the build alternatives. Additionally, nine built environment resources were identified, evaluated, and determined ineligible for inclusion in the National Register of Historic Places and are not considered historic properties/historical resources; therefore, none of these properties would be affected under CEQA or Section 106 as a result of the project.

As described above, only the northern triangular-shaped portion of the Vineyard Inn Hotel parcel is eligible for inclusion on the National Register of Historic Places, as shown in Figures B-1 and B-2 of Appendix B. This analysis only discusses potential impacts to this northern triangular-shaped portion, not impacts to the entire parcel. The existing free right turn in front of the hotel would be removed, which would result in a permanent physical acquisition of a sliver of the historic property under the Signalized Intersection Alternative (0.24 acre). There would be no permanent impacts under the Roundabout Alternative. A temporary construction easement would occur under both build alternatives (0.06 acre). The project would not result in removal of any of the motel building units or any other associated character-defining features of the historic property. No physical buildings or structures would be directly impacted. It is unlikely that the small sliver acquisition required under the Signalized Intersection Alternative would fundamentally affect the historic property to the point that its significance would be diminished.

Under the Signalized Intersection Alternative, one contributor to its historic significance, a single mature California date palm standing on the western edge of the property, located immediately south of the driveway leading from SR 121/Arnold Drive, would be impacted. Under a condition that will be imposed as part of the Secretary of the Interior’s Standards for the Treatment of Historic Properties Action Plan prepared for this property, the palm tree will be relocated a short distance away (fewer than 10 feet) to the southeast. None of the other three mature date palms associated with the historic property, and considered to be contributors, would be affected. These partial permanent acquisitions from the historic property would not directly physically impact any of the three historic motel buildings situated on the parcel. The date palms are considered contributing elements to the historic property but not major character-defining features associated with the property, as compared to the motel units, manager’s office, or building used for special events. While these changes would result in
minor permanent visual and setting changes in the area, the visual setting of the property was previously modified by earlier transportation improvements, including development of the existing Caltrans Park and Ride lot approximately 25 years ago.

The permanent acquisition and temporary construction easement of a portion of the historic property would not change the character of the property or physical features within the property’s setting that contributes to its historic significance. Under both build alternatives, access to the historic property would not be changed, and internal circulation within the historic motel courtyard parking area would be maintained; therefore, neither build alternative would adversely affect the Vineyard Inn Hotel.

A letter was sent to the State Historic Preservation Officer on February 11, 2016, to confirm the eligibility determinations of the Vineyard Inn Hotel and the eight other previously unevaluated properties in the area of potential effects. On March 21, 2016, the State Historic Preservation Officer concurred with the findings that the Vineyard Inn Hotel is eligible for the National Register of Historic Places under Criterion C at the local level of significance and that the nine additional properties evaluated are not eligible for the National Register of Historic Places. An additional letter was sent to the State Historic Preservation Officer on August 23, 2016, to request concurrence for a finding of No Adverse Effect without Standard Conditions on historic properties within the project’s area of potential effects. The State Historic Preservation Officer concurred on a Finding of No Adverse Effect for the Vineyard Inn Hotel in a letter dated September 29, 2016 (Appendix G). The State Historic Preservation Officer concurred on the Finding of No Adverse Effect for the overall project in the same letter.

Because the Vineyard Inn Hotel is eligible for inclusion in the National Register of Historic Places, it is also considered a Section 4(f) resource. A request for concurrence on a finding of the Section 4(f) de minimis determination was included in the August 23, 2016, letter to the State Historic Preservation Officer. There are no other historic properties that would be considered a Section 4(f) resource in the project vicinity. This is discussed in more detail in Appendix B, Section 4(f) De Minimis Determination.

**No Build Alternative**

The No Build Alternative would not affect cultural resources because no improvements would be implemented.

**Construction Impacts**

**Build Alternatives**

The impacts of both build alternatives would be very similar to one another. The existing Park and Ride lot would be relocated under the Roundabout Alternative to the northeast quadrant of the intersection. This quadrant was not surveyed due to access restrictions; therefore,
archaeological surveys will take place once access is available per the protocol outlined in the project’s *Archaeology Phased Identification Plan* (2016).

Archaeological surveys did not identify any cultural resources within the accessible portions of the archaeological area of potential effects. In addition, the buried sites analysis indicates that the archaeological area of potential effects includes soil types that predate prehistoric human occupation in the area; thus, there is a low potential for buried sites. If any prehistoric deposits are present, they would be found at or near the surface. Much of the project’s area of potential effects has been highly disturbed by road construction and maintenance, residential and commercial development, and agricultural activities, which would have disturbed surface or near surface archaeological sites; however, if intact archaeological sites are discovered during construction, measures will be implemented to avoid impacts (see PF and AMMs CUL-1 through -5).

A temporary construction easement (0.06 acre) would be required from the Vineyard Inn Hotel under both build alternatives. The temporary work on the property would include access onto the property to construct project-related features, including relocating utilities and constructing drainage and a new pedestrian facility between 6 and 10 feet in width. All existing private property owner walls and landscaping in the interior courtyard area and eastern property border would be unaffected. Impacts to the Vineyard Inn Hotel associated with the temporary construction easements would not be permanent because the parcel would be restored to conditions appropriate to the property. Adherence to the Secretary of the Interior’s Standards for the Treatment of Historic Properties Action Plan will be followed to ensure there are no impacts to the Vineyard Inn Hotel (see Finding of No Adverse Effect without Standard Conditions).

**No Build Alternative**

The No Build Alternative would not affect cultural resources during construction because there would be no ground-disturbing activities.

### 2.1.8.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures

The following project features and avoidance and minimization measures will be implemented under both build alternatives:

- **PF CUL-1**: Cultural resources will be avoided to the greatest extent practicable. Further investigations may be needed if the site[s] cannot be avoided by the project. As soon as feasible, additional surveys will be required for the portions of the archaeological area of potential effects that were not surveyed due to access restrictions per the project’s *Archaeology Phased Identification Plan* (2016).
• **AMM CUL-2:** The Secretary of the Interior’s Standards for the Treatment of Historic Properties Action Plan will be implemented during construction. It describes the actions to be taken to protect the Vineyard Inn Hotel during project construction.

• **AMM CUL-3:** The *Archaeology Phased Identification Plan* (2016) will be implemented for archaeological resources in the unsurveyed northeast parcel. It describes the additional identification efforts that will be taken prior to construction and efforts that will be made to avoid effects on any newly identified resources.

• **PF CUL-4:** If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

• **PF CUL-5:** If Caltrans Professionally Qualified Staff determines that cultural materials contain human remains, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains. Caltrans’ Cultural Resources Studies Office will contact the Sonoma County Coroner. Pursuant to CA PRC Section 5097.98, if the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission, which will then notify the Most Likely Descendent. Caltrans, District 4, Cultural Resources Studies Office will work with the Most Likely Descendent on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.
2.2 Physical Environment

2.2.1 Hydrology and Floodplains

2.2.1.1 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. Federal Highway Administration requirements for compliance are outlined in 23 CFR 650 Subpart A.

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 affected by the project.

The base floodplain is defined as “the area subject to flooding by the flood or tide having a 1 percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

2.2.1.2 Affected Environment

This section summarizes the Floodplain Encroachment Technical Memorandum (February 2016) prepared for this project. Sonoma Creek and Yellow Creek are the two receiving water bodies that cross SR 116 and/or SR 121 near the study area, shown below in Figure 2.2-1. Sonoma Creek is a natural, unlined channel and crosses SR 121 at approximately 0.65 mile east of the project intersection. Yellow Creek is unlined and channelized and crosses Bonneau Road at approximately 430 feet west of the project intersection and crosses SR 121 at approximately 960 feet south of the project intersection.

Natural and beneficial floodplain values include, but are not limited to, fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge. The Federal Emergency Management Agency Flood Insurance Rate Map (Map Number 06097C1030E; December 2, 2008) shows that the project is within Zone X (unshaded), which can be seen in Figure 2.2-1. This area represents areas of minimal flood hazard and is outside the limits of the 0.2-percent-annual-chance floodplain. The 0.2-percent-annual-chance flood means that there is a chance of 0.002 of a flood occurring in a given year. The Sonoma Creek and Yellow Creek crossings at SR 116, SR 121, and Bonneau Road are not within the study area.
area. There are also no identified 100-year floodplains within the project limits, as shown in Figure 2.2-1. The project limits are defined as the limits of the proposed improvements for the build alternatives.

Figure 2.2-1: Receiving Water Bodies and Federal Emergency Management Agency Flood Insurance Rate Map
2.2.1.3 Environmental Consequences

As a result of impervious and pervious surface mathematical calculation corrections made between circulation of the Draft Environmental Document and preparation of the Final Environmental Document, impacts to hydrology and floodplains have changed, as discussed in the analysis below.

Project-Level Impacts

Build Alternatives

The impacts of both build alternatives would be the same as one another. A significant encroachment is defined in 23 CFR 650.105 as a highway encroachment and any direct support of likely base floodplain development that would involve one or more of the following construction- or flood-related impacts: (1) significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community’s only evacuation route, (2) a significant risk to life or property with change in land use, fill inside the floodplain, or change in water surface elevation, or (3) a significant adverse impact on the natural and beneficial floodplain values.

The risk associated with the build alternatives is from the consequences associated with the probability of flooding due to encroachment into the base floodplain. The build alternatives are not located within the base floodplain; therefore, there would be no change in land use, and the risk to life or property associated with the build alternatives would be minimal. There would also be no fill inside the base floodplain as a result of the build alternatives. The Roundabout Alternative would result in a net increase of 1.03 acres of impervious surface (includes subtraction of relocated Park and Ride lot area [0.61 acre]), while the Signalized Intersection Alternative would result in a net increase of 1.53 acres of impervious surface. Compared to the Sonoma Creek watershed or Yellow Creek watershed in the vicinity of the study area, the added impervious area is approximately 0.005 and 0.49 percent of the Sonoma Creek and Yellow Creek watersheds, respectively. The added runoff is anticipated to be minimal; therefore, a risk for changes in the 100-year water surface elevation is not anticipated.

The build alternatives are located at an existing intersection and are not intended to encourage additional development in the project area; therefore; the build alternatives would not support incompatible floodplain development. In addition, because the project is not located within the base floodplain, there would be no impacts to natural and beneficial floodplain values and no significant encroachment or longitudinal encroachment to the base floodplain.

No Build Alternative

The No Build Alternative would have no impact on hydrology and floodplains.
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

Build Alternatives
There would be no construction impacts from the build alternatives because the project is not located within the base floodplain.

No Build Alternative
The No Build Alternative would have no impact on hydrology and floodplains.

2.2.1.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures
The build alternatives would not impact the existing floodplain nor affect any beneficial floodplain values; therefore, no project features, avoidance, minimization, and/or mitigation measures are required. Project features for the addition of impervious surface area are provided in Section 2.2.2.4.

2.2.2 Water Quality and Stormwater Runoff

2.2.2.1 Regulatory Setting

Federal Requirements: Clean Water Act
In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source\(^2\) unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System permit. This act and its amendments are known today as the Clean Water Act. Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of stormwater from municipal and industrial/construction point sources to comply with the National Pollutant Discharge Elimination System permit scheme. The following are important Clean Water Act sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the National Pollutant Discharge Elimination System, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. The Regional Water Quality Control Boards administer this permitting program in California. Section 402(p) requires permits for discharges of stormwater from industrial/construction and municipal separate storm sewer systems.

\(^2\) A point source is any discrete conveyance, such as a pipe or a man-made ditch.
Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers.

The goal of the Clean Water Act is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

The U.S. Army Corps of Engineers issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of the U.S. Army Corps of Engineers’ Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the U.S. Army Corps of Engineers’ decision to approve is based on compliance with U.S. Environmental Protection Agency’s Section 404 (b)(1) Guidelines (U.S. EPA CFR 40 Part 230) and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. Environmental Protection Agency in conjunction with the U.S. Army Corps of Engineers and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative that would have less adverse effects. The Guidelines state that the U.S. Army Corps of Engineers may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause “significant degradation” to waters of the U.S. In addition, every permit from the U.S. Army Corps of Engineers, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements (see 33 CFR 320.4). A discussion of the LEDPA determination, if any, for the document is included in Section 2.3.2, Wetlands and Other Waters.

3 The U.S. Environmental Protection Agency defines “effluent” as “wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall.”
State Requirements: Porter-Cologne Water Quality Control Act

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 gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the Clean Water Act and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of “waste” as defined, and this definition is broader than the Clean Water Act definition of “pollutant.” Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements and may be required even when the discharge is already permitted or exempt under the Clean Water Act.

The State Water Resources Control Board and Regional Water Quality Control Boards are responsible for establishing the water quality standards (objectives and beneficial uses) required by the Clean Water Act and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable Regional Water Quality Control Board Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect these uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the State Water Resources Control Board identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with Clean Water Act 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 or non-point source controls (National Pollutant Discharge Elimination System permits or Waste Discharge Requirements), the Clean Water Act requires the establishment of Total Maximum Daily Loads. Total maximum daily loads specify 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 State Water Resources Control Board administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, total maximum daily loads, and National Pollutant Discharge Elimination System permits. Regional Water Quality Control Boards are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.
National Pollutant Discharge Elimination System Program

Municipal Separate Storm Sewer Systems

Section 402(p) of the Clean Water Act requires the issuance of National Pollutant Discharge Elimination System permits for five categories of stormwater discharges, including Municipal Separate Storm Sewer Systems. A Municipal Separate Storm Sewer System is defined 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, county, or other public body having jurisdiction over stormwater, that is designed or used for collecting or conveying stormwater.” The State Water Resources Control Board has identified Caltrans as an owner/operator of a Municipal Separate Storm Sewer System under federal regulations. Caltrans’ Municipal Separate Storm Sewer System permit covers all Department ROWs, properties, facilities, and activities in the state. The State Water Resources Control Board or the Regional Water Quality Control Board issues National Pollutant Discharge Elimination System permits for 5 years, and permit requirements remain active until a new permit has been adopted.

Caltrans’ Municipal Separate Storm Sewer System Permit, Order No. 2012-0011-DWQ adopted on September 19, 2012, effective on July 1, 2013, as amended by Order No. 2014-0077-DWQ (effective July 1, 2014) and Order No. 2015-0036-EXEC (effective April 7, 2015) has three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (see below);
2. Caltrans must implement a year-round program in all parts of the State to effectively control stormwater and non-stormwater discharges; and
3. Caltrans stormwater discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices, to the Maximum Extent Practicable, and other measures as the State Water Resources Control Board determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the Statewide Stormwater Management Plan to address stormwater pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The Stormwater Management Plan assigns responsibilities within Caltrans for implementing stormwater management procedures and practices, as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The Stormwater Management Plan describes the minimum procedures and
practices Caltrans uses to reduce pollutants in stormwater and non-stormwater discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of Best Management Practices. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest Stormwater Management Plan to address stormwater runoff.

**Construction General Permit**

Construction General Permit Order No. 2009-0009-DWQ (adopted on September 2, 2009, and effective July 17, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective on July 17, 2012). The permit regulates stormwater discharges from construction sites that result in a disturbed soil area of 1 acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all stormwater discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least 1 acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than 1 acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the Regional Water Quality Control Board. Operators of regulated construction sites are required to develop stormwater pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The 2009 Construction General Permit separates projects into Risk Levels 1, 2, or 3. Levels are determined during the planning and design phases and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For all projects subject to the permit, applicants are required to develop and implement an effective Stormwater Pollution Prevention Plan. In accordance with Caltrans’ Standard Specifications, a Water Pollution Control Plan is necessary for projects with disturbed soil area less than 1 acre.

**Section 401 Permitting**

Under Section 401 of the Clean Water Act, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are Clean Water Act Section 404 permits issued by the U.S. Army Corps of Engineers. The 401 permit certifications are obtained from the appropriate Regional Water Quality Control Board, dependent on the project location, and are required before the U.S. Army Corps of Engineers issues a 404 permit.
In some cases, the Regional Water Quality Control Board may have specific concerns with discharges associated with a project. As a result, the Regional Water Quality Control Board may issue a set of requirements known as Waste Discharge Requirements under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. Waste Discharge Requirements can be issued to address both permanent and temporary discharges of a project.

2.2.2.2 Affected Environment

Surface Water

The following summarizes the findings of the Water Quality Assessment Report (August 2016) and the Stormwater Data Report (August 2016). The study area is within the Sonoma Creek watershed, which is approximately 170 square miles and includes all of Sonoma Valley. The project is entirely within an undefined hydrologic sub-area (Hydrologic Sub-Area #206.40) in the San Pablo Hydrologic Unit in the San Francisco Bay Hydrologic Region. The watershed area for the undefined hydrologic sub-area is 106,593 acres.

Surface drainage and drainage features within the study area are shown in Figure 2.2-2. There are six drainage crossings along SR 116 and SR 121 and one waterway, Yellow Creek, within the study area. Yellow Creek receives runoff directly from the site on Bonneau Road to the east and along SR 121 to the south of the project site. Sonoma Creek is an indirect receiving water of the project, 1.16 miles south of the project area along Yellow Creek. The San Francisco Bay Basin (Region 2) Water Quality Control Plan (2013) identifies beneficial uses for Sonoma Creek and its tributaries, including cold freshwater habitat, fish migration, preservation of rare and endangered species, fish spawning, warm freshwater habitat, wildlife habitat, commercial and sport fishing, contact water recreation, and noncontact water recreation. These beneficial uses are presumed to apply to Yellow Creek and to the unnamed ponds in the study area.

In general, runoff in the project vicinity is collected and conveyed along the shoulders of and under SR 121, SR 116, and Bonneau Road through various drainage ditches, underdrains, pipes, and culverts. The general drainage pattern west and south of the intersection is to convey flow into Yellow Creek, which crosses Bonneau Road and SR 121 en route to Sonoma Creek. Sonoma Creek drains to San Pablo Bay, located approximately 9 miles south of the project area. The general drainage pattern north and east of the intersection is to convey flow easterly and southeasterly into two small unnamed ponds south of SR 121 between Maffei Road and Sonoma Creek.
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Figure 2.2-2: Surface Drainage and Drainage Features
Groundwater
The project is located within the Napa-Sonoma Valley groundwater basin, Sonoma Valley sub-basin. Depth to groundwater across the project site footprint ranges between 10 and 20 feet below ground surface at elevations ranging from 5 to 15 feet above sea level. The Basin Plan includes the Sonoma Valley groundwater basin as having the existing beneficial uses of municipal and domestic water supply and agricultural water supply and the potential beneficial uses of industrial process and service water supply; however, the Caltrans District 4 Work Plan (2013b), which describes how Caltrans plans to implement stormwater requirements in local projects, does not identify any drinking water reservoir or recharge facilities within the vicinity of the project site in Sonoma County.

Groundwater contamination has been reported within the study area due to two leaking underground storage tanks. These sites are undergoing cleanup and are discussed in more detail in Section 2.2.5, Hazardous Waste/Materials.

Existing Water Quality
Commonly found pollutants in roadway runoff are total suspended solids, nitrate nitrogen, nitrogen, phosphorous, orthophosphate, copper, lead, and zinc. Some sources of these pollutants are natural erosion, phosphorus from tree leaves, combustion products from fossil fuels, and the wearing of brake pads and tires.

Sonoma Creek is listed as a Category 5 impaired water body in the 2012 Integrated Report by pollutants such as nutrients, pathogens, and sedimentation/siltation from construction, land development, and urban runoff/storm sewers (State Water Resources Control Board, 2012). A water body is assigned Category 1-5 based on beneficial uses and pollutant concentrations. A Category 5 water body is a water segment where Clean Water Act standards are not being met and a Total Maximum Daily Load is required but not yet completed for at least one of the pollutants being listed for the segment. Regional Water Quality Control Board staff recently determined that the nontidal portions of Sonoma Creek are not impaired by nutrients; therefore, they should be “delisted” or removed from this list. The project site discharges indirectly to a non-tidal portion of Sonoma Creek.

2.2.2.3 Environmental Consequences
As a result of impervious and pervious surface mathematical calculation corrections made between circulation of the Draft Environmental Document and preparation of the Final Environmental Document, impacts to water quality and stormwater runoff have changed, as discussed in the analysis below.
**Project-Level Impacts**

**Build Alternatives**

The impacts of both build alternatives would be very similar to one another. Both build alternatives would preserve existing surface drainage at each offsite discharge location, located outside the study area farther north, south, or east along the intersection legs. Modifications to existing drainage features and new drainage improvements would be required to collect and convey the additional runoff generated by the proposed widening in both the Roundabout Alternative and the Signalized Intersection Alternative. As shown in Table 2.2-1, the Roundabout Alternative would result in a net increase of 1.03 acres of impervious surface (includes subtraction of Park and Ride lot area [0.61 acre]), while the Signalized Intersection Alternative would result in a net increase of 1.53 acres of impervious surface. The increase in runoff due to the additional impervious surface area has the potential to impact downstream erosion and water quality. It could also result in the direct discharge of sediment-laden flow from the highway into receiving water bodies. This potential increase in runoff would need to be detained in a designed hydromodification system to mimic the existing drainage patterns or conditions. Hydromodification is the alteration of the natural flow of water through a landscape and often takes the form of channel modification or channelization.

Both build alternatives could also potentially result in increased deposition of pollutants resulting from increased traffic volumes throughout the corridor. The project would not impact groundwater recharge in the project vicinity due to the relatively small area of new impervious surface relative to the size of the regional watershed groundwater basin.

**No Build Alternative**

The No Build Alternative may have potential permanent water quality impacts due to increasing congestion, leading to a greater deposition of particulates from exhaust and heavy metals from braking.

**Construction Impacts**

**Build Alternatives**

The impacts of both build alternatives would be very similar to one another. There would be no direct impacts to Yellow Creek or Sonoma Creek during construction of either build alternative because no construction activities are proposed within or adjacent to either creek. During construction, sediment-laden flow can result from runoff over disturbed soil areas and enter storm drainage facilities or directly discharge into Yellow Creek, increasing the turbidity and decreasing the clarity and beneficial uses of the receiving water body. As shown in Table 2.2-1, the total disturbed soil area would be 9.36 acres for the Roundabout Alternative and 9.09 acres for the Signalized Intersection Alternative. Additional sources of sediment that could result in increases in turbidity include uncovered or improperly covered active and nonactive
stockpiles and construction staging areas, and construction equipment not properly maintained or cleaned. Temporary drainage facilities may be required to redirect runoff from work areas. These would include runoff detainment devices placed at storm drain inlets that would catch runoff from construction activities.

**Table 2.2-1: Net Impervious Surface and Disturbed Soil Area**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Net Added Impervious Surface (acres)</th>
<th>Disturbed Soil Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundabout Alternative</td>
<td>1.03</td>
<td>9.36</td>
</tr>
<tr>
<td>Signalized Intersection Alternative</td>
<td>1.53</td>
<td>9.09</td>
</tr>
<tr>
<td>No Build Alternative</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>


**No Build Alternative**
The No Build Alternative would not affect water quality or stormwater runoff.

### 2.2.2.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures

Both build alternative footprints overlap potential waters of the U.S. or waters of the State; therefore, a 404 permit from the U.S. Army Corps of Engineers and a 401 Water Quality Certification from the San Francisco Bay Regional Water Quality Control Board are required for the proposed project. Because a Section 404 Permit is required, the Caltrans District Biologist must document that the following sequence of project features and avoidance and minimization measures have been followed.

Impacts to surface water and groundwater as a result of stormwater runoff will be avoided or minimized through implementation of design features, or best management practices, which will be developed and incorporated into the project design and operations prior to commencement of construction. A risk assessment performed in accordance with the Construction General Permit determined the project risk level, which is based on potential erosion and transport to receiving waters, described in Section 2.2.2.1, Regulatory Setting. The project has a medium sediment risk and a high receiving water risk, resulting in a Risk Level 2 classification; therefore, stormwater sampling will be required at all discharge locations for the build alternatives. The following project features will be implemented for both build alternatives:

- **PF WQ-1:** Stormwater sampling will be required at all discharge locations during construction.
- **PF WQ-2:** A Notice of Intent will be filed with the State Water Resources Control Board’s Stormwater Multiple Application and Report Tracking System. A Stormwater Pollution Prevention Plan will also need to be implemented to address the temporary water quality impacts resulting from construction activities.

- **PF WQ-3:** Environmentally sensitive areas will be delineated on project plans and will be avoided during construction.

- **PF WQ-4:** Treatment best management practices will be incorporated into the project and are permanent devices and facilities that treat stormwater runoff. Caltrans has an approved list of treatment best management practices that have been studied and verified to remove targeted design constituents and provide general pollutant removal. Local county guidance will also be followed. The project will include stormwater runoff treatment measures designed not only to treat stormwater, but also to provide hydromodification to offset the increase in volume and rate of discharge created by the project. Preliminary evaluation of data on surface and subsoil texture, structure, and composition, as well as groundwater depth, indicates no real limits to the range of hydromodification options available to the project.

- **PF WQ-5:** Best management practices will be incorporated into the contract documents of the project to reduce the discharge of pollutants temporarily, during construction, and permanently to the maximum extent practicable. Construction site best management practices will be implemented during construction activities to reduce pollutants in stormwater discharges throughout construction. These include the measures of soil stabilization, sediment control, tracking control, non-stormwater management, waste management/materials pollution control and jobsite management.

- **PF WQ-6:** Design pollution prevention best management practices are permanent measures to improve stormwater quality by reducing erosion, stabilizing disturbed soil areas, and maximizing vegetated surfaces. The following design pollution prevention best management practices will be incorporated into the project design:
  - Conserve natural areas, to the extent feasible, including existing trees, vegetation, and soils;
  - Install concentrated flow conveyance systems, such as ditches, berms, swales, flared end sections, outlet protection, and velocity dissipation devices to protect drainages.
  - Minimize the impervious footprint of the project;
  - Minimize disturbances to natural drainages;
  - Design and construct pervious areas to effectively receive runoff from impervious areas, taking into consideration the pervious area’s soil conditions, slope, and other pertinent factors;
  - Implement landscape and soil-based best management practices, such as compost-amended soils and vegetated strips and swales;
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

- Use locally appropriate landscaping that minimizes irrigation and runoff, promotes surface infiltration, and minimizes the use of pesticides and fertilizers; and
- Design all landscapes to comply with the California Department of Water Resources Water Efficient Landscape Ordinance.

Thus, no avoidance, minimization, or mitigation measures are required with implementation of the above project features.

2.2.3 Geology/Soils/Seismic/Topography

2.2.3.1 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. Caltrans Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. Structures are designed using Caltrans Seismic Design Criteria. The Seismic Design Criteria provides the minimum seismic requirements for highway bridges designed in California. A bridge’s category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see Caltrans’ Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

2.2.3.2 Affected Environment

This section summarizes the Preliminary Geotechnical Report (August 2015). The study area is located in the Sears Point U.S. Geological Survey quadrangle in the Sonoma Valley. The area has a relatively flat landscape, ranging from 20 feet elevation in the northwest quadrant to 15 feet elevation in the southeast quadrant. Sonoma Valley is a narrow valley filled with alluvium and terrace deposits, bordered by two mountain ranges on the east and west sides. The study area is underlain by alluvial deposits of sand, silt, and gravel deposited in fan, valley fill, terrace, or basin environments of Holocene and late Pleistocene age (approximately 12,000 years old). The western and extreme northern portions of the study area are underlain by alluvial fan deposits consisting of moderately to poorly sorted and moderately to poorly bedded sand, gravel, silt, and clay deposited where streams emanate from upland regions onto more gently sloping valley floors or plains. Quaternary alluvial deposits, as well as the Glen Ellen formation, Huichica formation, and Sonoma volcanic, are known to be the main water-bearing geologic units in the area. Groundwater depths ranged from 4 to 23 feet below ground surface between July 30 and August 1, 2008. Figure 2.2-3 shows the soil types in the study area.
Figure 2.2-3: Soil Types in the Study Area
Soil in the study area is primarily Haire clay loam. This soil unit is located on uplands and uplifted terraces, and it consists of alluvium derived from sedimentary rocks. The shrink-swell potential of this soil unit is moderate. The natural drainage class is moderately well-drained, and surface runoff is high. A portion of the southern extent of the study area along SR 121 near the Yellow Creek Bridge is underlain by Zamora silty clay loam. Zamora silty clay loam is located on alluvial fans in river valleys, and it consists of alluvium derived from sedimentary rocks. The shrink-swell potential of this soil unit is moderate. This soil unit is well-drained, and surface runoff is medium.

The study area is located in the seismically active San Francisco Bay area, which has experienced many severe earthquakes in recent history. The nearest fault to the study area is the Rodgers Creek fault zone, which is located approximately 2.4 miles to the west of the study area in the Sonoma Mountains. The Browns Valley section of the West Napa fault zone is the second closest fault to the study area, located approximately 8.3 miles to the east. Lastly, the study area is approximately 22.5 miles east of the San Andreas fault zone. The study area is not within an Alquist-Priolo earthquake fault zone.

Susceptibility to liquefaction in the study area is very low; the risk increases nearer to Sonoma Creek, where susceptibility to liquefaction is rated as high to very high. In addition, due to relatively flat topography, seismically induced landslides, rockfall, or debris flows are not potential hazards affecting the study area.

### Project-Level Impacts

**Build Alternatives**

The impacts of both build alternatives would be the same as one another. During operation of the build alternatives, impacts on users of the intersection could result from seismic hazards. Both the San Andreas and Rodgers Creek faults have potential to create seismic hazards within the study area. The highest magnitude earthquakes to be expected for these faults are 8.0 for the San Andreas Fault and 7.3 for the Rodgers Creek Fault. The largest hypothetical earthquake that could affect the study area would come from the Rodgers Creek Fault, resulting in strong ground shaking (0.650 g) during a seismic event. As described above, the risk of secondary seismic hazards to affect users of the intersection (i.e., liquefaction, seismically induced landslides, rock falls, settlement, and subsidence) is low within the study area due to existing soil conditions and topography. Additionally, operation of the build alternatives would not impact geology or soils.
**No Build Alternative**
The No Build Alternative would have the same potential impacts as described for the build alternatives.

**Construction Impacts**

**Build Alternatives**
The impacts of both build alternatives would be the same as one another. Construction of the build alternatives would require excavations between 5 and 13 feet. Shallow excavations (i.e., less than 5 feet) for highway or parking lot construction are unlikely to encroach into the groundwater table; however, excavations of up to 13 feet for utility pole foundations could encroach into the shallow groundwater aquifer during construction. In addition, construction could expose workers to seismic hazards, such as earthquakes. Measures would be included in the project to provide for construction worker safety.

Project construction for both build alternatives is unlikely to result in extensive soil erosion of the surrounding area because the study area is situated in relatively flat terrain. The geology of the area would not be impacted by construction activities.

**No Build Alternative**
The No Build Alternative would have the same potential impacts as described for the build alternatives.

2.2.3.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures

The following project features will be implemented for both build alternatives:

- **PF GEO-1**: To minimize potential impacts from seismic events, the project will be constructed in accordance with all applicable Caltrans standards and regulations, and will be designed for the maximum possible earthquake. All construction activities will adhere to current engineering practices and recommendations provided by a Geotechnical Engineer/Engineering Geologist.

- **PF GEO-2**: In the event that groundwater is encountered in excavations during construction, groundwater could be managed with typical pumping operations to maintain a dry work area. If groundwater pumping is necessary within an excavation, groundwater will be collected in low points (called sumps). These low points will be equipped with a sump pump, and the water will be pumped out of the excavation. Groundwater shall be pumped into storage tanks, and either treated, disposed, or discharged based on groundwater testing results. If groundwater pumping is required, a Section 402 Caltrans National Pollutant Discharge Elimination System Permit will be obtained from the State Water Resources Control Board.
• **PF GEO-3**: To minimize the potential for soil instability from shrink-swell potential, soils with shrink-swell potential shall be compacted at the highest moisture content possible and not be allowed to dry out prior to covering with other material.

• **PF GEO-4**: A geotechnical investigation is necessary to determine the engineering characteristics of native soil in undeveloped areas. Special treatments could be required to increase the suitability of native soils for highway construction, or excavated material from obliterated highway embankments (e.g., intersection bypass lane on northbound SR 121) may be used. Otherwise, imported soil may be required. Imported soil for highway embankments shall have a minimum R-value (measure of thermal resistance/insulation) of 15 and shall have the appropriate environmental certifications to ensure contaminated soil is not used onsite.

### 2.2.4 Paleontology

#### 2.2.4.1 Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils.

A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects.

16 U.S.C. 461-467 (the National Registry of Natural Landmarks) establishes the National Natural Landmarks program. Under this program, property owners agree to protect biological and geological resources such as paleontological features. Federal agencies and their agents must consider the existence and location of designated National Natural Landmarks, and of areas found to meet the criteria for national significance, in assessing the effects of their activities on the environment under NEPA.

16 U.S.C. 470aaa (the Paleontological Resources Preservation Act) prohibits the excavation, removal, or damage of any paleontological resources located on federal land under the jurisdiction of the Secretaries of the Interior or Agriculture without first obtaining an appropriate permit. The statute establishes criminal and civil penalties for fossil theft and vandalism on federal lands.

23 U.S.C. 1.9(a) requires that the use of federal-aid funds must be in conformity with federal and state law.

Under California law, paleontological resources are protected by CEQA.

### 2.2.4.2 Affected Environment

This section summarizes the *Paleontological Identification/Evaluation Report* (March 2016). The project site is underlain by alluvial fan deposits of Pleistocene age (Qof, approximately 1.8 million to 12,000 years old) and alluvial fan deposits of Holocene age (Qhf, less than 12,000 years old); these deposits can be seen in Figure 2.2-4. The Huichica formation underlies these Holocene and Pleistocene alluvial fan deposits. The Huichica formation consists of massive yellow siltstone, well-sorted quartz-lithic sandstone, and poorly consolidated gravel and is of early Pleistocene to Pliocene age (approximately 3 million years old).

Paleontological records searches determined that there are no known Pleistocene-age fossils within the project site or a 1-mile radius of the project. The nearest known fossils are located near Petaluma in Petaluma formation geology and are approximately 5 million years old. The literature search indicates that, except for Holocene deposits (on the surface), all deposits within the study area have been known to contain significant nonrenewable paleontological resources in the San Francisco Bay region, and fossils near to the study area are located within bedrock units 2.3 million years and older. These deposits include Pleistocene-aged flora and fauna, including fossils of mammoths, fresh water mollusks, and invertebrates.

Assessments of paleontological sensitivity (i.e., potential to contain scientifically important paleontological resources) follow standard Caltrans criteria. The Caltrans criteria identify three categories to describe the likelihood that a geologic unit contains significant fossil materials: high potential, low potential, and no potential, as indicated in Table 2.2-2. Pleistocene deposits are assigned a high paleontological sensitivity rating.
Figure 2.2-4: Geologic Map of the Study Area
Table 2.2-2: Paleontological Sensitivity

<table>
<thead>
<tr>
<th>Caltrans Sensitivity Designation</th>
<th>Characteristics of Geologic Units in this Category</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Potential</strong> <em>(High Sensitivity)</em></td>
<td>This category consists of rock units known to contain significant vertebrate, invertebrate, or plant fossils anywhere within their geographic extent, including sedimentary rock units that are suitable for the preservation of fossils, as well as some volcanic and low-grade metamorphic rock units. This category includes rock units with the potential to contain:</td>
</tr>
</tbody>
</table>
|  - Pleistocene deposits – Qof | • Abundant vertebrate fossils;  
• A few significant vertebrate, invertebrate, or plant fossils that may provide new and significant taxonomic, phylogenetic, ecological, and/or stratigraphic data;  
• Areas that may contain datable organic remains older than Recent;  
• Areas that may contain unique new vertebrate deposits, traces, and/or trackways; and  
• Fossiliferous deposits with very limited geographic extent or an uncommon origin (e.g., tar pits and cave deposits). |
| **Low Potential** *(Low Sensitivity)* | This category includes sedimentary rock units that: |
|  - No units within the project are considered to be Low Potential | • Are potentially fossiliferous, but have not yielded significant fossils in the past;  
• Have not yet yielded fossils, but have the potential to contain fossil remains; or  
• Contain common and/or widespread invertebrate fossils of species whose taxonomy, phylogeny, and ecology are well understood. |
| **No Potential** *(No Sensitivity)* | This category includes rock units of intrusive igneous origin, most extrusive igneous rocks, and moderate- to high-grade metamorphic rocks. |


2.2.4.3 Environmental Consequences

*Project-Level Impacts*

**Build Alternatives**

There would be no project-level impacts to paleontological resources during operation of either build alternative because excavation is not expected to occur. Impacts could occur during the construction phase of the project, such as the permanent destruction of paleontological resources, and these impacts are discussed in the Construction Impacts section below.

**No Build Alternative**

The No Build Alternative would have no impact on paleontological resources.
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

Build Alternatives

The impacts of both build alternatives would be the same as one another. Pleistocene alluvium is the only paleontologically sensitive deposit within the study area that may be affected by project activities. Ground-disturbing activities for both build alternatives would impact native material up to 3 feet below ground surface within the study area, with some locations requiring excavations up to 13 feet for utility poles and storm drain systems. Earthwork to these depths would impact sensitive geological deposits (i.e., Pleistocene alluvium), but it is unlikely to affect significant paleontological resources due to historical and current land uses and associated activities.

No Build Alternative

The No Build Alternative would not impact paleontological resources because no ground-disturbing activities would occur.

2.2.4.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures

The project includes avoidance and minimization measures for impacts to paleontological resources, as described below. These avoidance and minimization measures are required to reduce the potential for construction activities to harm or impact paleontological resources that could be discovered during construction.

- AMM PAL-1: A project-specific Paleontological Mitigation Plan will be prepared by a qualified principal paleontologist (as defined in the Caltrans Standard Environmental Reference) during the design phase once adequate project design information regarding subsurface disturbance location, depth, and lateral extent is available.
- AMM PAL-2: The qualified principal paleontologist will be present at preconstruction meetings to confer with contractors who will be performing ground-disturbing activities.
- AMM PAL-3: The qualified principal paleontologist will conduct a preconstruction training to inform construction personnel on the types of material and fossils that may be encountered in sensitive geologic formations.
- AMM PAL-4: Paleontological monitors, under the direction of the qualified principal paleontologist, will be onsite to inspect cuts for fossils at all times during original ground disturbance involving sensitive geologic formations.
- AMM PAL-5: When fossils are discovered, the paleontologist (or paleontological monitor) will recover them. Construction work in these areas may be halted or diverted by the Resident Engineer to allow the prompt recovery of fossils.
- AMM PAL-6: Fossils collected during the monitoring and salvage portion of the mitigation program will be prepared to the point of identification, sorted, and cataloged.
• **AMM PAL-7**: Prepared fossils, along with copies of all pertinent field notes, photos, and maps, will be deposited in a scientific institution with paleontological collections.

• **AMM PAL-8**: A Paleontological Mitigation Report will be completed that outlines the results of the mitigation program.

A preliminary cost estimate has been prepared for implementing these avoidance and minimization measures per alternative. The cost estimate for the Roundabout Alternative is approximately $60,000, while the cost estimate for the Signalized Intersection Alternative is approximately $65,000.

### 2.2.5 Hazardous Waste/Materials

#### 2.2.5.1 Regulatory Setting

Hazardous materials, including hazardous substances and wastes, are regulated by many state and federal laws. Statutes govern the generation, treatment, storage, and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health, and land use.

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

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

In addition to the acts listed above, Executive Order 12088, *Federal Compliance with Pollution Control Standards*, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.
California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement the Resource Conservation and Recovery Act in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires cleanup of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and cleanup contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

### 2.2.5.2 Affected Environment

The information in this section is from the *Initial Site Assessment* (November 2015) prepared for the project. The *Initial Site Assessment* includes a review of federal, state, and local regulatory records for reports of hazardous waste, as well as a visual inspection of the project site from publicly accessible sidewalks and streets to check for evidence of potential environmental concerns such as debris piles, leaks or stains, monitoring wells or evidence of ongoing environmental work, chemical storage, poor housekeeping, active underground storage tanks, aboveground storage tanks, or dry cleaners with onsite storage of solvents.

Adjacent land uses include agriculture (i.e., vineyard and pasture), automotive services and gas station, a Park and Ride lot, commercial (i.e., deli, motel, retail, and wine tasting), and residential. The study area could contain lead contamination in the soil from motor vehicle exhaust, asbestos-containing materials in structures, and groundwater contamination. Historical pesticide usage is a potential source of environmental contamination on agricultural lands where there has been intense cropping (e.g., orchards or row crops). Most agricultural lands within the study area do not appear to have been historically used for these purposes. The land appears to have been pasture with some relatively recent conversions to vineyards.

The study area, shown in Figure 2.2-5, contains three sites with confirmed historical releases of hazardous materials: Bonneau’s Shell, Vineyard Inn Hotel, and Spanier Property, (2015). These three sites were also identified as facilities that use hazardous materials or generate hazardous waste.
Figure 2.2-5: Location of Sites with Confirmed Historical Releases of Hazardous Materials
Bonneau’s Shell is associated with multiple current and historic automotive service businesses in addition to Bonneau’s Shell gas station. Regulatory records indicate that the facility is an active groundwater remediation site due to a past leak of fuel from an underground storage tank. The primary hazardous materials of concern in groundwater are petroleum hydrocarbons, including gasoline and benzene. According to records reviewed at the time of the Initial Site Assessment, the owner plans to conduct an additional sulfate injection procedure to further reduce petroleum hydrocarbon concentrations in the groundwater.

Spanier Property is occupied by Big Toy Storage. In three monitoring wells onsite, groundwater sample results from 2006 indicate that chlorinated solvents above drinking water standards are present in the groundwater. According to records reviewed at the time of the Initial Site Assessment, the site is inactive, but it is subject to regulatory action and oversight if development is planned.

The Vineyard Inn Hotel formerly contained three underground fuel storage tanks. At least one of the tanks had leaked and released petroleum hydrocarbons into soil and groundwater. The leaking tank was located approximately 50 feet from the highway in front of the Inn’s office and conference building where the free right turn begins on SR 121/Arnold Drive. The tanks were removed in 2000 and 2001, and an ozone sparging system\(^4\) was installed at the site in 2009 and operated for approximately 18 months. Reportedly, the treatment system significantly reduced the hydrocarbon mass in groundwater. This case was closed by the oversight agency in 2012 because it concurred that the level of remaining contamination posed no significant risk to human health or the environment.

These locations, along with the entire study area, will be further investigated during the design phase of the project to determine the extent of hazardous materials present. Property owners will be contacted if required. Depending on the nature and extent of contamination observed, if any, the California Environmental Protection Agency, Department of Toxic Substances Control, State Water Resources Control Board, and/or Sonoma County Department of Health Services may need to be notified and become involved.

2.2.5.3 Environmental Consequences

Project-Level Impacts

Build Alternatives

The impacts of both build alternatives would be the same as one another. During operation of the build alternatives, the potential for encountering hazardous materials and waste would be

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\(^4\) Ozone Sparging System remediates organic matter in groundwater. The ozone-sparging process involves the injection of air-encapsulated ozone into groundwater to provide onsite treatment. The sparging apparatus is designed to produce “micro-bubbles” sized at 0.002 inch. This small air bubble size provides a high surface area to volume ratio to maximize treatment efficiency.
low. If remediation activities at Bonneau’s Shell and Spanier Property are not completed by the time the project is constructed, there is potential for an accidental release of hazardous waste and/or hazardous materials to occur. The implementation of avoidance, minimization, and/or mitigation measures identified in Section 2.2.5.4 would reduce this impact.

**No Build Alternative**
The No Build Alternative would have no impact on hazardous waste or materials because ground-disturbing activities would not occur.

**Construction Impacts**

**Build Alternatives**
The impacts of both build alternatives would be the same as one another. Impacts from lead contamination in the soil could occur where construction or maintenance of the highway involves disturbing or exposing surface soils adjacent to the existing highway. Direct contact with contaminated soil and subsequent hand-to-mouth activities (e.g., smoking, drinking, or eating) could result in the inadvertent ingestion of contaminated soil. Construction or maintenance activities could produce dust, which could expose workers or nearby residents and business occupants to lead via inhalation.

Project activities in the vicinity of Bonneau’s Shell and Spanier Property could expose construction crews to groundwater contamination due to subsurface activities that would encounter groundwater or make contact with soils. Bonneau’s Shell appears to be nearing completion of remediation activities and may be remediated and closed by the time the project tentatively begins construction in 2019. The extent and nature of the contamination at Spanier Property is not well described in available regulatory documents.

Bonneau’s Shell in the southwest quadrant of the SR 116/121 intersection is paved, and the soil surface is not visible. Because a gas station has been present at this location since the 1920s and the site may not have been paved throughout its history, historical releases of materials associated with automotive repairs, fueling of vehicles, and other vehicle maintenance activities may be present beneath the paved surface. Project activities would require the removal of pavement and the disturbance of underlying soil on this site, and impacts could occur from exposure to hazardous materials below the paved surface.

Unreported releases or spills at businesses that use or store hazardous materials are also sources of environmental contamination. With the exception of the commercial area in the southwest quadrant of the SR 116/121 intersection, however, the area of direct impact does not intrude substantially beyond the property boundaries of the businesses that adjoin the highways. No significant staining, debris piles, drums, or other evidence of environmental releases were observed along the frontages of commercial businesses within the area of direct impact during
the visual survey. Based on the lack of visual evidence of environmental releases in these areas and the limited intrusion of the build alternatives into these properties, impacts are not expected to occur from unreported releases or spills.

The potential for environmental contamination from pesticide usage in agricultural lands is possible but low because the land appears to have been pasture with some relatively recent conversions to vineyards. The property occupied by the Anaba tasting room was formerly a residence with a small orchard that was present from at least the 1940s until 1998 based on the available aerial photographs for the study area. In addition, the field at 800 Arnold Drive, while currently fallow and undeveloped, may have been used as agricultural land in the past. Project activities would require disturbance and handling of soils on these properties; therefore, pesticide contamination could be encountered during construction.

A previous Caltrans report analyzed hazardous materials within the existing Park and Ride lot (Caltrans, 2009). The primary objective of the investigation was to evaluate whether impacts due to metals, total petroleum hydrocarbons (e.g., gasoline, diesel, and motor oil), or volatile organic compounds are present in soil and groundwater at the Park and Ride lot. Tables 2.2-3 and 2.2-4 present the information from this study. Based on the metals, chromium, and lead concentrations, soil excavated from the Park and Ride lot was not considered a hazardous waste; however, diesel and motor oil concentrations exceeded their respective standards, which means offsite disposal of soil may be restricted. Groundwater at the Park and Ride lot was determined to have elevated levels of diesel and motor oil, which indicates contaminated groundwater at the Park and Ride lot.
### Table 2.2-3: Summary of Organics Results – Soil

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Sample Depth (ft)</th>
<th>Gasoline (mg/kg)</th>
<th>Diesel (mg/kg)</th>
<th>Motor Oil (mg/kg)</th>
<th>BTEX (µg/kg)</th>
<th>MTBE (µg/kg)</th>
<th>VOCs (µg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH1-0</td>
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<td>--</td>
<td>110</td>
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<td>--</td>
<td>--</td>
<td>--</td>
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<td>&lt;5.0</td>
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<td>ND</td>
<td>&lt;5.0</td>
<td>1,2,4-Trimethylbenzene=9.7</td>
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<td>&lt;1.0</td>
<td>ND</td>
<td>&lt;5.0</td>
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<td>BH4-0</td>
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<td>15</td>
<td>55</td>
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</tr>
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<td>BH4-3</td>
<td>3</td>
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<td>&lt;1.0</td>
<td>ND</td>
<td>&lt;5.0</td>
<td>ND</td>
</tr>
</tbody>
</table>

Environmental Screening Levels
Shallow Soils
- Residential: 83 (mg/kg), 83 (mg/kg), 370 (µg/kg), --, 23 (µg/kg), --
- Commercial/Industrial: 83 (mg/kg), 83 (mg/kg), 2,500 (µg/kg), --, 23 (µg/kg), --

Notes:
- mg/kg = milligrams per kilogram
- µg/kg = micrograms per kilogram
- BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
- MTBE = Methyl-tert-butyl ether
- ND = Not Detected above laboratory reporting limit
- -- = Not Analyzed or Not Applicable

Source: Caltrans, 2009.
## Table 2.2-4: Summary of Organics Results – Groundwater

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Gasoline (mg/L)</th>
<th>Diesel (mg/L)</th>
<th>Motor Oil (mg/L)</th>
<th>BTEX (µg/L)</th>
<th>MTBE (µg/L)</th>
<th>VOCs (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH2-GW</td>
<td>&lt;0.050</td>
<td>0.130</td>
<td>0.150</td>
<td>ND</td>
<td>&lt;5.000</td>
<td>Naphthalene=0.72</td>
</tr>
<tr>
<td>BH4-GW</td>
<td>&lt;0.050</td>
<td>0.086</td>
<td>0.100</td>
<td>ND</td>
<td>&lt;5.000</td>
<td>ND</td>
</tr>
</tbody>
</table>

**WQOs**
- Municipal Supply: -- -- -- -- 5.0 --

**California MCLs**
- Primary Standards: -- -- -- -- 13 --

**ESLs**
- GW IS Current/Potential Source of Drinking Water: 0.1 0.1 0.1 -- 5 Naphthalene=17
- Surface Water Bodies
  - Freshwater: 0.1 0.1 0.1 -- 5 Naphthalene=17
  - Marine/Estuarine: 0.21 0.21 0.21 -- 180 Naphthalene=21

**Notes:**
- mg/L = milligrams per liter
- µg/L = micrograms per liter
- BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
- MTBE = Methyl-tert-butyl ether
- ND = Not Detected above laboratory reporting limit
- --- = Not Analyzed or Not Applicable
- < = Not detected above the stated laboratory reporting limit
- MCL = Maximum containment level
- WQOs = water quality objectives

*Source: Caltrans, 2009.*

Encountering hazardous materials during construction could also impact the project’s scope, schedule, and cost for each build alternative. It could expand the project’s scope, add significant cost to the project, and cause delays to the schedule. This is further discussed in Section 2.2.5.4, Project Features, Avoidance, Minimization, and/or Mitigation Measures.

A preliminary site investigation will be conducted during the design phase to gain further information on the location and extent of hazardous materials. Postponing this investigation until the design phase will allow the preferred alternative to be 100 percent designed, which will increase the accuracy of testing for hazardous materials.

Aerially Deposited Lead from the historical use of leaded gasoline, exists along roadways throughout California. There is the likely presence of soils with elevated concentrations of lead as a result of Aerially Deposited Lead on the state highway system ROW within the limits of the project alternatives. Soil determined to contain lead concentrations exceeding stipulated...
thresholds must be managed under the July 1, 2016, Aerially Deposited Lead Agreement between Caltrans and the California Department of Toxic Substances Control. This Aerially Deposited Lead Agreement allows such soils to be safely reused within the project limits as long as all requirements of the Aerially Deposited Lead Agreement are met.

No Build Alternative

The No Build Alternative would have no impact on hazardous waste or materials because ground-disturbing activities would not occur.

2.2.5.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures

The following project features and avoidance and minimization measures are recommended to address the potential to encounter hazardous waste during construction:

- **PF HAZ-1:** A preliminary site investigation will be conducted by Caltrans during the design phase of the project and will include the collection and analysis of soil samples for lead in areas near the roadway or painted structures where surface soil will be disturbed. Areas of particular focus should include swales, ditches, and other low areas where runoff may have carried lead-contaminated particles from either aerially deposited vehicle emissions or the weathering of painted structures. Soil samples will also be collected and analyzed for petroleum hydrocarbons, pesticides, and arsenic (near the Anaba tasting room).

- **AMM HAZ-2:** At Bonneau’s Shell and Spanier Property, if groundwater is encountered, Caltrans will contact the responsible agencies for the sites as part of the preliminary site investigation, which is conducted during the design phase of the project. This will determine the site’s current status and whether intrusive investigation, such as the collection of groundwater or soil samples, is warranted at that time.

- **PF HAZ-3:** If soil, groundwater, or other environmental medium with suspected contamination is encountered unexpectedly during construction activities (e.g., identified by odor or visual staining, or if any underground storage tanks, abandoned drums, or other hazardous materials or wastes are encountered), work shall cease in the vicinity of the suspect material, the area shall be secured as necessary, and Caltrans shall take all appropriate measures to protect human health and the environment. Appropriate measures shall include notification of regulatory agency(ies), such as the California Environmental Protection Agency, Department of Toxic Substances Control, State Water Resources Control Board, and/or Sonoma County Department of Health Services, and compliance with the various regulatory agencies’ laws, regulations, and policies.

- **PF HAZ-4:** Caltrans and the contractor shall stockpile soil generated by construction activities onsite in a secure and safe manner. All contaminated soils determined to be hazardous or nonhazardous waste shall be adequately profiled (i.e., sampled and analyzed) prior to acceptable reuse or disposal at an appropriate offsite facility. Specific sampling
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

and handling and transport procedures for reuse or disposal shall be in accordance with applicable local, state, and federal agencies’ laws, in particular, the Regional Water Quality Control Board, the Department of Toxic Substances Control, and County of Sonoma Department of Health Services, Environmental Health and Safety. Groundwater pumped from the subsurface shall be contained onsite in a secure and safe manner, prior to treatment and disposal, to ensure environmental and health issues are resolved pursuant to applicable local, state, and federal laws, regulations, and policies. Material from existing roadway elements that is removed or modified by the project will be handled and disposed of in accordance with all local, state, and federal requirements.

The preliminary site investigation would cost between $20,000 and $100,000, depending on if groundwater sampling will be required, the number of samples and locations, and the types of analyses, and it would take 3 to 6 months to complete. Depending on the nature and extent of contamination observed, if any, the California Environmental Protection Agency, Department of Toxic Substances Control, State Water Resources Control Board, and/or Sonoma County Department of Health Services may need to be notified and become involved. Responsibility for cleanup costs would be determined during the design phase. Project staff will coordinate with the property owners regarding these cleanup costs.

For remediation and waste disposal, cleanup costs would range from $50,000 for soil cleanup only, to $100,000 or more if groundwater is affected. Cleanup would take 3 to 6 months if just soil is involved and longer if groundwater is affected.

2.2.6 Air Quality

2.2.6.1 Regulatory Setting
The Federal Clean Air Act, as amended, is the primary federal law that governs air quality, while the California Clean Air Act is its companion state law. These laws, and related regulations by the U.S. Environmental Protection Agency and California Air Resources Board, set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards. National Ambient Air Quality Standards and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter, which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM₁₀) and particles of 2.5 micrometers and smaller (PM₂.₅), and sulfur dioxide (SO₂). In addition, national and state standards exist for lead, and state standards exist for visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The National Ambient Air Quality Standards and state standards are set at levels that protect public health with a margin of safety, and they are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (i.e.,
air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under NEPA. In addition to this environmental analysis, a parallel “Conformity” requirement under the Federal Clean Air Act also applies.

**Conformity**

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to the State Implementation Plan for attaining the National Ambient Air Quality Standards. “Transportation Conformity” applies to highway and transit projects and takes place on two levels: the regional—or, planning and programming—level and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the National Ambient Air Quality Standards, and only for the specific National Ambient Air Quality Standards that are or were violated. U.S. Environmental Protection Agency regulations at 40 CFR 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for National Ambient Air Quality Standards and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the National Ambient Air Quality Standards for CO, NO₂, O₃, PM₁₀, PM₂.₅, and in some areas (although not in California) SO₂. California has attainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO₂ and also has a nonattainment area for lead; however, lead is not currently required by the Federal Clean Air Act to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans and Federal Transportation Improvement Programs that include all transportation projects planned for a region over a period of at least 20 years for the Regional Transportation Plan and 4 years for the Federal Transportation Improvement Program. Regional Transportation Plan and Federal Transportation Improvement Program conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the Clean Air Act and the State Implementation Plan are met. If the conformity analysis is successful, the Metropolitan Planning Organization, the Federal Highway Administration, and Federal Transit Administration make determinations that the Regional Transportation Plan and Federal Transportation Improvement Program are in conformity with the State Implementation Plan.
for achieving the goals of the Federal Clean Air Act. Otherwise, the projects in the Regional Transportation Plan and/or Federal Transportation Improvement Program must be modified until conformity is attained. If the design concept, scope, and “open-to-traffic” schedule of a proposed transportation project are the same as described in the Regional Transportation Plan and Federal Transportation Improvement Program, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Conformity analysis at the project level includes verification that the project is included in the regional conformity analysis and a “hot-spot” analysis if an area is “nonattainment” or “maintenance” for CO and/or particulate matter (PM$_{10}$ or PM$_{2.5}$). A region is “nonattainment” if one or more of the monitoring stations in the region measures a violation of the relevant standard and the U.S. Environmental Protection Agency officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially redesignated to attainment by the U.S. Environmental Protection Agency and are then called “maintenance” areas. “Hot-spot” analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific procedural and documentation standards for projects that require a hot-spot analysis. In general, projects must not cause the “hot-spot” related standard to be violated and must not cause any increase in the number and severity of violations in nonattainment areas. 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.

### 2.2.6.2 Affected Environment

The following section is summarized from the *Air Quality Study Report* (January 2016).

**Climate, Meteorology, and Topography**

Sonoma Valley is a long, narrow valley in southeastern Sonoma County aligned from north to south between the Sonoma Mountains to the west and the taller Mayacamas Mountains to the east. The project site is located in level terrain at an elevation of approximately 20 feet above mean sea level. The climate of the project area is relatively mild, with average maximum summer temperatures approaching 90 degrees Fahrenheit (°F) and average minimum winter temperatures below 40°F. Rainfall in southern Sonoma Valley averages approximately 29 inches per year, with most of the rain falling from November through March. Sheltered from the winds flowing through the Petaluma Gap, the Sonoma Valley winds are lighter than in the western portions of Sonoma County, and they tend to be from the south during the day and from the north during the night. The air pollution potential in Sonoma Valley is high. Prevailing winds can transport locally and regionally generated pollutants northward into the narrow valley, which often traps and concentrates the pollutants under stable conditions.
**Air Quality Pollutants of Concern and Attainment Status**

Air quality studies generally focus on six pollutants that are most commonly measured and regulated: CO, O³, NO₂, SO₂, PM₁₀, and PM₂.₅. The National Ambient Air Quality Standards and California Ambient Air Quality Standards have been established for criteria pollutants and are summarized in Table 2.2-5. The California Ambient Air Quality Standards are more stringent than the National Ambient Air Quality Standards; both the federal and state standards are used in the air quality analysis for this project. Health effects, typical sources, and the state and federal attainment status of each criteria pollutant for the Bay Area Air Basin are also identified in Table 2.2-5.

The project area is located within the Bay Area Air Basin. Within the project vicinity, air quality is monitored, evaluated, and controlled by the U.S. Environmental Protection Agency, Air Resources Board, and the Bay Area Air Quality Management District. These three agencies develop rules and regulations to attain the goals or directives imposed by legislation. The major elements of the air quality regulatory framework are summarized in Section 2.2.6.1, Regulatory Setting, above.

The U.S. Environmental Protection Agency has classified air basins (or portions thereof) as being in attainment, nonattainment, or unclassified for each criteria air pollutant, based on whether the National Ambient Air Quality Standards have been achieved. An area is designated unclassified when insufficient air quality data are available on which to base an attainment or nonattainment designation. The U.S. Environmental Protection Agency classified the Bay Area Air Basin as nonattainment for O³ for the federal 8-hour standard and PM₂.₅ for the federal 24-hour standard.

The Air Resources Board regulates mobile emissions sources and oversees the activities of county and regional air quality management districts. The Air Resources Board regulates local air quality indirectly by establishing vehicle emission standards through its planning, coordinating, and research activities. California has adopted ambient standards that are more stringent than the national standards for the criteria air pollutants. Under the California Clean Air Act, areas are also designated as being in attainment, in nonattainment, or unclassified with respect to the California Ambient Air Quality Standards. The California Clean Air Act requires that districts design a plan to achieve an annual reduction of 5 percent or more in district-wide emissions for each nonattainment criteria pollutant or its precursor(s). The Bay Area Air Basin is in nonattainment for O³ for the state 1- and 8-hour standard, PM₁₀ for the state 24-hour and annual standard, and PM₂.₅ for the state annual standard.

---

5 A precursor is a compound that chemically reacts with another to form a criteria pollutant. For example, organic compounds are precursors for O³.
### Table 2.2-5: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

|----------------------------------|----------------|----------------|------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------************************************************************************|-------------------------------------|--------------------------------------|
| Ozone (O₃)                       | 1 hour         | 0.090 ppm³     | --- ⁴           | High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic volatile organic compounds may also contribute. | Low-altitude O₃ is almost entirely formed from reactive organic gases (ROG)/volatile organic compounds and nitrogen oxides (NOₓ) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes. | Nonattainment                      | N/A                                  |
|                                  | 8 hours        | 0.070 ppm      | 0.070 ppm (4th highest in 3 years) |                                                                                                           |                                                                                                                                                                                                                                                               | Nonattainment                      | Nonattainment                       |
|                                  | 8 hours        | 6 ppm          |                  |                                                                                                           |                                                                                                                                                                                                                                                               | Attainment                          | Attainment                          |
|                                  | (Lake Tahoe)   |                |                  |                                                                                                           |                                                                                                                                                                                                                                                               | Attainment                          | Attainment                          |
| Carbon Monoxide (CO)             | 1 hour         | 20 ppm         | 35 ppm           | CO interferes with the transfer of oxygen to the blood and depletes sensitive tissues of oxygen. CO also is a minor precursor for photochemical O₃. Colorless, odorless.                                                                                           | Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.                                                                 | Attainment                          | Attainment                          |
|                                  | 8 hours        | 9 ppm          | 9 ppm            |                                                                                                           |                                                                                                                                                                                                                                                               | Attainment                          | Attainment                          |
|                                  |                | 8 ppm          |                  |                                                                                                           |                                                                                                                                                                                                                                                               | Attainment                          | Attainment                          |
| Respirable Particulate Matter (PM₁₀)² | 24 hours   | 50 μg/m³³ ⁶     | 150 μg/m³³ (expected number of days above standard < or equal to 1) | Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic and other aerosol and solid compounds are part of PM₁₀. | Dust- and fume-producing industrial and agricultural operations; combustion smoke and vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources. | Nonattainment                      | Unclassified                        |
|                                  | Annual         | 20 μg/m³⁵      |                  |                                                                                                           |                                                                                                                                                                                                                                                               | Nonattainment                      | N/A                                 |
Table 2.2-5: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

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<tr>
<td>Fine Particulate Matter (PM$_{2.5}$)</td>
<td>24 hours</td>
<td>---</td>
<td>35 µg/m$^3$</td>
<td>Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the PM$<em>{2.5}$ size range. Many toxic and other aerosol and solid compounds are part of PM$</em>{2.5}$.</td>
<td>Combustion, including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NO$_x$, sulfur oxides, ammonia, and ROG.</td>
<td>N/A</td>
<td>Nonattainment</td>
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<tr>
<td></td>
<td>Annual</td>
<td>12 µg/m$^3$</td>
<td>12 µg/m$^3$</td>
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<td>Nitrogen Dioxide (NO$_2$)</td>
<td>1 hour</td>
<td>0.180 ppm</td>
<td>0.100 ppm$^3$</td>
<td>Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain and nitrate contamination of stormwater. Part of the &quot;NOx&quot; group of O$_3$ precursors.</td>
<td>Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations.</td>
<td>Attainment</td>
<td>Unclassified</td>
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<tr>
<td></td>
<td>Annual</td>
<td>0.030 ppm</td>
<td>0.053 ppm</td>
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<tr>
<td>Sulfur Dioxide (SO$_2$)</td>
<td>1 hour</td>
<td>0.250 ppm</td>
<td>0.075 ppm$^9$</td>
<td>Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.</td>
<td>Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.</td>
<td>Attainment</td>
<td>Attainment</td>
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<td></td>
<td>3 hours</td>
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<td>0.500 ppm$^{10}$</td>
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<td></td>
<td>24 hours</td>
<td>0.040 ppm</td>
<td>0.140 ppm</td>
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<tr>
<td></td>
<td>Annual</td>
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<td>0.030 ppm</td>
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SR 116/121 Intersection Improvements Project IS/EA
Table 2.2-5: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

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<tr>
<td>Lead&lt;sup&gt;11&lt;/sup&gt;</td>
<td>Monthly</td>
<td>1.500 μg/m³</td>
<td>---</td>
<td>Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.</td>
<td>Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from older gasoline use may exist in soils along major roads.</td>
<td>Attainment</td>
<td>N/A</td>
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<td>Calendar Quarter</td>
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<td>1.500 μg/m³ (for certain areas)</td>
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<td>N/A</td>
<td>Attainment</td>
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<td>Rolling 3- month average</td>
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<td>0.150 μg/m³</td>
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<td>N/A</td>
<td>Attainment</td>
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<tr>
<td>Sulfate</td>
<td>24 hours</td>
<td>25 μg/m³</td>
<td>---</td>
<td>Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.</td>
<td>Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.</td>
<td>Attainment</td>
<td>N/A</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>1 hour</td>
<td>0.030 ppm</td>
<td>---</td>
<td>Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea. Strong odor.</td>
<td>Industrial processes, such as refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.</td>
<td>Unclassified</td>
<td>N/A</td>
</tr>
<tr>
<td>Vinyl Chloride&lt;sup&gt;11&lt;/sup&gt;</td>
<td>24 hours</td>
<td>0.010 ppm</td>
<td>---</td>
<td>Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.</td>
<td>Industrial processes.</td>
<td>No Data</td>
<td>N/A</td>
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**Table 2.2-5: State and Federal Criteria Air Pollutant Standards, Effects, and Sources**

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1. State standards are “not to exceed” or “not to be equaled or exceeded” unless stated otherwise.
2. Federal standards are “not to exceed more than once a year” or as described above.
3. ppm = parts per million
4. Prior to 6/2005, the 1-hour O₃ National Ambient Air Quality Standard was 0.12 ppm. Emission budgets for 1-hour O₃ are still in use in some areas where 8-hour O₃ emission budgets have not been developed, such as the San Francisco Bay Area.
5. Annual PM₁₀ National Ambient Air Quality Standards revoked October 2006; was 50 μg/m⁴. 24-hour PM₂.₅ National Ambient Air Quality Standard tightened October 2006; was 65 μg/m⁴. Annual PM₂.₅ National Ambient Air Quality Standard tightened from 15 μg/m³ to 12 μg/m³ December 2012 and secondary annual standard set at 15 μg/m³.
6. μg/m³ = micrograms per cubic meter
7. The 65 μg/m³ PM₂.₅ (24-hour) National Ambient Air Quality Standard was not revoked when the 35 μg/m³ National Ambient Air Quality Standard was promulgated in 2006. The 15 μg/m³ annual PM₂.₅ standard was not revoked when the 12 μg/m³ standard was promulgated in 2012. The 0.08 ppm 1997 O₃ standard is revoked FOR CONFORMITY PURPOSES ONLY when area designations for the 2008 0.75 ppm standard become effective for conformity use (7/20/2013). Conformity requirements apply for all National Ambient Air Quality Standards, including revoked National Ambient Air Quality Standards, until emission budgets for newer National Ambient Air Quality Standards are found adequate, State Implementation Plan amendments for the newer National Ambient Air Quality Standards are approved with an emissions budget, the U.S. Environmental Protection Agency specifically revokes conformity requirements for an older standard, or the area becomes attainment/unclassified. State Implementation Plan-approved emission budgets remain in force indefinitely unless explicitly replaced or eliminated by a subsequent approved State Implementation Plan amendment. During the “Interim” period prior to availability of emission budgets, conformity tests may include some combination of build versus no build, build versus baseline, or compliance with prior emission budgets for the same pollutant.
9. The U.S. Environmental Protection Agency finalized a 1-hour SO₂ standard of 75 parts per billion (thousand million) in June 2010. Nonattainment areas have not yet been designated as of 3/2016.
10. Secondary standard, set to protect public welfare rather than health. Conformity and environmental analysis address both primary and secondary National Ambient Air Quality Standards.
11. The Air Resources Board has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM₁₀ and, in larger proportion, PM₂.₅. Both the Air Resources Board and the U.S. Environmental Protection Agency have identified lead and various organic compounds that are precursors to O₃ and PM₂.₅ as toxic air contaminants. There are no exposure criteria for adverse health effects due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.
12. Lead National Ambient Air Quality Standards are not considered in Transportation Conformity analysis.

The Bay Area Air Quality Management District has jurisdiction over air quality in the Bay Area Air Basin and regulates most air pollutant sources except for motor vehicles, locomotives, aircraft, agriculture equipment, and marine vessels. In 1996, the Bay Area Air Quality Management District published its CEQA Guidelines (revised in 1999), which advises local jurisdictions on procedures for addressing air quality in environmental documents. The Bay Area Air Quality Management District coordinates with the Association of Bay Area Governments and the Metropolitan Transportation Commission in the development and implementation of transportation plans required by the federal and state Clean Air Acts.

**Existing Air Quality**

The project site is located in a rural area of southern Sonoma County. The air quality monitoring station closest to the project site is located approximately 10 miles to the east in Napa, and the second-closest monitoring station is located approximately 20 miles to the northwest in Santa Rosa. Both of these monitoring stations are located in urban areas far from the project site, separated from it by substantial topography. Air quality data collected at these urban sites is not representative of air quality conditions at the rural project site. Air pollutant concentrations at the project site are assumed to be lower than at the Napa and Santa Rosa monitoring stations. Monitoring data for these sites can be seen in Tables 4-1 and 4-2 of the Air Quality Study Report.

**2.2.6.3 Environmental Consequences**

**Project-Level Impacts**

**Build Alternatives**

The impacts of both build alternatives would be the same as one another. Generally, a transportation project is not a project of concern unless it changes capacity or alignment of a road with more than 125,000 average annual daily traffic and 8 percent trucks (more than 10,000 truck average annual daily traffic [8 percent of 125,000]), or otherwise may substantially increase or concentrate diesel exhaust emissions. Interagency consultation concurrence is required for determinations that a project is not a "Project of Air Quality Concern."

This project does not change the alignment of or increase the capacity of SR 116 or SR 121 in the project area. The project was determined to not be a Project of Air Quality Concern after interagency consultation was completed in December 2015. A copy of this agency correspondence is included in Appendix G.

**Transportation Conformity with Air Quality Plans**

This project is exempt from regional (40 CFR 93.127) conformity requirements. Separate listing of the project in the Regional Transportation Plan and Transportation Improvement Program, and their regional conformity analyses, is not necessary. The project will not interfere
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

with timely implementation of Transportation Control Measures identified in the applicable State Implementation Plan and regional conformity analysis.

However, the proposed project is listed in Plan Bay Area 2040, adopted in 2013 by the Metropolitan Transportation Commission (Regional Transportation Plan ID No. 22190), and the financially constrained Regional Transportation Plan, which was found to conform by the Metropolitan Transportation Commission on July 18, 2013 (Metropolitan Transportation Commission Resolution No. 4076) (Metropolitan Transportation Commission, 2013). The Federal Highway Administration and the Federal Transit Administration made a regional conformity determination on August 12, 2013. The project is also included in the Metropolitan Transportation Commission’s 2015 Transportation Improvement Program, which was adopted by the Metropolitan Transportation Commission on September 24, 2014 (Transportation Improvement Program ID No. SON150009). The Federal Highway Administration and the Federal Transit Administration approved the 2015 Transportation Improvement Program on December 15, 2014. The design concept and scope of the proposed project is consistent with the project description in the 2013 Regional Transportation Plan and the 2015 Transportation Improvement Program, and the open to traffic assumptions of the Metropolitan Transportation Commission’s regional emissions analysis. Caltrans requested that the Federal Highway Administration issue a project-level conformity determination for this project on January 26, 2016, confirming that the project conforms to the purpose of the State Implementation Plan for achieving the National Ambient Air Quality Standards. The Federal Highway Administration provided the conformity determination on February 14, 2017 (included in Appendix G).

Evaluation of Potential for Traffic-Related Carbon Monoxide Impacts

A CO hot-spot analysis is required for this project because the project area is in a CO maintenance area. This analysis followed the procedures in Transportation Project-Level Carbon Monoxide Protocol, prepared by the University of California, Davis, Institute of Transportation Studies (1998). This protocol applies screening procedures, based on the attainment status of the area in which the project is planned, to evaluate potential CO impacts of the project and assess the need for any further detailed analysis. Based on the CO Protocol, the screening procedure in “Level 7” was followed to screen the alternatives for the following criteria:

a) **The project would not significantly increase the percentage of vehicles operating in cold-start mode.** Given its nature, the project – converting a stop-controlled intersection to a roundabout or to a signalized intersection – would have no direct or measurable effect on the percentage of vehicles operating in the cold-start mode.

b) **The project would not significantly increase traffic volumes.** The nature of the project is such that it would not affect local traffic volumes. Intersection improvement
projects do not generate traffic, and regional traffic modeling has demonstrated that the project would not induce additional regional traffic. Traffic modeling results can be seen in Section 2.1.6 of this IS/EA or in the Traffic Operations Analysis Report.

c) The project would not worsen traffic flow. Both build alternatives would improve traffic flow through the intersection, resulting in significantly reduced average delay. Either a roundabout or a signalized intersection would have greater hourly traffic capacity than a stop-controlled intersection. Estimated LOS and intersection delay for the No Build Alternative and build alternatives are provided in Sections 2.1.6.2 and 2.1.6.3.

Based on the CO Protocol, neither build alternative would result in an exceedance of the federal or state CO standards.

Particulate Matter “Hot Spot” Analysis

A particulate matter “hot spot” analysis is required because the area is nonattainment for the federal PM\textsubscript{2.5} standard. The U.S. Environmental Protection Agency specifies in 40 CFR 93.123(b)(1) that only “projects of air quality concern” are required to undergo a PM\textsubscript{2.5} and PM\textsubscript{10} hot-spot analysis. The U.S. Environmental Protection Agency defines projects of air quality concern as certain highway and transit projects that involve significant levels of diesel traffic or any other project that is identified in the PM\textsubscript{2.5} State Implementation Plan as a local air quality concern.

Based on the recent interagency consultation with the Air Quality Conformity Task Force, completed in December 2015, this project does not fit the definition of a Project of Air Quality Concern as defined by 40 CFR 93.123(b)(1); therefore, a quantitative PM\textsubscript{2.5} hot-spot analysis is not required. A copy of this agency correspondence is included in Appendix G.

Operational Air Quality Impacts from Criteria Pollutants

The build alternatives would modify the SR 116/121 intersection to improve vehicle flow and reduce delays. Intersection improvement projects do not generate new vehicle trips, but they may increase or decrease exhaust emissions of criteria air pollutants, including CO, PM\textsubscript{10}, PM\textsubscript{2.5}, and the O\textsubscript{3} precursors reactive organic gases (ROG) and nitrogen oxides (NO\textsubscript{X}), due to changes in vehicle speeds, queuing, and delay times. In addition to vehicle exhaust, dust is carried by vehicles traveling on paved roads. Intersection modifications are not anticipated to result in substantial changes in the amount of entrained dust, however, so these emissions were not included in the emissions calculations for the project.

Intersection improvement projects also may change the level of exposure of sensitive receptors to air pollutants. Sensitive receptors are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants. Caltrans defines sensitive receptors, or sensitive land uses, as schools, medical centers and facilities,
health care facilities, child care facilities, parks, and playgrounds. Residential land uses also are considered to be sensitive receptors. The area adjacent to the project site consists primarily of agricultural lands, a few rural residences, and, adjacent to the highways, a gas station, motel, and other service retail uses. Of these land uses, only the rural residential use meets Caltrans' definition of a sensitive land use. The closest residence is located along SR 121 east of the SR 116/121 intersection, and approximately 300 feet from its center.

Under the No Build Alternative, the number of vehicles queuing at the stop-controlled intersection would increase, with increased idling time and exhaust emissions. Under the Roundabout Alternative, vehicles would not queue and would pass through the intersection at speeds between 15 and 25 mph. Under the Signalized Intersection Alternative, some vehicles would pass through the intersection without stopping, while other vehicles would be delayed, with the length of delay depending on signal timing and vehicle volumes. These minor differences in vehicle operations at the intersection are reflected in incremental differences in amounts of exhaust air pollutant emissions.

Criteria air pollutant exhaust emissions within 0.5 mile of the SR 116/121 intersection were estimated for the existing stop-controlled intersection and the build alternatives for 2014, 2020, and 2040 conditions using CT-EMFAC with EMFAC2011 emissions factors (carbon dioxide is discussed in Section 2.5, Climate Change). These annual emissions estimates assumed a uniform reduction in vehicle speed as vehicles approached and a uniform increase in vehicle speed as vehicles departed the intersection. The average vehicle idling times at the intersection were based on delay durations calculated for the Traffic Operations Analysis Report (2015). Vehicle speeds through the roundabout were also provided by the traffic study. The results are presented in Table 2.2-6.

<table>
<thead>
<tr>
<th>Alternative / Year</th>
<th>ROG</th>
<th>CO</th>
<th>NOX</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Build Alternative</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>7.3</td>
<td>74.5</td>
<td>12.8</td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td>2020</td>
<td>4.7</td>
<td>44.9</td>
<td>8.4</td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td>2040</td>
<td>4.0</td>
<td>36.5</td>
<td>6.2</td>
<td>1.8</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Roundabout Alternative</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>4.0</td>
<td>39.8</td>
<td>7.3</td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td>2040</td>
<td>3.3</td>
<td>32.1</td>
<td>5.1</td>
<td>1.8</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Signalized Intersection Alternative</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>4.7</td>
<td>44.2</td>
<td>8.0</td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td>2040</td>
<td>4.0</td>
<td>35.0</td>
<td>5.8</td>
<td>1.8</td>
<td>0.7</td>
</tr>
</tbody>
</table>

*Source: Air Quality Study Report, 2016.*
The emissions calculations indicate that neither of the build alternatives would increase emissions of criteria air pollutants or precursors relative to the No Build Alternative in the vicinity of the SR 116/121 intersection. A much greater reduction would occur under the Roundabout Alternative. Although the calculations are based on average daily emissions, these results are expected to be generally representative of peak-hour conditions as well. Under the Roundabout Alternative, vehicle idling emissions at the intersection would be eliminated or substantially reduced, along with vehicle start-up and low speed emissions. The Roundabout Alternative would provide greater reductions in air pollutant emissions relative to the No Build Alternative than would the Signalized Intersection Alternative. Future PM$_{10}$ and PM$_{2.5}$ emissions would be approximately the same among the three alternatives, and CO, NOx, and ROG emissions would be lower than under the No Build Alternative. Future PM$_{10}$ emissions are projected to increase under the build alternatives and No Build Alternative due to the projected increase in traffic volumes.

**Regional Air Pollutant Cumulative Impact Analysis**

Projects included in the cumulative scenario include local projects whose effects may be individually distinguishable and general growth within the region. The greatest source of cumulative air pollutant emissions within the study area is vehicular traffic generated by new development within the region; therefore, local air quality is heavily influenced by cumulative traffic growth generated outside of the study area. Air pollutant emissions from the project, combined with all other emissions in the region, may have an indirect or cumulative effect on a regional scale. The SR 116/121 project is included in the Regional Transportation Plan and has demonstrated regional conformity, and it would not have a cumulatively significant adverse impact on regional air quality.

**Mobile Source Air Toxics**

In addition to the criteria air pollutants for which standards exist, the U.S. Environmental Protection Agency also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources. Mobile source air toxics are a subset of the air toxics defined by the federal 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.

Mobile source air toxics emissions were evaluated using a combination of Federal Highway Administration’s *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents* (FHWA, 2012) and California-specific guidance found in California Air Resources Board’s *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB, 2005). Federal Highway Administration’s interim guidance recommends a tiered approach to
how mobile source air toxics should be addressed in NEPA documents for highway projects. The Federal Highway Administration has identified three levels of analysis: (1) No analysis for exempt projects or projects with no potential for meaningful mobile source air toxics effects; (2) Qualitative analysis for projects with low potential mobile source air toxics effects; and (3) Quantitative analysis to differentiate alternatives for projects with higher potential mobile source air toxics effects. The project appears to qualify as a project with low potential mobile source air toxic effects; therefore, a qualitative analysis was completed.

California's vehicle emissions control and fuel standards are more stringent than federal standards and are effective sooner, so the effect on air toxics of combined state and federal regulations is expected to result in greater emission reductions, more quickly, than the Federal Highway Administration analysis shows. The Federal Highway Administration analysis, with modifications related to use of the California-specific EMFAC model rather than the MOBILE model, would be conservative. Note that California also does not use the MOBILE model but instead uses the latest version of the EMFAC model.

The amounts of mobile source air toxics emitted would normally be proportional to the vehicle miles traveled generated by the project, assuming other variables, such as vehicle speed, LOS, or fleet mix, are the same for each alternative. Operation of the build alternatives would not generate vehicle miles traveled. Instead, the build alternatives would improve intersection operations compared to those under the No Build Alternative, and these improved operations would result in fewer emissions of mobile source air toxics and other air pollutants. The reduction in mobile source air toxics emissions would be roughly proportional to the reduction in traffic congestion, as measured by the change in LOS.

Regardless of the alternative selected, mobile source air toxics emissions in the horizon year (2040) are expected to be lower than at present as a result of the U.S. Environmental Protection Agency’s national control programs, which are projected to reduce annual mobile source air toxics emissions by more than 80 percent between 2010 and 2050. Local conditions may differ from national projections due to differences in fleet mix, fleet turnover, regional vehicle miles traveled growth rates (due to other development/transportation projects), and local control measures; however, the magnitude of the U.S. Environmental Protection Agency-projected reductions is so great – even after accounting for regional vehicle miles traveled growth – that mobile source air toxics emissions in the study area are expected to be lower in the future.

In summary, under the build alternatives in the design year (2040), mobile source air toxics emissions in the study area are expected to be similar to those under the No Build Alternative and lower than at present due to U.S. Environmental Protection Agency’s mobile source air toxics reduction programs.
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Air Quality CEQA Compliance

In accordance with CEQA, compliance with California Ambient Air Quality Standards was reviewed to evaluate the potential to violate State air quality standards or contribute substantially to an existing or projected air quality violation.

As shown in Table 2.2-5, the project area is in attainment for State CO, NO₂, and SO₂ standards and in nonattainment for State standards for O₃, PM₁₀, and PM₂.₅. Based on the CO protocol procedures described above (see discussion under the heading Evaluation of Potential for Traffic-Related Carbon Monoxide Impacts), the build alternatives and No Build Alternative are not expected to cause an exceedance of the State CO standards. With regard to potential operational impacts for PM₁₀, PM₂.₅, and O₃ for the build alternatives and No Build Alternative, the amount of the respective pollutants emitted is due to changes in vehicle speeds, queuing, and delay times. As previously indicated in the section “Operational Air Quality Impacts from Criteria Pollutants,” the emissions calculations indicate that neither of the build alternatives would increase emissions of criteria air pollutants or precursors relative to the No Build Alternative in the vicinity of the SR 116/121 intersection. Future PM₁₀ and PM₂.₅ emissions would be approximately the same among the three alternatives, and CO, NOₓ, and ROG emissions would be lower than under the No Build Alternative.

No Build Alternative

As shown above in Table 2.2-6, air quality would continue to worsen in the study area under the No Build Alternative due to worsening congestion, slower speeds, queuing, and delay times.

Construction Impacts

Build Alternatives

The impacts of both build alternatives would be very similar to one another. Construction activities for both build alternatives would not last for more than 5 years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analysis (40 CFR 93.123(c)(5)).

Project construction would generate fugitive (airborne) dust and exhaust emissions that would have direct temporary effects on local air quality. These emissions would result from earthmoving and use of heavy equipment, as well as from land clearing, ground excavation, and construction of the highway. Dust emissions can vary substantially from day to day, depending on the level of activity, the specific operations, and the prevailing weather. The largest source of dust emissions during construction would likely be from construction traffic in temporary construction areas.
Construction emissions were estimated with the Sacramento Metropolitan Air Quality Management District’s *Road Construction Emissions Model*. Inputs to this Excel-based spreadsheet model include project type; construction year; project footprint and maximum disturbed area; construction schedule and duration; soil type; materials transported to and from the site; and whether the site will be watered to control dust. The model uses EMFAC2011, which calculates air pollution emissions factors for passenger cars, trucks, motorcycles, motor homes, and buses. The model outputs estimated tons of criteria air pollutants and carbon dioxide for the construction period. Estimates of the total project construction emissions are presented in Table 2.2-7.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>ROG</th>
<th>CO</th>
<th>NOx</th>
<th>PM$_{10}$</th>
<th>PM$_{2.5}$</th>
<th>CO$_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundabout Alternative</td>
<td>0.9</td>
<td>4.6</td>
<td>10.1</td>
<td>5.0</td>
<td>1.4</td>
<td>1,060</td>
</tr>
<tr>
<td>Signalized Intersection Alternative</td>
<td>1.0</td>
<td>4.9</td>
<td>10.6</td>
<td>5.6</td>
<td>1.6</td>
<td>1,107</td>
</tr>
</tbody>
</table>

ROG – reactive organic gases, CO – carbon monoxide, NO$_x$ – nitrogen oxides, PM$_{10}$ – particulates 10 microns and under, PM$_{2.5}$ – particulates 2.5 microns and under, CO$_2$ – carbon dioxide.


**No Build Alternative**

The No Build Alternative would not contribute to air quality impacts during construction because construction activities would not occur.

**2.2.6.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures**

No operational mitigation measures are required because the build alternatives would not result in significant adverse operational air quality impacts. Most of the temporary construction impacts on air quality are short term in duration; therefore, they would not result in long-term adverse conditions. The construction contractor must comply with the Caltrans Standard Specifications in Section 14-9 (2010). Section 14-9.02 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances. Section 14-9.03 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are described in Section 18. Implementation of the following project features would substantially reduce any air quality impacts resulting from construction activities:
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

- **PF AQ-1**: Water or dust palliative (suppressant) will be applied to the site and equipment as often as necessary to control fugitive dust emissions. Fugitive emissions generally must meet a “no visible dust” criterion either at the point of emissions or at the ROW line depending on local regulations. Trucks will be washed as they leave the ROW, as necessary, to control fugitive dust emissions.

- **PF AQ-2**: Soil binder will be spread on any unpaved roads used for construction purposes and on all project construction parking areas. Soil binders are materials applied to the soil surface to temporarily prevent water-induced erosion of exposed soils on construction sites.

- **PF AQ-3**: Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low sulfur fuel as required by California Code of Regulations Title 17, Section 93114.

- **PF AQ-4**: A dust control plan will be developed documenting sprinkling, temporary paving, speed limits, and timely revegetation of disturbed slopes as needed to minimize construction impacts to existing communities.

- **PF AQ-5**: Equipment and materials storage sites will be located as far away from residential uses as practicable. Construction areas will be kept clean and orderly.

- **PF AQ-6**: Environmentally Sensitive Area-like areas or their equivalent will be established near sensitive air receptors. Within these areas, construction activities involving the extended idling of diesel equipment or vehicles will be prohibited, to the extent feasible.

- **PF AQ-7**: Track-out reduction measures, such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic, will be used. Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed with a street cleaning vehicle to decrease particulate matter.

- **PF AQ-8**: All transported loads of soils and wet materials will be covered before transport, or adequate freeboard (space from the top of the material to the top of the truck) will be provided to minimize emission of dust (particulate matter) during transportation.

- **PF AQ-9**: To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.

- **PF AQ-10**: Mulch will be installed or vegetation planted as soon as practical after grading to reduce windblown particulate in the area. Be aware that certain methods of mulch placement, such as straw blowing, may themselves cause dust and visible emission issues and may need to use controls such as dampened straw.

### 2.2.6.5 Climate Change

Climate change is analyzed at the end of this chapter. Neither the U.S. Environmental Protection Agency nor the Federal Highway Administration has issued explicit guidance or
methods to conduct project-level greenhouse gas analysis. As stated on Federal Highway Administration’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 aid decision making and improve efficiency at the program level, and it 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 quality of life.

Because there have been more requirements set forth in California legislation and executive orders on climate change, the issue is addressed in a separate CEQA discussion at the end of this chapter and may be used to inform the NEPA decision. The four strategies set forth by the Federal Highway Administration to lessen climate change impacts 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.

2.2.7 Noise

2.2.7.1 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.

**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 those measures are not feasible. The CEQA noise analysis is included at the end of this section.

**National Environmental Policy Act and 23 CFR 772**

For highway transportation projects with Federal Highway Administration (and Caltrans, 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 include noise abatement...
criteria that are used to determine when a noise impact would occur. The noise abatement criteria differ depending on the type of land use under analysis. For example, the noise abatement criterion for residences (67 A-weighted decibels [dBA]) is lower than the noise abatement criterion for commercial areas (72 dBA). Table 2.2-8 lists the noise abatement criteria for use in the NEPA 23 CFR 772 analysis.

### Table 2.2-8: Noise Abatement Criteria

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Noise Abatement Criteria, Hourly A-Weighted Noise Level, $L_{eq}(h)$</th>
<th>Description of Activity Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>57 (Exterior)</td>
<td>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.</td>
</tr>
<tr>
<td>B&lt;sup&gt;1&lt;/sup&gt;</td>
<td>67 (Exterior)</td>
<td>Residential.</td>
</tr>
<tr>
<td>C&lt;sup&gt;1&lt;/sup&gt;</td>
<td>67 (Exterior)</td>
<td>Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day-care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.</td>
</tr>
<tr>
<td>D</td>
<td>52 (Interior)</td>
<td>Auditoriums, day-care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.</td>
</tr>
<tr>
<td>E</td>
<td>72 (Exterior)</td>
<td>Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.</td>
</tr>
<tr>
<td>F</td>
<td>No noise abatement criteria—reporting only</td>
<td>Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (e.g., water resources, water treatment, electrical), and warehousing.</td>
</tr>
<tr>
<td>G</td>
<td>No noise abatement criteria—reporting only</td>
<td>Undeveloped lands that are not permitted.</td>
</tr>
</tbody>
</table>

<sup>1</sup> Includes undeveloped lands permitted for this activity category.

Figure 2.2-6 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.
Figure 2.2-6: Noise Levels of Common Activities

According to Caltrans’ Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects (May 2011), a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the noise abatement criteria. Approaching the noise abatement criteria is defined as coming within 1 dBA of the noise abatement criteria.

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.

Caltrans’ 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 and the cost per benefited residence.

### 2.2.7.2 Affected Environment

The following summarizes the *Noise Study Report* (January 2016) and the *Noise Abatement Decision Report* (April 2016) and discusses anticipated noise effects of the build alternatives and recommended noise abatement measures. Layouts showing the location of noise-sensitive receptors and noise measurements are shown in Figures 2.2-7 and 2.2-8. Four outdoor noise measurements were conducted throughout the study area to evaluate existing noise levels and to calibrate the Federal Highway Administration Traffic Noise Model. Short-term noise measurements were conducted at two sites on May 5, 2015, for a duration of 20 minutes at each site. Long-term monitoring was conducted at two locations from May 4 to 5, 2015, for 24-hour periods. Although all developed land uses are evaluated, noise abatement is only considered for areas of frequent human use that would benefit from a lowered noise level. Accordingly, this impact analysis focuses on locations with defined outdoor activity areas, such as residential backyards, seating areas of commercial establishments, and the pool area of the hotel. The study area was divided into four areas for this analysis, which is shown in Figures 2.2-7 and 2.2-8:

- **Area A**: Area A is located north of Bonneau Road and west of SR 116/Arnold Drive. A winery (Activity Category E) with an outdoor seating area is located in this area. The seating area has exposure to SR 116 traffic. This area is generally flat, with no existing noise barrier or topographic shielding located between the highway and the winery.

- **Area B**: Area B is located north of SR 121/Fremont Drive and east of SR 116/Arnold Drive. The land use in this area is agricultural (Activity Category F). Area B is generally flat, with no existing noise barrier or topographic shielding located between the highway and the agricultural land use.

- **Area C**: Area C is located south of Bonneau Road and west of SR 121/Arnold Drive. A single-family residence (Activity Category B), which also serves as a winery (Activity Category E), is located in this area. In addition, there is a warehouse, a deli, a gas station, and agricultural land uses in Area C (Activity Category F). The outdoor use area of the single-family residence/winery (backyard) is shielded from traffic noise by the building. This area is generally flat, with no topographic shielding located between the highway and the land uses.
Figure 2.2-7: Noise Receptors and Measurement Locations for the Roundabout Alternative
Figure 2.2-8: Noise Receptors and Measurement Locations for the Signalized Intersection Alternative
• **Area D:** Area D is located south of SR 121/Fremont Drive and east of SR 121/Arnold Drive. Three single-family residences (Activity Category B) and a hotel (Activity Category E) are located in this area. There are also commercial retail facilities and land used for livestock (Activity Category F). The outdoor use areas of two of the three single-family residences (backyards) are shielded from traffic noise by the residential buildings. The third single-family residence has full exposure to SR 121 traffic. The pool area of the hotel is shielded from traffic noise by an existing property wall. This area is generally flat, with no topographic shielding located between the highway and the land uses.

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

2.2.7.3 **Environmental Consequences**

**Project-Level Impacts**

**Build Alternatives**
The impacts of both build alternatives would be very similar to one another. The proposed project is a Type 1 project. A Type 1 project is a project that involves construction of a highway on a new location, the physical alteration of an existing highway, the addition of through-traffic lanes, or restriping existing pavement. Under Title 23 CFR 772.11, noise abatement must be considered for Type 1 projects if the project is predicted to result in a traffic noise impact.

Noise modeling was completed to determine the future (2040) predicted noise levels at receptors in the study area. Table 2.2-9 shows the results of this modeling for both build alternatives. The location of noise receptors for both build alternatives is shown in Figures 2.2-7 and 2.2-8. If the predicted noise level approaches or exceeds the noise abatement criteria or is predicted to substantially exceed the existing noise level, an impact would occur and abatement measures for those locations are considered through the *Noise Abatement Decision Report*.

Under both build alternatives, results of the *Noise Study Report* indicate that predicted traffic noise levels ($L_{eq}[h]$) for the design year 2040 with-project conditions approach or exceed the noise abatement criteria of 67 dBA for Activity Category B land uses at one of the residences in the study area (Receptor 15). Therefore, traffic noise impacts are predicted to occur at Activity Category B land uses within the project area under both build alternatives. There were no substantial noise increases as a result of the project.
Table 2.2-9: Existing (2014) and Predicted Future (2040) Noise Levels

<table>
<thead>
<tr>
<th>Area/Receptor ID</th>
<th>Existing 2014 Noise Level (dBA)</th>
<th>Predicted 2040 Noise Level with No Build Alternative (dBA)</th>
<th>Predicted 2040 Noise Level with Roundabout/Signalized Intersection (dBA)</th>
<th>Activity Category (Noise Abatement Criteria)</th>
<th>Approach or Exceeds Noise Abatement Criteria?</th>
<th>Reasonable and Feasible</th>
</tr>
</thead>
<tbody>
<tr>
<td>A / R 1</td>
<td>61</td>
<td>61</td>
<td>63 / 65</td>
<td>E (72)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>A / R 2</td>
<td>63</td>
<td>63</td>
<td>66 / 68</td>
<td>E (72)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>B / R 3</td>
<td>61</td>
<td>61</td>
<td>64 / 65</td>
<td>F (-)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>B / R 4</td>
<td>63</td>
<td>64</td>
<td>67 / 67</td>
<td>F (-)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>C / R 5</td>
<td>50</td>
<td>51</td>
<td>52 / 53</td>
<td>B (67)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>C / R 6</td>
<td>62</td>
<td>62</td>
<td>62 / 65</td>
<td>F (-)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>C / R 7</td>
<td>62</td>
<td>63</td>
<td>66 / 65</td>
<td>F (-)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>D / R 8</td>
<td>57</td>
<td>58</td>
<td>60 / 60</td>
<td>B (67)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>D / R 9</td>
<td>71</td>
<td>72</td>
<td>73 / 73</td>
<td>F (-)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>D / R 10</td>
<td>63</td>
<td>63</td>
<td>66 / 66</td>
<td>F (-)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>D / R 11</td>
<td>60</td>
<td>60</td>
<td>62 / 62</td>
<td>E (72)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>D / R 12</td>
<td>60</td>
<td>61</td>
<td>63 / 63</td>
<td>B (67)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>D / R 13</td>
<td>59</td>
<td>59</td>
<td>61 / 62</td>
<td>F (-)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>D / R 14</td>
<td>70</td>
<td>71</td>
<td>71 / 72</td>
<td>F (-)</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>D / R 15</td>
<td>65</td>
<td>65</td>
<td>67 / 67</td>
<td>B (67)</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes:
1 Receptor locations are shown on the layout sheets in Appendix F of the Noise Study Report and are also included in Appendix H of this document.
2 Locations that approach or exceed the noise abatement criteria require consideration of noise abatement measures. For residential land uses, 66 dBA is the level considered to approach the noise abatement criteria.


**CEQA Evaluation**

For the purpose of evaluating noise impacts under CEQA, year 2014 traffic noise levels were identified as the baseline and were compared with year 2040 predicted traffic noise levels to evaluate the potential for a substantial permanent increase in ambient noise levels in the project vicinity. Caltrans does not have a set standard for making this determination but requires the limit to be established for each project. An increase of 5 decibels between existing and design year with-project conditions was used for this project for evaluating noise impacts under
CEQA for both build alternatives. This standard was used due to the rural setting of the project area, the low number of residences affected, and the relatively low existing noise level.

A 5-decibel increase would only occur between existing and design year conditions under the Signalized Intersection Alternative at Receptor R2. However, this receptor location was used for noise monitoring purposes only; it is not a frequent outdoor use area. Neither build alternative would result in a 5-decibel increase at any frequent outdoor use areas; therefore, noise impacts under CEQA are not anticipated.

**No Build Alternative**

Future noise levels under the No Build Alternative would remain similar to existing noise levels (within 1 dB) and would not approach or exceed the noise abatement criteria, as shown in Table 2.2-9; therefore, no noise impacts would occur.

**Construction Impacts**

**Build Alternatives**

The impacts of both build alternatives would be the same as one another. During the construction phases of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction under both build alternatives. Table 2.2-10 summarizes noise levels produced by construction equipment commonly used on highway construction projects. As indicated, equipment involved in construction is expected to generate noise levels ranging from 80 to 89 dBA at a distance of 50 feet. Noise produced by construction equipment would be reduced over distance at a rate of approximately 6 decibels per doubling of distance.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Maximum Noise Level (A-weighted decibels at 50 feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scrapers</td>
<td>89</td>
</tr>
<tr>
<td>Bulldozers</td>
<td>85</td>
</tr>
<tr>
<td>Heavy Trucks</td>
<td>88</td>
</tr>
<tr>
<td>Backhoe</td>
<td>80</td>
</tr>
<tr>
<td>Pneumatic Tools</td>
<td>85</td>
</tr>
<tr>
<td>Concrete Pump</td>
<td>82</td>
</tr>
</tbody>
</table>

*Source: Federal Transit Administration, 2006.*

Temporary construction noise impacts would be unavoidable at areas located immediately adjacent to the proposed project alignment. In addition, it is possible that certain construction
activities could cause intermittent localized concern from vibration in the project area. Processes such as earth moving with bulldozers, the use of vibratory compaction rollers, or pavement breaking may cause construction-related vibration impacts such as human annoyance or, in some cases, minor architectural damage. There are cases where it may be necessary to use this type of equipment in close proximity to residential buildings; however, effective noise and vibration control during construction of a project means minimizing noise and vibration disturbances to the surrounding community. A combination of abatement techniques with equipment noise and vibration control and administrative measures would be selected to provide the most effective means to minimize effects of the construction activity on the surrounding community.

**No Build Alternative**
There would be no noise-related construction impacts under the No Build Alternative because construction activities would not occur.

### 2.2.7.4 Project Features, Avoidance, Minimization, and/or Abatement Measures

**Project-Level Avoidance, Minimization, and/or Abatement Measures**

Noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Potential noise abatement measures include the following:

- Construction of noise barriers, including acquisition of property rights, either within or outside the state ROW.
- Traffic management measures including, but not limited to, traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.
- Alteration of horizontal and vertical alignments (i.e., moving the location of the highway away from the sensitive land use or changing the elevation of the project).
- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development that would be adversely impacted by traffic noise.

A noise barrier is the only form of noise abatement considered for this project because the other potential noise abatement measures were not found to be practical. The noise barrier evaluated has been evaluated for feasibility based on an achievable noise reduction of 5 decibels or more. Caltrans’ acoustical design goal must also be met for a noise barrier to be considered reasonable. The design goal is that a barrier must be predicted to provide at least 7 decibels of noise reduction at one or more benefited receptors. In addition, the estimated cost to build the noise barrier should be equal to or less than the total cost allowance of benefited
receptors calculated for the barrier to be considered reasonable from a cost perspective. Furthermore, the viewpoints and opinions of the benefitted receptors must be considered for a barrier to be considered reasonable. For example, if a benefitted receptor does not want a barrier by their property, then the barrier may be considered not reasonable.

Because the noise abatement criterion was exceeded at one location, one noise barrier is analyzed. The analysis was conducted with barrier heights ranging from 6 to 16 feet. The barrier heights and locations were evaluated first to determine if a minimum 5-decibel noise reduction at the outdoor frequent use areas of the representative receptors could be achieved, then second, to determine if a minimum 7-decibel noise reduction at the receptor could be achieved. Table 2.2-11 summarizes the results of the noise barrier evaluation. The predicted noise levels are shown in the Noise Study Report (January 2016) and the Noise Abatement Decision Report (April 2016).

<table>
<thead>
<tr>
<th>Barrier Number/Alternative</th>
<th>Protected Receptor (Receptor Number)</th>
<th>Type of Benefited Land Uses¹</th>
<th>Barrier Height (feet)</th>
<th>Predicted 2040 Noise Levels with Barrier (dBA)</th>
<th>Barrier Insertion Loss (dB)</th>
<th>Number of Benefited Residences</th>
<th>Total Reasonable Allowance²</th>
</tr>
</thead>
<tbody>
<tr>
<td>S628/ Roundabout R15 SFR</td>
<td>6 63 4 N/A N/A</td>
<td>SFR</td>
<td>6</td>
<td>63</td>
<td>4</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>8 63 4 N/A N/A</td>
<td></td>
<td>8</td>
<td>62</td>
<td>5</td>
<td>1</td>
<td>$80,000</td>
</tr>
<tr>
<td></td>
<td>10 62 5 1 $80,000</td>
<td></td>
<td>12</td>
<td>60</td>
<td>7</td>
<td>1</td>
<td>$80,000</td>
</tr>
<tr>
<td></td>
<td>14 60 7 1 $80,000</td>
<td></td>
<td>14</td>
<td>59</td>
<td>8</td>
<td>1</td>
<td>$80,000</td>
</tr>
<tr>
<td>S628/ Signalized Intersection R15 SFR</td>
<td>6 63 4 N/A N/A</td>
<td>SFR</td>
<td>6</td>
<td>63</td>
<td>4</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>8 62 5 1 $80,000</td>
<td></td>
<td>8</td>
<td>62</td>
<td>5</td>
<td>1</td>
<td>$80,000</td>
</tr>
<tr>
<td></td>
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<td>10</td>
<td>60</td>
<td>5</td>
<td>1</td>
<td>$80,000</td>
</tr>
<tr>
<td></td>
<td>12 60 7 1 $80,000</td>
<td></td>
<td>12</td>
<td>59</td>
<td>8</td>
<td>1</td>
<td>$80,000</td>
</tr>
<tr>
<td></td>
<td>14 59 8 1 $80,000</td>
<td></td>
<td>14</td>
<td>59</td>
<td>8</td>
<td>1</td>
<td>$80,000</td>
</tr>
</tbody>
</table>

Notes:
1 Land Use: SFR – single-family residence.
2 Based on the base reasonable allowance of $80,000 per benefitted receptor.
N/A – Not Applicable

Under both build alternatives, Soundwall S628 would be located on the shoulder and would wrap along the entrance to Maffei Road along eastbound SR 121/Fremont Drive. This soundwall would provide feasible noise abatement for the outdoor use area of one single-family residence represented by Receptor R15. Soundwall S628 would also meet the design goal by providing a 7-decibel traffic noise reduction at Receptor R15. Under the Roundabout Alternative, a height of 10 to 16 feet would provide the required noise reduction, while a height of 8 to 16 feet would provide the required noise reduction under the Signalized Intersection Alternative.

Soundwall S628 was determined to be feasible by achieving a 5 decibel or more noise reduction and reasonable based on meeting Caltrans design goal criteria of providing at least 7 decibels of noise reduction; therefore, a cost reasonableness calculation has been completed for this wall, as shown in Table 2.2-12.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Height (feet)</th>
<th>Acoustically Feasible (5-dB)?</th>
<th>Type of Number of Benefited Land Uses</th>
<th>Design Goal Achieved (7-dB)?</th>
<th>Total Reasonable Allowance²</th>
<th>Estimated Construction Cost³</th>
<th>Cost Less than Allowance?</th>
</tr>
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<tbody>
<tr>
<td>Roundabout</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>No</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>No</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Yes</td>
<td>1 SFR</td>
<td>No</td>
<td>$80,000</td>
<td>$116,000</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Yes</td>
<td>1 SFR</td>
<td>Yes</td>
<td>$80,000</td>
<td>$135,000</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Yes</td>
<td>1 SFR</td>
<td>Yes</td>
<td>$80,000</td>
<td>$153,000</td>
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<tr>
<td></td>
<td>16</td>
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<td>Signalized Intersection</td>
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</tr>
<tr>
<td></td>
<td>6</td>
<td>No</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Yes</td>
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<td>No</td>
</tr>
<tr>
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<td>Yes</td>
<td>1 SFR</td>
<td>No</td>
<td>$80,000</td>
<td>$118,000</td>
<td>No</td>
</tr>
<tr>
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<td>No</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Yes</td>
<td>1 SFR</td>
<td>Yes</td>
<td>$80,000</td>
<td>$178,000</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes:
1 Land Use: SFR – single-family residence.
2 Based on the base reasonable allowance of $80,000 per benefited receptor.
3 Preliminary cost estimate is based on current costs at the time the cost estimates were prepared (2015).
N/A – Not Applicable

Based on preliminary estimates, Soundwall S628 can be considered not reasonable from a cost perspective because the construction cost estimate is greater than the reasonable cost allowance; therefore, Soundwall S628 would not be constructed under either build alternative.

**Construction Period Project Features, Avoidance, Minimization, and/or Abatement Measures**

Sound control shall conform to the provisions in Section 14-8.02, “Noise Control,” of the Caltrans Standard Specifications and 14-8.02, “Noise Control,” of the Standard Special Provisions. According to requirements of these specifications, construction noise cannot exceed 86 dBA at 50 feet from the jobsite activities from 9:00 p.m. to 6:00 a.m. In addition, the following project features and control measures will be implemented to minimize noise disturbances at sensitive receptors during periods of construction:

- **PF NOI-1:** Noise monitoring, conducted by Caltrans, will ensure that contractors take all reasonable steps to minimize impacts when near sensitive areas.
- **PF NOI-2:** Noise testing and inspection of equipment by the contractor will ensure that all equipment onsite is working properly, in good condition, and effectively muffled. All equipment will have sound-control devices no less effective than those provided on the original equipment. Each internal combustion engine used for any purpose on the job or related to the job shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine should be operated on the jobsite without an appropriate muffler. Idling equipment will be turned off.
- **AMM NOI-3:** An active community liaison program will be established, which will keep residents informed about construction plans so they can plan around periods of particularly high noise or vibration levels, and allow for a conduit for residents to express any concerns or complaints.
- **AMM NOI-4:** Truck loading, unloading, and hauling operations will be minimized so that noise and vibration are kept to a minimum through the study area to the greatest possible extent.
- **AMM NOI-5:** Where feasible, temporary noise barriers should be used and relocated, as needed, to protect sensitive receptors against excessive noise from construction activities involving large equipment and by small items such as compressors, generators, pneumatic (air-powered) tools, and jackhammers. Noise barriers can be made of heavy plywood, moveable insulated sound blankets, or other best available control techniques.
- **PF NOI-6:** Construction activities should be minimized in the study area during evening, nighttime, weekend, and holiday periods. Noise impacts are typically minimized when construction activities are performed during daytime hours; however, nighttime construction may be desirable (e.g., in commercial areas where businesses may be disrupted during daytime hours) or necessary to avoid major traffic disruption.
The following are some procedures that can be used to minimize the potential impacts from construction vibration:

- **PF NOI-7**: Restrict the hours of vibration-intensive equipment or activities such as vibratory rollers so that impacts to study area users are minimal (e.g., restrict the hours to weekdays during daytime hours).

- **AMM NOI-8**: The owner of a building close enough to a construction vibration source that damage to that structure due to vibration is possible would be entitled to a preconstruction building inspection to document the preconstruction condition of that structure.

- **AMM NOI-9**: Conduct vibration monitoring during vibration-intensive activities.
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

2.3 Biological Environment

2.3.1 Natural Communities

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 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. One regulation, State Senate Concurrent Resolution No. 17, is relevant to the oak woodlands discussed in this section.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in Section 2.3.5, Threatened and Endangered Species. Wetlands and other waters are also discussed below in Section 2.3.2.

2.3.1.1 Affected Environment

The following is summarized from the Natural Environment Study (October 2017). A general reconnaissance of the study area, shown in Figure 2.3-1, was conducted on April 1, 2014, by project biologists. Additionally, botanical and wildlife surveys were conducted on February 11 and May 15, 2015, and tree surveys were conducted on April 9 and 14 and May 15, 2015. The study area is 70.74 acres and includes seven vegetation communities: urban, landscaped, vineyard, annual grassland, eucalyptus, fresh emergent wetland, and riverine. No critical habitat or wildlife corridors are present within the study area.

The urban habitat consists of primarily paved area and includes the Park and Ride lot and commercial areas in the southwest quadrant of the study area. Urban habitat environments are unlikely to provide suitable habitat for special-status plants due to disturbed soil conditions and the predominance of exotic landscape species that successfully out-compete native vegetation for resources such as space, nutrients, and water. Wildlife, especially urban-adapted species such as squirrel (Sciurus sp.) and Virginia opossum (Didelphis virginiana), could use the paved areas and the highways to travel between habitats.

Landscaped areas include roadsides and planted strips in front of the businesses to the northwest and southeast of the intersection. Several species of trees line the highway and include non-native and domesticated species such as eucalyptus (Eucalyptus sp.), plum (Prunus domestica), and olive (Olea europaea). Oak and other native trees in the area are planted landscape trees rather than remnant native vegetation. The landscaped tree areas could provide foraging, roosting, and nesting habitat for birds, bats, and other wildlife.
Figure 2.3-1: Habitat Types in the Study Area
Vineyards are present in and adjacent to the study area. Special-status wildlife species may forage in vineyards; however, they do not typically provide sufficient cover for breeding and protection from predators. Several species could occur adjacent to vineyard habitat, including acorn woodpecker (*Melanerpes formicivorus*), northern flicker (*Colaptes auratus*), and western scrub-jay (*Aphelocoma californica*). Special-status plant species are unlikely to occur in the vineyards due to intensive management practices and proximity to active highways and other urban habitat.

Two areas of annual grassland habitat are present within the study area – one as part of a larger field to the northeast of the intersection and one adjacent to vineyards to the southwest of the intersection. Annual grassland provides foraging, breeding, and resting areas for a wide variety of birds, mammals, and reptiles, such as brewer’s blackbird (*Euphagus cyanocephalus*), western meadowlark (*Sturnella neglecta*), and northern mockingbird (*Mimus polyglottos*).

Numerous eucalyptus trees grow within the study area and, in some cases, are associated with small eucalyptus groves beyond the study area. Eucalyptus trees, although not native to the U.S., provide roost, nest, and perch sites for raptors (including special-status wildlife species such as white-tailed kite (*Elanus leucurus*)), and migratory and non-game birds (protected by the Migratory Bird Treaty Act). Eucalyptus habitat in the study area is shown in Figure 2.3-1. Most eucalyptus species (including those onsite) produce allelopathic chemicals that inhibit the growth of other plant species. Allelopathy is a biological phenomenon by which an organism produces one or more biochemicals that influence the germination, growth, survival, and reproduction of other organisms. It is not likely that special-status plants could occur within the eucalyptus habitat type due to the suppression of growth from the trees. The eucalyptus trees provide suitable nesting habitat for raptors and non-game birds.

Wetland habitat is present within the study area; this is discussed further in Section 2.3.2, Wetlands and Other Waters of the United States. Vernal pools are also known to occur in the region to the west but outside of the study area. Vernal pools serve as important habitat for threatened or endangered wildlife, including California tiger salamander (*Ambystoma californiense*), vernal pool fairy shrimp (*Branchineta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), various plants, including Sonoma sunshine (*Blennosperma bakeri*) and Contra Costa goldfields (*Lasthenia conjugens*). There is low potential for vernal pool habitat in the field northeast of the intersection.

Due to the potential for wetlands in the study area, vernal pool habitat could also occur in the field northeast of the intersection. While potential for their presence is considered low due to the occurrence of abundant invasive vegetation in the northeast parcel, they cannot be ruled out until surveys are completed after obtaining/gaining access to the property. All U.S. Army Corps of Engineers jurisdictional wetlands acreages presented in this document are estimates based on the wetlands delineation. The U.S. Army Corps of Engineers issued a preliminary
jurisdictional determination in November 2016. Once access is granted to the property during the permitting phase, a new field delineation will be made and a U.S. Army Corps of Engineers jurisdictional determination will be requested by Caltrans.

Yellow Creek, a riverine habitat, is an intermittent stream originating in the mountain ranges on the west side of Sonoma Valley flowing into the study area and then into Sonoma Creek approximately 1.19 miles southeast of the study area and ultimately to San Pablo Bay. Riverine habitat was also identified within a small roadside channel situated along the north side of Bonneau Road, which flows west to east and is a tributary to Yellow Creek. Although this drainage feature may have been installed to function as a roadside ditch, erosion has caused it to widen, and a distinct bed, bank, and channel has formed, making it a jurisdictional feature. During the wetland delineation, it was determined that 0.45 acre of Yellow Creek (1,050 linear feet) and 0.06 acre of a tributary to Yellow Creek (860 linear feet) are waters of the U.S. that lie within the study area but which are outside of the project footprint. The waters of the U.S. in the study area receive water throughout the year from agricultural runoff, as well as from rain events.

Plants observed within the study area along Yellow Creek consisted primarily of non-native species, including common wild oats (Avena fatua), black mustard (Brassica nigra), wild radish (Raphanus raphanistrum), field marigold (Calendula arvensis), Italian thistle (Carduus pycnocephalus), and eucalyptus. Small populations of native vegetation consisted of coyote brush (Baccharis pilularis), coast live oak (Quercus agrifolia), and common bedstraw (Galium aparine). A variety of birds and raptors were also observed in this habitat.

2.3.1.2 Environmental Consequences

As a result of preparations for agency consultation made between circulation of the Draft Environmental Document and preparation of the Final Environmental Document, impacts to natural communities have changed, as discussed in the analysis below.

Project-Level Impacts

Build Alternatives

The impacts of both build alternatives would be very similar to one another. Both build alternatives would require tree removal due to the expansion and reconfiguration of the highways. As shown in Table 2.3-1, of the 227 individual trees mapped within the study area, approximately 36 native and 74 non-native trees would be removed under the Roundabout Alternative, while 49 native and 89 non-native trees would be removed under the Signalized Intersection Alternative. Native trees affected would include coast live oak, valley oak (Q. lobata), sycamore (Plantanus racemosa), and redwood (Sequoia sempervirens). The average size of the trees to be removed under both build alternatives is 15.3 inches in diameter at breast height.
Table 2.3-1: Tree Removal

<table>
<thead>
<tr>
<th>Tree Species</th>
<th>Roundabout Alternative Impacts</th>
<th>Signalized Intersection Alternative Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trees Impacted (Permanent)</td>
<td>Impact Location*</td>
</tr>
<tr>
<td>Total Native</td>
<td>36</td>
<td>Northeast quadrant</td>
</tr>
<tr>
<td>Non-native</td>
<td>65</td>
<td>Northeast quadrant</td>
</tr>
<tr>
<td>Non-native</td>
<td>5</td>
<td>Southeast quadrant</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>2</td>
<td>Southwest quadrant</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>2</td>
<td>Northeast quadrant</td>
</tr>
<tr>
<td>Total Non-natives</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td>Total Impacts</td>
<td>110</td>
<td></td>
</tr>
</tbody>
</table>

Impact location relative to SR 116/121 intersection centerline.  
Note: While eucalyptus are non-native species, these trees are large enough to be potential nesting habitat for raptors and are tracked separately from other smaller non-native trees.

The project would also permanently impact habitat within the study area. Impacts per habitat type are shown in Table 2.3-2. The Roundabout Alternative would permanently impact 8.76 acres of urban habitat, 3.09 acres of landscaped habitat, 1.77 acres of annual grassland, 0.06 acre of eucalyptus habitat, and 1.50 acre of wetlands, for a total of 15.18 acres. The Signalized Intersection Alternative would permanently impact 10.14 acres of urban habitat, 3.57 acres of landscaped habitat, 0.02 acre of annual grassland, 0.10 acre of eucalyptus habitat, and 1.53 acres of wetlands, for a total of 15.36 acres. Permanent impacts under both alternatives would result from expansion of the highway to accommodate additional lanes, shoulders, Park and Ride lot, and pedestrian and bicycle facilities.

Table 2.3-2: Permanent and Temporary Impacts to Habitat by Type

<table>
<thead>
<tr>
<th>Habitat Type</th>
<th>Roundabout Alternative Impacts (Acreage)</th>
<th>Signalized Intersection Alternative Impacts (Acreage)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Permanent</td>
<td>Temporary</td>
</tr>
<tr>
<td>Urban</td>
<td>8.76</td>
<td>0.41</td>
</tr>
<tr>
<td>Landscaped</td>
<td>3.09</td>
<td>0.08</td>
</tr>
<tr>
<td>Vineyard</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Annual Grassland</td>
<td>1.77</td>
<td>1.16</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>0.06</td>
<td>0.08</td>
</tr>
<tr>
<td>Fresh Emergent Wetland</td>
<td>1.50</td>
<td>0</td>
</tr>
<tr>
<td>Riverine</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>15.18</td>
<td>1.73</td>
</tr>
</tbody>
</table>
Neither build alternative would impact Yellow Creek or its tributary within the study area because the limits of construction are not within any stream corridors. No wildlife corridors or fish passages would be affected.

**No Build Alternative**
The No Build Alternative would not affect natural communities because no highway improvements would occur.

**Construction Impacts**

**Build Alternatives**
The impacts of both build alternatives would be very similar to one another. Both alternatives would have temporary impacts to trees during construction, including minor pruning or trimming of branches and cutting of minor root systems.

Construction activities, such as land clearing, grading/excavation, and paving, and the installation of retention basins would temporarily impact 0.41 acre of urban habitat, 0.08 acre of landscaped habitat, 1.16 acres of annual grassland, and 0.08 acre of eucalyptus habitat, for a total of 1.73 acres under the Roundabout Alternative, as shown above in Table 2.3-2. The Signalized Intersection Alternative would temporarily impact 0.40 acre of urban habitat, 0.22 acre of landscaped habitat, 1.80 acres of annual grassland, 0.03 acre of eucalyptus habitat, and 0.21 acre of wetland habitat, for a total of 2.66 acres.

**No Build Alternative**
The No Build Alternative would not affect natural communities because no construction activities would occur.

### 2.3.1.3  Project Features, Avoidance, Minimization, and/or Mitigation Measures

The following project features and mitigation measure will be implemented:

- **PF NC-1**: Existing native vegetation will be preserved to the greatest extent feasible, and new landscaping will be planted within the ROW where feasible. Specific trees to be preserved will be identified during the permitting phase of the project.

- **MM NC-2**: It is expected that replanting of oak trees will occur at least 1:1 ratio (i.e., replacement of one native oak for every one removed). Replacement of other native trees will be replaced at least 1:1 ratio. Replacement planting would occur onsite; a tree planting plan utilizing native trees would be developed.

- **PF NC-3**: Protect Environmentally Sensitive Areas: Environmentally Sensitive Areas will be delineated on the project plans and confirmed by the Caltrans Biologist prior to construction. In addition, the project limits will be delineated with high-visibility fencing to avoid ground disturbance adjacent to work and access areas and to prevent access to the work site from nonauthorized personnel. Trees will be preserved in place to the extent
practicable, potentially with delineation of an Environmentally Sensitive Area. All spoils, excavated materials, and plant materials will be disposed of at a licensed and approved facility.

- **PF NC-4: Implement Erosion Control Measures and Stormwater Pollution Prevention Plans:** Stormwater Pollution Prevention Plans and erosion control best management practices will be developed to minimize any wind- or water-related erosion. The Stormwater Pollution Prevention Plans provide guidance for design staff to include measures to protect sensitive areas and to prevent and minimize stormwater and non-stormwater discharges. Protective measures will include, but are not limited to, these restrictions:
  - No discharge of pollutants from vehicle and equipment cleaning will be allowed into any storm drains or watercourses.
  - Vehicle and equipment fueling and maintenance operations will be at least 50 feet away from watercourses, except at established commercial gas stations or established vehicle maintenance facility.
  - Dust control will include use of water trucks and dust palliatives to control dust in excavation and fill areas and covering temporary stockpiles when weather conditions require.
  - Biodegradable coir rolls or straw wattles will be installed following Caltrans Best Management Practices Manual, Caltrans Standard Specifications, and language in the project Stormwater Pollution Prevention Plan. No erosion control items containing monofilament netting of any kind may be used on the project site.
  - Graded areas will be protected from erosion using a combination of silt fences, biodegradable fiber rolls along edges of designated staging areas, and biodegradable erosion control netting (e.g., jute or coir) as appropriate on sloped areas.

- **PF NC-5: Replant, Reseed, and Restore Disturbed Areas:** Upon completion of sediment removal activities (removal of sediments from water or stormwater), disturbed areas will be restored. All slopes or unpaved areas temporarily affected by the proposed project will be stabilized with effective erosion control materials. Slopes and bare ground will be re-seeded with native grasses, including narrowleaf milkweed, to stabilize and prevent erosion. Where temporary disturbance includes the removal of trees or plants, native species will be replanted. Revegetated and replanted areas will be monitored and maintained under a plant establishment plan for a period of 3 years.

- **PF NC-6: Provide Environmental Awareness Training:** Before the onset of construction, a qualified biologist will conduct an education program for all project personnel. The program will include information on the protected species and their habitats likely to be found within the study area; requirements of federal and State laws pertaining to these species; identification of measures implemented to conserve the species and
habitat within the project area; and distribution of a fact sheet conveying this information to the personnel who may enter the study area.

- **PF NC-7: Implement Project Site Best Management Practices:**
  - Access routes and the number and size of staging and work areas will be limited to existing paved surfaces as practicable. Routes and boundaries will be clearly marked prior to initiating ground disturbance.
  - All food and food-related trash items will be enclosed in sealed trash containers and removed completely from the site at the end of each day.
  - No pets from project personnel will be allowed anywhere in the study area during work.
  - All equipment will be maintained such that there will be no leaks of automotive fluids, such as gasoline, oils, or solvents, and a Spill Response Plan will be prepared.
  - Hazardous materials, such as fuels, oils, and solvents, will be stored in sealable containers in a designated location that is at least 100 feet from aquatic habitats.

- **PF NC-8: Implement Project Schedule Windows:**
  - A qualified biologist will conduct a preconstruction survey no less than 3 days before any ground-disturbing activities occur.
  - For protected resources and species, sediment removal actions will be scheduled to avoid effects on listed species and habitats to the extent practicable.
  - Work near trees that are to be preserved will be limited to times when soils are dry.

### 2.3.2 Wetlands and Other Waters of the United States

#### 2.3.2.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (33 U.S.C. 1344), is the primary law regulating wetlands and surface waters. One purpose of the Clean Water Act is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. 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 formed during 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 discharge of dredged or fill material cannot 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 U.S. Army Corps of Engineers with oversight by the U.S. Environmental Protection Agency.
The U.S. Army Corps of Engineers issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of the U.S. Army Corps of Engineers’ Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the U.S. Army Corps of Engineers decision to approve is based on compliance with U.S. Environmental Protection Agency’s Section 404(b)(1) Guidelines (EPA 40 CFR Part 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. Environmental Protection Agency in conjunction with the U.S. Army Corps of Engineers and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the U.S. Army Corps of Engineers may not issue a permit if there is an LEDPA to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences.

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 Federal Highway Administration and/or Caltrans, as assigned, 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. A Wetlands Only Practicable Alternative Finding must be made.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board, the Regional Water Quality Control Boards, and the California Department of Fish and Wildlife. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or Tahoe Regional Planning Agency) 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 California Department of Fish and Wildlife before beginning construction. If the California Department of Fish and Wildlife determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. California Department of Fish and Wildlife 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 U.S. Army
Corps of Engineers may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the California Department of Fish and Wildlife.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements and may be required even when the discharge is already permitted or exempt under the Clean Water Act. In compliance with Section 401 of the Clean Water Act, the Regional Water Quality Control Boards also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see Section 2.2.2, Water Quality and Stormwater Runoff, for additional details.

2.3.2.2 Affected Environment

The following is summarized from the *Delineation of Waters of the U.S.* (March 2016) and the *Natural Environment Study* (October 2017). A preliminary jurisdictional determination was made for the project by the U.S. Army Corps of Engineers on November 28, 2016. Caltrans’ Annotated Outline guidance notes that an approved jurisdictional determination should be used for projects that will require a Standard (Individual) Permit or are likely to be contested in court for issues related to the delineation. For projects that require an approved jurisdictional determination, a verified jurisdictional determination is required for the Final Environmental Document. Due to the inability to access the northeastern quadrant of land, the project, in this case, will proceed to the Final Environmental Document with a verified preliminary jurisdictional determination. Coordination between Caltrans and U.S. Army Corps of Engineers indicates the only option is to proceed with the verified preliminary jurisdictional determination map submitted in March 2016. As stated in U.S. Army Corps of Engineers guidance, an approved jurisdictional determination cannot be issued until field verification of jurisdictional features has been completed. U.S. Army Corps of Engineers will complete field verification of jurisdictional features as part of an approved jurisdictional determination once access to the parcel of land in the northeast quadrant is granted.

In accordance with the methods defined by the U.S. Army Corps of Engineers *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (which is the applicable supplement for the study area), reference materials were reviewed prior to initiating field surveys, including the *Soil Survey of Sonoma County* (U.S. Department of Agriculture, 1972); the Sonoma, Napa, Petaluma River, Novato, Glen Ellen, Cuttings Wharf, Petaluma Point, and Mare Island U.S. Geological Survey 7.5' quadrangle maps; the *National Wetlands Inventory* (U.S. Fish and Wildlife Service, 2014); soil survey mapping; and historical and current aerial photos of the study area. Wetland delineations were conducted throughout the study area except for the parcel of land northeast of the intersection due to property owner restrictions. The accessible portions of the study area were field
evaluated for potential wetland features utilizing the presence or absence of indicators of the three wetland parameters on February 11, 2015. Potential jurisdictional features for this parcel were identified using historical aerial imagery and direct visual observations from outside of the property limits during field visits in April 2014 and February 2015.

The field and aerial delineation identified approximately 9.03 acres of potential waters of the U.S. within the study area, including 8.52 acres of wetlands and 0.51 acre of other waters (Yellow Creek and its tributary), which can be seen in Table 2.3-3 and Figure 2.3-2. These acreages are a best conservative estimate based on the fact that most of the wetlands were delineated using aerial imagery and visual observations.

**Table 2.3-3: Potential Existing Jurisdictional Features in the Study Area**

<table>
<thead>
<tr>
<th>Potential Jurisdictional Features</th>
<th>Size (acres)</th>
<th>Length (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential Waters of the U.S. (Wetlands)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property Southwest of Bonneau Road/SR 121 Intersection (field delineation)</td>
<td>0.29</td>
<td>--</td>
</tr>
<tr>
<td>Property Northeast of SR 116/121 Intersection (aerial delineation)</td>
<td>8.23</td>
<td>--</td>
</tr>
<tr>
<td><strong>Total Potential Jurisdictional Wetlands</strong></td>
<td><strong>8.52</strong></td>
<td>--</td>
</tr>
<tr>
<td><strong>Potential other Waters of the U.S.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow Creek Tributary (field delineation)</td>
<td>0.06</td>
<td>860</td>
</tr>
<tr>
<td>Yellow Creek (field delineation)</td>
<td>0.45</td>
<td>1,050</td>
</tr>
<tr>
<td><strong>Total Potential Jurisdictional Other Waters</strong></td>
<td><strong>0.51</strong></td>
<td><strong>1,910</strong></td>
</tr>
<tr>
<td><strong>Total Potential Jurisdictional Area</strong></td>
<td><strong>9.03</strong></td>
<td><strong>1,910</strong></td>
</tr>
</tbody>
</table>


Within the property southwest of the intersection, a potential wetland of 0.29 acre was delineated. The field is bounded by Yellow Creek to the west and south, a residential house and commercial properties to the north, SR 121 to the east, and vineyards to the south. This area primarily receives water through roadside runoff and potential flood waters from Yellow Creek during high rain events.
Figure 2.3-2: Potential Jurisdictional Features in the Study Area
Within the inaccessible northeast parcel of the study area, 8.23 acres of wetlands were mapped using historical aerial imagery. The U.S. Army Corps of Engineers advises using additional data when an onsite delineation cannot be made. A preliminary hydrophytic-vegetation determination for the inaccessible northeastern parcel was made by examining the data sources and reference materials noted above, in addition to notes and photographs taken during field visits, Federal Emergency Management Agency flood maps, surface water flow patterns maps from Caltrans’ Watershed Planning Tool, and contour elevation data from Sonoma County’s Vegetation and LiDAR program. Vernal pool habitat may occur in the field based on observed wetland features and review of known vernal pool features in the area. While potential of their presence is considered low due to the occurrence of abundant invasive vegetation in the northeast parcel, they cannot be ruled out until surveys are completed following access to the property.

Caltrans and SCTA will complete field verification of the jurisdictional features as part of an approved U.S. Army Corps of Engineers jurisdictional determination once access to the parcel of land is granted. It is anticipated that wetland boundaries will change once wetland delineations are performed.

Other waters of the U.S. in the study area include 0.45 acre of Yellow Creek and approximately 0.06 acre of a tributary to Yellow Creek. These areas contained a defined creekbed and creekbank, with distinct indicators of regular water flow. Visible signs of high flows were also observed, such as vegetation movement, scouring, and debris litter.

### 2.3.2.3 Environmental Consequences

Section 1.7, Alternatives Considered but Eliminated from Further Consideration, provides information on other alternatives that were considered and evaluated for feasibility. Avoidance alternatives for wetlands are discussed in Appendix J, Least Environmentally Damaging Practicable Alternative Analysis. These sections discuss how and why impacts to wetlands cannot be avoided.

#### Project-Level Impacts

**Build Alternatives**

The impacts of both build alternatives would be very similar to one another. Direct impacts to Yellow Creek or its tributary would not occur under either build alternative because it is located 183 feet south of the project limits under the Signalized Intersection Alternative and 217 feet south under the Roundabout Alternative. Best Management Practices, described in Section 2.2.2.4, will be implemented to protect Yellow Creek and its tributary from project impacts such as runoff from construction activities.

Both build alternatives would have permanent impacts to waters of the U.S. (wetlands) and, based on estimated impact acreage, would require a Section 404 Standard Individual Permit from
the U.S. Army Corps of Engineers. All potential U.S. Army Corps of Engineers jurisdictional features would also be considered waters of the State and would require a Section 401 permit from the Regional Water Quality Control Board. These permits will be obtained during the design phase of the project. Coordination with the U.S. Army Corps of Engineers occurred after the Draft Environmental Document was circulated to the public to verify the preliminary jurisdictional determination. Further coordination will be required once access to the property in the northeast quadrant is granted. This is further discussed in Chapter 3, Section 3.1.2.

The potential functions and values of accessible wetlands were evaluated based on the Wetland Evaluation Technique developed by the U.S. Army Corps of Engineers and the Federal Highway Administration (Adamus et al., 1987). According to Executive Order 11990, Protection of Wetlands, wetland functions and values are determined by their ability to provide water quality improvements, sediment retention, groundwater recharge and discharge, flood storage, production of fauna and flora, recreation, scientific advancement, and cultural benefits, in addition to traditional fish and wildlife habitat functions.

According to the evaluation technique, a wetland is rated on a scale of low, moderate, or high with regard to its processes and interactions with the other functions; these ratings are given a numerical value of 1 (low), 2 (moderate), or 3 (high). A wetland can have a total function and value score from a low of 11 (a wetland with the least function and value) to a high of 33 (a wetland with the highest function and value). The functions and values for the wetlands in the study area can be seen in Tables 2.3-4 and 2.3-5 and were made using best professional judgment. The property in the northeast quadrant was inaccessible at the time that the evaluation was conducted; however, direct visual observations were made from outside of the property limits. Ratings for wetlands in the northeast quadrant could change pending field verification.

The wetlands delineated on February 11, 2015, scored a rating of 11 in the southwest quadrant and 15 in the northeast quadrant. This is below the mid-range, which would indicate that the overall functions and values of the wetlands in the southwest and northeast quadrants of the intersection are low. These ratings are attributed to the frequent disturbance (assumed leach field in the southwest and mowing and tilling in the northeast) that occurs in these areas. The impacts associated with both build alternatives could potentially affect the functions and values of the wetlands, as shown in Tables 2.3-4 and 2.3-5, by:

- Reducing groundwater recharge related to wetlands in the northeast and southwest quadrants;
- Increasing flood-flow;
- Reducing sediment and nutrient retention areas;
- Reducing the diversity and/or abundance of aquatic species habitat through the loss of wetlands; and
• Reducing uniqueness or potential habitat for special-status species through loss and degradation of uniqueness or potential habitat.

The Roundabout Alternative is anticipated to result in permanent impacts to 1.50 acres of wetlands, as shown in Table 2.3-6 and Figure 2.3-3. This would be due to the relocation of the existing Park and Ride lot and the expansion of the highway to accommodate additional lanes, shoulders, and pedestrian and bicycle facilities. The Roundabout Alternative would not have any temporary impacts on wetlands or other waters of the U.S.

The Signalized Intersection Alternative was estimated to result in permanent impacts to 1.53 acres of wetlands, as shown in Table 2.3-6 and Figure 2.3-4. This would be due to the expansion of the highway to accommodate additional lanes, shoulders, and pedestrian and bicycle facilities and because the impact area extends farther north and east under this alternative. This alternative would not affect other waters of the U.S., but it would temporarily impact 0.21 acre of wetlands due to utility pole relocation activities. These temporary impacts would not impact the quality or functions of the wetlands because the impact is temporary, less than one year in duration, and the temporarily impacted portion of the wetland would be restored after construction is complete.

<table>
<thead>
<tr>
<th>Function and Value</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater Recharge</td>
<td>Low (1)</td>
<td>The wetland provides very little groundwater recharge.</td>
</tr>
<tr>
<td>Groundwater Discharge</td>
<td>Low (1)</td>
<td>No evidence of groundwater discharge from springs or other aquifers.</td>
</tr>
<tr>
<td>Flood-flow Alteration</td>
<td>Low (1)</td>
<td>During heavy precipitation events, outflow is less than inflow, with very little inflow.</td>
</tr>
<tr>
<td>Sediment Stabilization</td>
<td>Low (1)</td>
<td>Vegetation within the wetlands provides minimal soil stabilization, along with the area being regularly mowed.</td>
</tr>
<tr>
<td>Sediment/Toxicant Retention</td>
<td>Low (1)</td>
<td>Vegetation within the wetlands provides minimal sediment and toxicant retention capabilities during heavy precipitation events due to the frequent maintenance that occurs.</td>
</tr>
<tr>
<td>Nutrient Removal/Transformation</td>
<td>Low (1)</td>
<td>Vegetation within the wetlands provides minimal nutrient retention capabilities during heavy precipitation events.</td>
</tr>
<tr>
<td>Production Export</td>
<td>Low (1)</td>
<td>The wetlands provide low production export (flushing of organic material).</td>
</tr>
<tr>
<td>Wildlife Diversity/Abundance</td>
<td>Low (1)</td>
<td>The wetlands provide low wildlife diversity, even when it contains water. Species could include birds, amphibians, and reptiles; however, the frequent disturbance of this area reduces the potential for long-term use.</td>
</tr>
</tbody>
</table>
### Table 2.3-4: Potential Wetland Functions and Values
#### Southwest Quadrant

<table>
<thead>
<tr>
<th>Function and Value</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Diversity/Abundance</td>
<td>Low (1)</td>
<td>The wetland provides low diversity for aquatic species, based on the routine disturbance of this area.</td>
</tr>
<tr>
<td>Recreation</td>
<td>Low (1)</td>
<td>The wetland does not provide any recreational use because it is located on private property.</td>
</tr>
<tr>
<td>Uniqueness/Heritage</td>
<td>Low (1)</td>
<td>No special-status species have been observed, and the frequent disturbance of this area reduced the potential for special-status plants and animals to inhabit the wetlands.</td>
</tr>
<tr>
<td>Total Numerical Rating</td>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

### Table 2.3-5: Potential Wetland Functions and Values
#### Northeast Quadrant

<table>
<thead>
<tr>
<th>Function and Value</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater Recharge</td>
<td>Moderate (2)</td>
<td>Based on soil type and drainage classification information from the U.S. Geological Survey, the natural drainage class is moderately well drained, with alluvium soils derived from sedimentary rocks. The project's Water Quality Assessment Report identified groundwater depth as approximately 10 to 20 feet below ground surface suggesting or indicating these potential wetlands are not significantly contributing to groundwater recharge based on the identified depth. For this reason, the wetlands in the northeast quadrant were ranked “moderate” for groundwater recharge.</td>
</tr>
<tr>
<td>Groundwater Discharge</td>
<td>Low (1)</td>
<td>No evidence of groundwater discharge from springs or other aquifers.</td>
</tr>
<tr>
<td>Flood-flow Alteration</td>
<td>Moderate (2)</td>
<td>During heavy precipitation events, water outflow is less than inflow. Based on field visits during the rainy season, very little water flows through the field in the northeast quadrant and into the closest culvert. Most of the water ponds within the field and along the fence line where soil disturbance has occurred.</td>
</tr>
<tr>
<td>Sediment Stabilization</td>
<td>Low (1)</td>
<td>Vegetation within the wetlands provides moderate soil stabilization; however, portions of the site are regularly tilled for fire control suggesting a lower rating is appropriate.</td>
</tr>
<tr>
<td>Sediment/Toxicant Retention</td>
<td>Moderate (2)</td>
<td>Vegetation within the wetlands provides moderate sediment and toxicant retention capabilities during heavy precipitation events.</td>
</tr>
</tbody>
</table>
Table 2.3-5: Potential Wetland Functions and Values
Northeast Quadrant

<table>
<thead>
<tr>
<th>Function and Value</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrient Removal/Transformation</td>
<td>Moderate (2)</td>
<td>Vegetation within the wetlands provides moderate nutrient retention capabilities during heavy precipitation events.</td>
</tr>
<tr>
<td>Production Export</td>
<td>Low (1)</td>
<td>The wetlands provide low production export (flushing of organic material).</td>
</tr>
<tr>
<td>Wildlife Diversity/Abundance</td>
<td>Low (1)</td>
<td>The wetlands provide low wildlife diversity, even when they contain water. Species could include birds, amphibians, and reptiles; however, the frequent disturbance of these areas reduces the potential for long-term use. Based on site visit observations, the field is mowed and grazed with tilling occurring along the fence line of the property. These functions and values were rated low because observations from the roadside visual evaluation indicated that ponding within the middle of the field did not appear to persist long enough for developing amphibian breeding habitat, and the disturbances mentioned above also reduce long-term use of species.</td>
</tr>
<tr>
<td>Aquatic Diversity/Abundance</td>
<td>Low (1)</td>
<td>The wetlands provide low diversity for aquatic species, based on the routine disturbance of these areas.</td>
</tr>
<tr>
<td>Recreation</td>
<td>Low (1)</td>
<td>The wetlands do not provide any recreational use. The wetlands are located on private property.</td>
</tr>
<tr>
<td>Uniqueness/Heritage</td>
<td>Low (1)</td>
<td>No special-status species have been observed, and the frequent disturbance of these areas reduced the potential for special-status plants and animals to inhabit the wetlands.</td>
</tr>
<tr>
<td>Total Numerical Rating</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.3-6: Potential Jurisdictional Impacts within the Study Area

<table>
<thead>
<tr>
<th>Waters of the U.S. (Wetland) Impact</th>
<th>Roundabout Alternative Impacts (Acreage)</th>
<th>Signalized Intersection Alternative Impacts (Acreage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent</td>
<td>1.50</td>
<td>1.53</td>
</tr>
<tr>
<td>Temporary</td>
<td>0</td>
<td>0.21</td>
</tr>
<tr>
<td>Total</td>
<td>1.50</td>
<td>1.74</td>
</tr>
</tbody>
</table>

1 Affected wetlands are under the jurisdiction of the U.S. Army Corps of Engineers, State Water Resources Control Board, and Regional Water Quality Control Board.

Figure 2.3-3: Potential Jurisdictional Impacts – Roundabout Alternative
Figure 2.3-4: Potential Jurisdictional Impacts – Signalized Intersection Alternative
Permanent wetland impacts associated with the build alternatives consist of, but are not limited to, placing fill, such as pavement or asphalt, within wetlands, which would physically eliminate some wetlands and degrade the functions and values of the remaining wetlands. Compensatory mitigation for wetland impacts, described in MM WL-1, can be carried out by purchasing mitigation bank wetland credits at a bank in the region or by contributing funds to a U.S. Army Corps of Engineers-approved wetland restoration project in the region. The anticipated cost of mitigating for wetlands impacts is approximately $2.4 million for each build alternative. The functions and habitats at the offsite mitigation bank or restoration project would be similar to the existing functions and habitats in the impacted wetlands. Success criteria for determining if the mitigation is successful would be developed after access is obtained to the northeast parcel, so that the quality and functions of those wetlands can be evaluated.

Vernal pool habitat and the vernal pool fairy shrimp could be present within these wetlands. Their presence is assumed in this area until surveys can confirm presence or absence. This is further discussed in Section 2.3.5.3.

**No Build Alternative**
The No Build Alternative would not impact wetlands or other waters of the U.S. because no highway improvements would occur.

**Construction Impacts**

**Build Alternatives**
The Roundabout Alternative would not have any temporary impacts on wetlands or other waters of the U.S. The Signalized Intersection Alternative would also not affect other waters of the U.S., but it would temporarily impact 0.21 acre of wetlands. Temporary impacts would be due to utility pole relocation activities. These temporary impacts under the Signalized Intersection Alternative would not impact the quality or functions of the wetlands because the impact is temporary in nature (less than 1 year in duration) and the temporarily impacted portion of the wetland would be restored after construction is complete.

**No Build Alternative**
The No Build Alternative would not impact wetlands or other waters of the U.S. because construction activities would not occur.

**Least Environmentally Damaging Practicable Alternative Identification**
The following section summarizes the analysis presented in Appendix J, Least Environmentally Damaging Practicable Alternative Analysis.
Regulations Summary
The Preferred Alternative would impact wetlands and, due to estimated impact acreage of 1.50 acres, would require a Clean Water Act Section 404 Standard Individual Permit from the U.S. Army Corps of Engineers. Section 404 guidelines specify that a permit can be issued for a discharge of dredged or fill material to waters of the U.S. only if the discharge is determined to be the LEDPA (40 CFR §230.10 [a]). The LEDPA analysis is required for nonwater-dependent projects (essentially all surface transportation projects) that require filling of wetlands or other special aquatic sites, which are areas possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. The LEDPA generally is the practicable alternative that impacts the smallest area of waters.

Identification of the LEDPA
As described in Appendix J, shifting the footprint of either build alternative would result in a reduction of impacts to wetlands; however, the shifted footprint would require relocation of commercial properties in the study area. If only lane and shoulder widths were reduced as much as possible, mandatory design exceptions from the design standards would be required under both build alternatives, which would compromise the safety of motorists, bicyclists, and pedestrians in the study area. The No Build Alternative was also found to not be practicable because it fails to meet the proposed project’s purpose and need and would result in a continued increase in traffic congestion. Therefore, there is no practicable alternative to completely avoid impacts to wetlands.

Clean Water Act Section 404(b)(1) analysis (located in Appendix J) demonstrates compliance with the law. Because each of the build alternatives would result in impacts to more than 0.50 acre of wetlands, the practicable alternative with the least damage to wetlands must be selected as the LEDPA, unless that alternative has other significant adverse environmental consequences. The Roundabout Alternative would have the fewest impacts on resources overall, including impacts to wetlands.

2.3.2.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures
Avoidance alternatives were analyzed to determine if the impacts to wetlands could be reduced to 0.50 acre or below. If the project impacts more than 0.50 acre of wetlands, then the provisions of Section 404 (b)(1) of the Clean Water Act would be triggered, which would require the project to complete an alternatives analysis and select the LEDPA through the U.S. Army Corps of Engineers. For projects with more than 0.50 acre of impact, a Standard Individual Section 404 Permit would also be required instead of a nationwide permit. The avoidance alternatives analysis presented in the Draft IS/EA is incorporated in the LEDPA Analysis contained in Appendix J of this document.
The Project Development Team decided that the project should move forward with the original design of the build alternatives and the provisions and processes for Section 404 (b)(1) be carried out.

The following mitigation measure will be implemented to compensate for impacts to waters of the U.S. in the project limits:

- **MM WL-1:** A Section 404 Standard Individual Permit from the U.S. Army Corps of Engineers and a Section 401 Permit of the Clean Water Act and the State Porter-Cologne Water Quality Control Act from the Regional Water Quality Control Board will be obtained during final design. Compensatory mitigation at a minimum 1:1 ratio is required for all permanent wetland impacts unless the U.S. Army Corps of Engineers District Engineer determines and states in writing that other forms of mitigation are more appropriate. Final mitigation requirements will be established during the permitting phase of the project. If necessary, a Compensatory Mitigation Proposal will be submitted to the U.S. Army Corps of Engineers prior to construction.

The following project features will be implemented to protect waters of the U.S. throughout the project limits:

- **PF WL-2:** Environmentally Sensitive Area high-visibility fencing will be installed along the entire project limits to protect habitat beyond the project area.
- **PF WL-3:** A water quality inspector will inspect the site after a rain event to ensure that the stormwater best management practices are adequate.
- **PF WL-4:** The potential for adverse effects to water quality will be avoided by implementing temporary and permanent best management practices outlined in the Caltrans Stormwater Guide. Caltrans erosion-control best management practices will be used to minimize any wind- or water-related erosion. The State Water Resources Control Board has issued a National Pollutant Discharge Elimination System Stormwater Permit to Caltrans to regulate stormwater and non-stormwater discharges from Caltrans facilities. A Stormwater Pollution Prevention Plan will be developed for the project, as one is required for all projects that have at least 1 acre of soil disturbance. The Stormwater Pollution Prevention Plan complies with the Caltrans Stormwater Management Plan. The Stormwater Pollution Prevention Plan would reference the Caltrans Construction Site Best Management Practice Manual. This manual is comprehensive and includes many other protective measures that are regularly incorporated as project features and guidance to prevent and minimize pollutant discharges. It can be found at the following website: [http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm](http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm).

Project features will be included in the contract, including, but not limited to:
− No discharge of pollutants from vehicles and equipment cleaning will be allowed into the storm drain or water courses.
− Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from water courses.
− Concrete wastes will be collected in washouts and water from curing operations will be collected and disposed of and not allowed into water courses.
− Dust control will be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, rocking temporary access road entrances and exits, and covering temporary stockpiles when weather conditions require.
− Coir rolls will be installed as appropriate during construction to capture sediment, and temporary organic hydromulching will be applied to all unfinished disturbed and graded areas.
− Work areas where temporary disturbance has removed the pre-existing vegetation will be restored and re-seeded with a native seed mix.
− Graded areas will be protected from erosion using a combination of silt fences and fiber rolls along edges of designated staging areas, and with erosion-control netting such as jute or coir, as appropriate. All erosion control measures will follow Caltrans Best Management Practices Manual, Caltrans Standard Specifications, and language in the project Stormwater Pollution Prevention Plan. No erosion control materials containing monofilament mesh or netting will be used on the project site.
− A Revegetation Plan will be prepared for restoration of temporary work areas. Pavement and base placed for construction purposes will be removed to restore the area; topography blended with the surrounding area; and topsoil salvaged from the new alignment area to be placed over the restored area, which will then be revegetated with native grassland species.
− All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any aquatic habitat, culvert, or drainage feature.

### 2.3.2.5 Wetlands Only Practicable Alternative Finding

Wetlands and other waters are protected under many laws and regulations, one of which is the Executive Order for the Protection of Wetlands (Executive Order 11990). Executive Order 11990 regulates the activities of federal agencies with regards to wetlands. It essentially provides that a federal agency cannot undertake or provide assistance for new construction located in wetlands unless it finds: (1) that there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm to wetlands.

Two build alternatives were evaluated in the Draft Environmental Document. Other alternatives were considered and eliminated prior to the Draft Environmental Document due
to a variety of factors discussed in Section 1.6 and in Appendix J under the Avoidance Alternatives Analysis. Given the presence of wetlands in the southwest quadrant and the northeast quadrant, there is no alternate alignment alternative that would completely avoid wetlands. The No Build Alternative was also found to not be practicable because it would not meet the proposed project’s purpose and need and would result in greater traffic congestion. Therefore, there is no practicable alternative to avoid impacts to wetlands.

The Roundabout Alternative would include all practicable measures to minimize harm to wetlands based on laws and regulations previously discussed in this chapter. Mitigation would be required to compensate for the loss of wetland habitat as a result of the proposed project. Based on the above considerations, it is determined that there is no practicable alternative that does not include impacts to wetlands and that the preferred alternative includes all practicable measures to minimize harm to wetlands that may result from such use.

2.3.3 Plant Species

2.3.3.1 Regulatory Setting

The U.S. Fish and Wildlife Service and California Department of Fish and Wildlife have 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 provided 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 Federal Endangered Species Act and/or the California Endangered Species Act. Please see Section 2.3.5, Threatened and Endangered Species, in this document for detailed information about these species.

This section of the document discusses all of the other special-status plant species, including California Department of Fish and Wildlife species of special concern, U.S. Fish and Wildlife Service candidate species, and California Native Plant Society rare and endangered plants.

The regulatory requirements for the Federal Endangered Species Act can be found at 16 U.S.C., Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for the California Endangered Species Act 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 California Fish and Game Code, Section 1900-1913, and CEQA, CA PRC, Sections 2100-21177.
2.3.3.2 Affected Environment

The following is summarized from the *Natural Environment Study* (October 2017). Project biologists conducted surveys for listed plant species during the blooming period in all accessible portions of the study area in February and May 2015. Based on literature review and database searches, 46 plant species were found to possibly occur in the study area. Field botanical surveys, and review of habitat requirements indicated that 7 special-status plant species have the potential to occur within the study area. Listed plant species that have suitable habitat within the study area, as well as California Natural Diversity Database occurrences within a 5-mile radius of the study area, are shown in Table 2.3-7.

### Table 2.3-7: Special-Status Plant Species Potentially Occurring or Known to Occur in the Study Area

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
<th>Potential to Occur in the Study Area</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Franciscan onion</td>
<td>CNPS 1B.2</td>
<td>Cismontane woodland, valley and foothill grassland.</td>
<td><strong>Low</strong>. The nearest California Natural Diversity Database record is for plants observed in 2006 in a mixed hardwood forest approximately 4 miles north of the project area.</td>
<td></td>
</tr>
<tr>
<td><em>Allium peninsulare</em> var. <em>franciscanum</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrow-anthered California brodiaea <em>Broadiaea leptandra</em></td>
<td>CNPS 1B.2</td>
<td>Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland.</td>
<td><strong>Low</strong>. The California Natural Diversity Database provides a vague record for this species that provides no date or site location other than an area that is approximately 4 miles northeast of the project area.</td>
<td></td>
</tr>
<tr>
<td>Pappose tarplant <em>Centromadia parryi</em> ssp. <em>parryi</em></td>
<td>CNPS 1B.2</td>
<td>Chaparral, coastal prairie, meadows and seeps, coastal salt marshes and swamps, vernally mesic valley and foothill grassland.</td>
<td><strong>Low</strong>. The only California Natural Diversity Database record is for plants observed in 1933 in a field that is approximately 1 mile south of the project area.</td>
<td></td>
</tr>
<tr>
<td>Dwarf downingia <em>Downingia pusilla</em></td>
<td>CNPS 2</td>
<td>Mesic valley and foothill grassland, vernal pools.</td>
<td><strong>Low</strong>. The nearest California Natural Diversity Database record is for plants observed in 1961 in a roadside ditch along SR 121 approximately 2 miles south of the project area. Suitable habitat may be present in the study area in inaccessible areas where impacts would not occur.</td>
<td></td>
</tr>
<tr>
<td>Fragrant fritillary <em>Fritillaria liliacea</em></td>
<td>CNPS 1B.2</td>
<td>Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland often.</td>
<td><strong>Not likely</strong>. The only recent California Natural Diversity Database record is for a 2003 observation of this species somewhere in Sonoma County Open Space land approximately 4.5 miles northwest of the project area.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2.3-7: Special-Status Plant Species
Potentially Occurring or Known to Occur in the Study Area

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
<th>Potential to Occur in the Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mt. Diablo cottonweed</td>
<td>CNPS 3.2</td>
<td>Broadleafed upland forest, chaparral, cismontane woodland, valley and foothill grassland.</td>
<td>Not likely. No California Natural Diversity Database records for this species; however, there are a few records listed on the Calflora Website approximately 3 miles northeast of the project site.</td>
</tr>
<tr>
<td><em>Micropus amphibolus</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saline clover</td>
<td>CNPS 1B</td>
<td>Marshes and swamps, valley and foothill grasslands, vernal pools.</td>
<td>Low. The nearest California Natural Diversity Database record from 1996 is for a large population of plants in the Viansa wetlands approximately 1.6 miles south of the project area.</td>
</tr>
<tr>
<td><em>Trifolium hydrophilum</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Status Codes:
California Native Plant Society (CNPS) Rare Plant Rank
1B = rare, threatened, or endangered in California and elsewhere
2 = rare, threatened, or endangered in California, but more common elsewhere
3 = Plants about Which More Information is Needed – A Review List

Threat Rank:
0.1 – Seriously threatened in California
0.2 – Moderately threatened in California


None of the special-status plant species identified above was observed within the surveyed portions of the study area during February and May 2015 surveys. It should be noted that wetland and vernal pool plant surveys were conducted during drought years; during years of normal rainfall, these plant species could be present. When the inaccessible parcel northeast of the intersection becomes accessible to biologists, seasonally timed special-status plant surveys will occur prior to project construction. If protected species are discovered, appropriate agency coordination with the California Department of Fish and Wildlife and additional protection measures would be established.

### 2.3.3.3 Environmental Consequences

As a result of refined analysis and ongoing expert consultations made between circulation of the Draft Environmental Document and preparation of the Final Environmental Document, impacts to plant species have changed, as discussed in the analysis below.
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Project-Level Impacts

Build Alternatives
Because the special-status plant species identified in Table 2.3-7 were not observed in the accessible portions of the study area during field surveys, impacts during normal use of the intersection are not anticipated under either build alternative. When the inaccessible parcel northeast of the intersection becomes accessible, seasonally timed special-status plant surveys will occur prior to project construction. It is possible, although unlikely, that special-status plant species may be found in the northeast parcel once surveys are completed.

No Build Alternative
The No Build Alternative would not impact special-status plant species.

Construction Impacts

Build Alternatives
The impacts of both build alternatives would be the same as one another. Because the special-status plant species identified in Table 2.3-7 were not observed in the surveyed portion of the study area during surveys, impacts are not anticipated. When the inaccessible parcel northeast of the intersection becomes accessible to biologists, seasonally timed special-status plant surveys would occur prior to project construction. If special-status plant species are observed during these surveys, potential direct impacts could occur during construction due to ground-disturbing activities and installation of impervious surfaces, primarily associated with work in the northeast quadrant. Because access is not available in the northeast parcel, potential impacts to special-status plant species cannot be quantified.

No Build Alternative
The No Build Alternative would not impact special-status plant species.

2.3.3.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures
The general project features identified in Section 2.3.1.3 will also avoid impacts to special-status plant species. In addition, the following avoidance and minimization measure and project features will be implemented for both build alternatives:

- **AMM PS-1:** Following access permission and prior to the onset of construction, a qualified biologist will conduct botanical surveys throughout the northeast quadrant of the project footprint during the blooming season for the plant species described in this section, in addition to Sonoma sunshine (March through May) and Contra Costa goldfields (March through June).
- **PF PS-2:** Information regarding construction, access, and staging boundaries, along with measures to contain erosion, dust, and discharges, will be presented by the U.S. Fish and Wildlife Service-approved biologist during the worker environmental awareness training.
PF PS-3: If the preconstruction botanical survey identifies special-status plant species within the project footprint, California Department of Fish and Wildlife or U.S. Fish and Wildlife Service will be contacted.

2.3.4 Animal Species

2.3.4.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration’s National Marine Fisheries Service, and the California Department of Fish and Wildlife are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.5. All other special-status animal species are discussed here, including California Department of Fish and Wildlife fully protected species and species of special concern, and U.S. Fish and Wildlife Service or National Oceanic and Atmospheric Administration’s National Marine Fisheries Service candidate species.

Federal laws and regulations relevant to wildlife include the following:

- NEPA
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act
- Federal Endangered Species Act

State laws and regulations relevant to wildlife include the following:

- CEQA
- Sections 1600 – 1603 of the California Fish and Game Code
- Sections 4150 and 4152 of the California Fish and Game Code
- California Endangered Species Act

2.3.4.2 Affected Environment

The following is summarized from the Natural Environment Study (October 2017). The habitats within the study area and vicinity support a variety of wildlife species typical of the region. Wildlife, especially urban-adapted species such as squirrel and Virginia opossum, could use the paved areas and the highways to travel between habitats.

Special-status or protected wildlife species that could be present within the landscaped portion of the study area would include nesting birds and bats. A variety of bird species was observed within the study area, including acorn woodpecker, western bluebirds (Sialia mexicana), red-tailed hawk (Buteo jamaicensis), and turkey vulture (Cathartes aura).
Wildlife habitat assessments were conducted within the study area during various site visits in 2014 and 2015. Of the 27 wildlife species initially considered, the following species have the potential to occur within the study area: western pond turtle; bats, including the pallid bat (*Antrozous pallidus*); and migratory birds.

**Western Pond Turtle**

The western pond turtle is a California species of special concern, and the U.S. Fish and Wildlife Service is in the candidate assessment process for protection of this species under the Federal Endangered Species Act. The western pond turtle occurs in a variety of permanent and intermittent aquatic habitats, such as ponds, marshes, rivers, streams, irrigation ditches, and ephemeral pools. They dig their nests in dry soils upland of streams in areas with sparse vegetation and southern exposure.

An adult western pond turtle was observed during the February 2015 survey in a pond 670 feet south, outside of the study area. It is possible that the pond provides suitable breeding habitat; however, there is no breeding habitat within the study area or adjacent to, within the known distance a turtle would go to build a nest, due to the high degree of disturbance of the upland areas associated with vineyard management practices and the highly traveled highways. Suitable nesting habitat may be nearby in Yellow Creek downstream of the study area. There are also three California Natural Diversity Database records for western pond turtle in reservoirs and irrigation ponds outside the study area. The nearest record is for turtles found in a pond near Schell Creek at a location approximately 1.7 miles northeast of the study area. There is a high potential for this species to disperse through or forage in creeks, ditches, and drainages in the study area.

**Bats**

Bats have the potential to occur within the study area. They are typically found near aquatic features that provide foraging opportunities. They prefer open water, such as lakes and marshes where flying insects are abundant. Specifically, the pallid bat has been identified as having a moderate potential to occur within the study area. It is a California species of special concern and is most common in open, dry habitats with rocky areas for roosting. There is one California Natural Diversity Database record for a colony of pallid bats roosting beneath the Sonoma Creek Bridge on Watmaugh Road, which is approximately 2 miles north of the study area. Buildings and tall trees within the study area provide suitable day and night roosting habitat for special-status and nonlisted bats. No bats were observed during field visits.

**Migratory Birds**

The federal Migratory Bird Treaty Act and California Fish and Game Code protect the occupied nests and eggs of migratory birds. Birds can nest in a variety of places, including
trees, shrubs, man-made structures, and the ground. Any proposed project must take measures to avoid the take of any migratory birds, nests, or eggs.

There is an abundance of potential nesting habitat within the study area. Great horned owl (*Bubo virginianus*), red-shouldered hawk (*Buteo lineatus*), and numerous other raptors were observed exhibiting breeding behavior during spring 2015 surveys; however, no active or inactive raptor nests were found within the study area. Birds observed nesting in the study area during the site surveys include killdeer (*Charadrius vociferus*), Brewer’s blackbird, and acorn woodpecker.

### 2.3.4.3 Environmental Consequences

#### Project-Level Impacts

**Build Alternatives**

The impacts of both build alternatives would be very similar to another. The build alternatives have the potential to permanently affect western pond turtle through removal of wetlands habitat. The Roundabout Alternative would permanently impact 1.50 acres of wetland habitat, while the Signalized Intersection would permanently impact 1.53 acres of wetland habitat. This habitat removal could make it more difficult for western pond turtle to survive in and around the project area. There would be no effects to suitable breeding habitat because it is absent from the study area.

The removal of large trees within the project area that may provide suitable roosting habitat would impact bats. As described in Section 2.3.1, Natural Communities, 36 native trees and 74 non-native trees would be removed under the Roundabout Alternative, while 49 native and 89 non-native trees would be removed under the Signalized Intersection Alternative. The onsite replacement of trees would restore roosting habitat over time.

The removal of trees and vegetation could also result in the loss of suitable nesting habitat for migratory birds and raptors. Replacement planting of trees onsite would re-establish nesting habitat over time.

**No Build Alternative**

The No Build Alternative would have no effect on animal species because habitat removal would not occur.

#### Construction Impacts

**Build Alternatives**

The impacts of both build alternatives would be the same as one another. Direct impacts to individual western pond turtles may result from relocation efforts and earth-moving activities in potential habitat during construction of the build alternatives. Indirect impacts may result
from water quality degradation from erosion or sediment loading due to construction activities. These direct and indirect impacts could cause mortality of individual western pond turtle and habitat degradation, which could make it more difficult for them to survive in and around the project area.

The proposed project activities under both build alternatives would have the potential to result in the removal of nests, young, or individuals of protected species of migratory birds and bats. Construction-related disturbance during the nesting season could result in the loss of fertile eggs or nestlings or otherwise lead to the abandonment of nests. During project-related construction activities, common migratory birds and bats may be temporarily displaced by habitat alteration or noise from construction equipment. Avoidance and minimization measures would be implemented to avoid these impacts.

**No Build Alternative**
The No Build Alternative would have no effect on animal species because construction activities would not occur.

### 2.3.4.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures

#### Western Pond Turtle

The following project feature and avoidance and minimization measures will be implemented to avoid impacts to western pond turtle:

- **AMM AS-1: Western Pond Turtle Monitoring.** An agency-approved biologist will be onsite during initial ground-disturbing activities, and thereafter as needed to fulfill the role of the agency-approved biologist as specified in project permits. Through the Resident Engineer or designee, the agency-approved biologist will be given the authority to communicate verbally, by telephone, by e-mail, or by hard copy, with all project personnel to ensure that take of western pond turtle is minimized and permit requirements are fully implemented. Through the Resident Engineer or designee, the agency-approved biologist will have the authority to stop project activities to minimize take of western pond turtle or if he or she determines that any requirements are not fully implemented. If the agency-approved biologist exercises this authority, the agencies shall be notified by telephone and e-mail within 48 hours.

- **AMM AS-2: Wildlife Exclusion Fencing.** A qualified biologist will delineate on the project plans where the wildlife exclusion fencing should be erected to protect against western pond turtle entering the work site. Prior to the commencement of construction, under the advice of a biological monitor, wildlife exclusion fencing will be installed.
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- **PF AS-3: Worker Environmental Awareness Training.** All construction-related personnel will attend a mandatory environmental education program delivered by the agency-approved biologist prior to working on the project.

- **AMM AS-4: Preconstruction Surveys.** The biologist will be notified 5 days prior to ground disturbance, and preconstruction surveys for western pond turtle will be conducted by an agency-approved biologist. These surveys will consist of walking surveys of the project limits and, if possible, accessible adjacent areas within at least 50 feet of the project limits. The biologist will investigate all potential cover sites. Western pond turtles found within the project limits will be documented and relocated to a predetermined suitable habitat at a safe distance from the project limits.

- **AMM AS-5: Western Pond Turtle Onsite.** The Resident Engineer or designee will immediately contact the agency-approved biologist if a western pond turtle is observed within a construction zone. Construction activities will be suspended within a 50-foot radius of the animal until the animal leaves the site voluntarily or as coordinated with the appropriate agency.

**Pallid Bat and Other Roosting Bats**

The following avoidance and minimization measure will be implemented to avoid impacts on roosting bats:

- **AMM AS-6:** To avoid impacts to roosting bats, a Caltrans-approved qualified biologist will conduct visual and acoustic surveys during the maternity season prior to construction. The surveys will be conducted to determine if bats are utilizing the trees or other roost sites within the study area. If active roosting habitat is identified, minimization measures will be identified through consultation with California Department of Fish and Wildlife and bat specialists. If bats are found during the survey, a plan will be developed for passive relocation.

**Migratory Birds**

The following project features will be implemented to minimize impacts to migratory and nongame bird species:

- **PF AS-7:** During nesting season, unoccupied or incomplete nests will be excluded or removed within the project footprint as coordinated by the Caltrans project biologist.

- **PF AS-8:** Preconstruction surveys for nesting birds will be conducted by a qualified biologist no more than 72 hours prior to the start of construction for activities occurring during the nesting season (February 1 to September 30).

- **PF AS-9:** If an active nest of a raptor, non-game, or migratory bird species is found, a no work zone buffer will be established to minimize disturbance. A 300-foot buffer will be
erected around active raptor nests, and a 50-foot buffer will be erected around active game and non-game bird (non-raptor) nests. The Caltrans biologist will coordinate with California Department of Fish and Wildlife and U.S. Fish and Wildlife Service for appropriate biological monitoring and the establishment of an adequate buffer. If active nests are present, biological monitoring will be required.

2.3.5 Threatened and Endangered Species

2.3.5.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act: 16 U.S.C. Section 1531, et seq. See also 50 CFR Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration, are required to consult with the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration’s National Marine Fisheries Service 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 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence, and/or documentation of a No Effect finding. Section 3 of the Federal Endangered Species Act 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 California Endangered Species Act, California Fish and Game Code Section 2050, et seq. The California Endangered Species Act 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 California Department of Fish and Wildlife is the agency responsible for implementing the California Endangered Species Act. Section 2081 of the 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 Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California Endangered Species Act allows for take incidental to otherwise lawful development projects; for these actions, an incidental take permit is issued by the California Department of Fish and Wildlife. For species listed under both the Federal Endangered Species Act and California Endangered Species Act requiring a Biological Opinion under Section 7 of the Federal Endangered Species Act, the California Department of Fish and Wildlife may also authorize impacts to California Endangered Species Act species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.
Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the U.S., by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

2.3.5.2 Affected Environment

The following is summarized from the Natural Environment Study (October 2017), the Biological Assessment (September 2016), and the Biological Opinion (April 2017). The U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife are the primary agencies responsible for coordination and review involving special-status species.

The findings summarized in this section were based on extensive research and botanical and wildlife field surveys conducted by project biologists in February and May 2015 for special-status species in the study area and its vicinity, including a California red-legged frog (*Rana draytonii*) habitat assessment and nighttime study conducted in February 2015. Prior to the surveys, record searches of the U.S. Fish and Wildlife Service species lists and the California Natural Diversity Database were conducted. It should be noted that the northeast parcel of the study area was inaccessible during surveys.

U.S. Fish and Wildlife Service species records were reviewed at the outset of the biological studies for the project. A copy of the records list is included in Appendix F. On March 4, 2015, Caltrans met with the U.S. Fish and Wildlife Service at the project site to discuss the project and special-status species that could occur in the area. Based on this site visit, Caltrans initiated consultation with the U.S. Fish and Wildlife Service for California red-legged frog, vernal pool fairy shrimp, Sonoma sunshine, and Contra Costa goldfields under Section 7 of the Federal Endangered Species Act. After the Preferred Alternative was selected, Caltrans submitted a Biological Assessment to the U.S. Fish and Wildlife Service discussing the studies performed to date and potential impacts to listed species.

The following sections describe the listed species that were included in the United States Fish and Wildlife Service consultation.

**Sonoma Sunshine**

Sonoma sunshine is a federally endangered species and a state endangered species. Habitat for this species is in valley and foothill grasslands and in vernal pools. There are California Natural Diversity Database records for this species on the north side of Bonneau Road 700 feet west
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of the western study area boundary. It was also observed 0.5 mile north of the northern boundary of the study area. It was not observed during May 2015 botanical surveys, although surveys were conducted at the end of the blooming season for this species and during a prolonged drought. It is not likely for this species to occur within the study area; however, due to access restrictions of the northeast parcel, surveys were not completed, and the potential for presence cannot be entirely ruled out.

**Contra Costa Goldfields**

Contra Costa goldfields is a federally endangered species. Its habitat preferences include woodland, playas in alkaline soils, valley and foothill grassland, and vernal pools. The nearest record for this species is for a small population of plants observed in 2003 in vernal pool grasslands approximately 3 miles west of the study area. This species was not observed during the May 2015 botanical surveys; therefore, it is not likely for this species to occur within the study area. However, due to access restrictions of the northeast parcel, surveys were not completed, and the potential for presence cannot be entirely ruled out.

**Vernal Pool Fairy Shrimp**

Vernal pool fairy shrimp are a federally threatened species. They inhabit vernal pools, specifically, small, clear-water sandstone-depression pools, and grassed depression pools. Visual observations from the roadside and historical aerial imagery dating back to 1993 demonstrate that several locations within the inaccessible field in the northeast quadrant appear to be inundated at various times throughout the year. Based on offsite visual evaluations conducted for the inaccessible field over the course of the 2014-2015 surveys, biologists assumed that there are no vernal pools within the project footprint based on their professional judgment; however, because California has been experiencing a severe drought, wetlands and vernal pools may be more difficult to assess given abnormal conditions. When access becomes available, wetland delineations and rare plant surveys will be conducted to confirm presence or absence of the vernal pools. If vernal pools are present, there is a low potential for vernal pool fairy shrimp to be present. The single California Natural Diversity Database record for this species is within Napa County in 2007 in one vernal pool at the Napa Airport. This location is approximately 10 miles east of the study area. Due to the distance of this occurrence to the study area and the observed lack of habitat indicators, it is not likely that vernal pool fairy shrimp occur within the study area.

**California Red Legged Frog**

California red-legged frog is a federally threatened species and a California species of special concern. They occur in a variety of ponds, sloughs, low-gradient streams, and low-salinity lagoons. Adults may forage in, and migrate through, terrestrial grasslands, riparian woodlands, and forests, but they require weedy, slow-moving or standing water that persists through most
of the dry season for successful reproduction. There are two California Natural Diversity Database records approximately 2.4 miles west of the project area. One is for a frog observed in 2004 in a ponded area of Champlin Creek. The second is for frogs observed in 2002 in an abandoned leachate pond at the Sonoma Transfer Station. The study area is outside the U.S. Fish and Wildlife Service-designated critical habitat for this species. Suitable upland dispersal habitat exists within the study area, but no suitable breeding habitat is present in any of the water features within the study area; therefore, there is a moderate potential for California red-legged frog to occur within the study area.

### 2.3.5.3 Environmental Consequences

As a result of refined analysis and ongoing expert consultations conducted as part of the *Biological Assessment* and *Biological Opinion* (dated April 12, 2017, and included in Appendix G), which occurred between circulation of the Draft Environmental Document and preparation of the Final Environmental Document, impacts to threatened and endangered species have changed or have been updated, as discussed in the analysis below.

#### Project-Level Impacts

**Build Alternatives**

The following sections discuss the potential project-level impacts of the build alternatives on listed species.

**Sonoma Sunshine and Contra Costa Goldfields**

Sonoma sunshine and Contra Costa goldfields were not observed within the surveyed portions of the study area. Due to the inaccessible parcel in the northeast quadrant of the intersection, the potential presence/absence of these species within the study area would be fully determined when access to the property is granted and field surveys can be conducted. However, because it is not likely for these species to occur within the study area, impacts would be minimal.

Caltrans received concurrence from the U.S. Fish and Wildlife Service that the project is not likely to adversely affect Sonoma sunshine and is not likely to adversely affect Contra Costa goldfields. This determination is based on the lack of observation of these species during surveys and the distance between the study area and the closest known occurrences.

**Vernal Pool Fairy Shrimp**

If vernal pool fairy shrimp are found in future surveys (i.e., in the potential wetlands in the northeast quadrant), both alternatives would have temporary and permanent impacts to vernal pool fairy shrimp habitat. Impacts would be associated with ground-disturbing activities, installation of biotreatment areas, placement of fill, pavement, and reduction to potential vernal pool fairy shrimp habitat. Caltrans received concurrence from the U.S. Fish and Wildlife Service.
Service that the project is not likely to adversely affect vernal pool fairy shrimp. This determination is based on the lack of observation of this species during surveys and the distance between the study area and the closest known occurrences.

**California Red-Legged Frog**

California red-legged frog could disperse through the drainages and terrestrial areas of the study area. The Roundabout Alternative would impact a total of 4.43 acres of California red-legged frog upland dispersal habitat (grassland and wetland) including 3.27 acres of permanent impacts and 1.16 acres of temporary impacts. Permanent impacts under the Roundabout Alternative include the addition of new pavement, filling of wetlands, and construction of biotreatment areas in areas that are currently identified as California red-legged frog upland dispersal habitat. The temporary impacts for the Roundabout Alternative include areas where clearing and grubbing and staging of construction materials will occur. All temporary impact areas will be hydroseeded with native grasses at the completion of the project. The Signalized Intersection Alternative would permanently impact 1.55 acres of California red-legged frog upland dispersal habitat and temporarily impact 2.01 acres of habitat through the addition of new pavement and filling of wetlands. There is no breeding habitat present within the study area; therefore, no permanent impacts could occur. In addition, direct impacts to individual California red-legged frogs are not anticipated during project operation. Caltrans received concurrence from the U.S. Fish and Wildlife Service that the project may affect, and is likely to adversely affect, California red-legged frog.

Implementing the project features and avoidance and minimization measures described below would minimize potential impacts to the California red-legged frog in the study area.

Table 2.3-8 summarizes the federal Endangered Species Act effect findings.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Status</th>
<th>Effect Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sonoma sunshine</td>
<td><em>Blennosperma bakeri</em></td>
<td>FE</td>
<td>Not likely to adversely affect</td>
</tr>
<tr>
<td>Contra Costa goldfields</td>
<td><em>Lasthenia conjugens</em></td>
<td>FE</td>
<td>Not likely to adversely affect</td>
</tr>
<tr>
<td>Vernal pool fairy shrimp</td>
<td><em>Branchinecta lynchi</em></td>
<td>FT</td>
<td>Not likely to adversely affect</td>
</tr>
<tr>
<td>California red-legged frog</td>
<td><em>Rana draytonii</em></td>
<td>FT</td>
<td>May affect, likely to adversely affect</td>
</tr>
</tbody>
</table>

Table 2.3-8: Federal Endangered Species Act Effect Findings
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No Build Alternative
The No Build Alternative would not affect listed species because project implementation and habitat removal would not occur.

Construction Impacts

Build Alternatives
The construction impacts are the same under both build alternatives. Sonoma sunshine and Contra Costa goldfields could be eradicated during grading of the project area. Potential direct impacts are associated with ground-disturbing activities during general project construction and installation of impervious surfaces, primarily associated with work in the northeast quadrant.

Vernal pool fairy shrimp and California red-legged frog could be captured, injured, or killed by construction-related personnel or equipment during project construction if they enter or are found in the work area. Project features and avoidance and minimization measures will be implemented to minimize the chance of this.

No Build Alternative
The No Build Alternative would not affect listed species because construction activities would not occur.

2.3.5.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures
When the undeveloped field northeast of the intersection becomes accessible to biologists, seasonally timed special-status plant surveys and surveys for vernal pool fairy shrimp will be completed prior to project construction. If protected species are discovered, the U.S. Fish and Wildlife Service will be contacted, and protective measures will be established. In addition, the project features and avoidance and minimization measures identified in Section 2.3.1.3 will also avoid and minimize impacts to threatened and endangered species.

Sonoma Sunshine and Contra Costa Goldfields
When access becomes available, surveys will be conducted, and the presence of these species will be evaluated. If Sonoma sunshine and/or Contra Costa goldfields are discovered, appropriate agency coordination and protective measures will be established.

Project features that will be implemented during construction include:

- **PF TE-1**: Dust control will include use of water trucks and dust palliatives to control dust in excavation and fill areas and covering temporary stockpiles when weather conditions require.
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The project features and avoidance and minimization measures described in Section 2.3.3.4 (AMM PS-1 and PF PS-2 and -3) also apply to these listed plant species.

**Vernal Pool Fairy Shrimp**

When access becomes available, surveys will be conducted, and the presence of this species will be evaluated. If vernal pool fairy shrimp are discovered, appropriate agency coordination and protective measures will be established. Minimization measures and project features to avoid and minimize potential impacts to vernal pool fairy shrimp include:

- **AMM TE-2:** Conduct preconstruction surveys, during the appropriate time of year, to determine the presence or absence of vernal pool fairy shrimp.
- **AMM TE-3:** If vernal pool fairy shrimp are observed, the U.S. Fish and Wildlife Service will be contacted to determine appropriate measures.
- **PF TE-4:** Caltrans will avoid effects to vernal pools beyond the project footprint by employing permanent and temporary best management practices, including a Stormwater Pollution Prevention Plan, and erosion control best management practices. In areas that flow hydrologically from the project footprint to vernal pool crustaceans habitat, Caltrans will erect linear sediment barriers (e.g., silt fences or coir rolls) to avoid discharge of sediment or other materials that may adversely affect vernal pool ecosystems.

If vernal pool fairy shrimp are observed, and it is determined the project may adversely affect this species or its habitat, consultation with the U.S. Fish and Wildlife Service will be re-initiated. Compensatory mitigation, if required, would be determined through consultation with the U.S. Fish and Wildlife Service. If needed, compensatory mitigation would be similar to wetland mitigation. Mitigation bank vernal pool credits could be used to fully mitigate vernal pool impacts. If necessary, a Compensatory Mitigation Proposal would be submitted to the U.S. Fish and Wildlife Service prior to construction.

**California Red-Legged Frog**

The following project features, avoidance, minimization, and mitigation measures will be implemented to minimize impacts on California red-legged frogs:

- **MM TE-5:** Caltrans will compensate to offset the estimated loss of 4.43 acres of California red-legged frog habitat (3.27 acres permanent + 1.16 acres temporary) by one or a combination of beneficial actions for the species. These actions may include the purchase of California red-legged frog credits at a U.S. Fish and Wildlife Service-approved conservation bank, habitat restoration in Sonoma County; contribution to a larger advanced mitigation property acquisition in Sonoma County; habitat management; or other beneficial measure that will aid local recovery of the species. Caltrans will provide options for the
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U.S. Fish and Wildlife Service to review prior to the onset of project construction, and an acceptable option will be selected and initiated prior to the completion of construction.

- **PF TE-6**: Before the onset of construction activities, a U.S. Fish and Wildlife Service-approved biologist will conduct an environmental education program for construction personnel in accordance with the Biological Opinion.

- **AMM TE-7**: No less than 3 days prior to initial ground disturbance in any given area, preconstruction surveys for the California red-legged frog will be conducted by a U.S. Fish and Wildlife Service-approved biologist. These surveys will consist of walking surveys of the project footprint and, if possible, accessible adjacent areas within at least 50 feet of the project footprint. The biologist will investigate all potential cover sites. This includes thorough investigation of mammal burrows, appropriately sized soil cracks, and debris. California red-legged frog found within the project limits will be documented and relocated to a predetermined suitable habitat at a safe distance from the project limits.

- **AMM TE-8**: The U.S. Fish and Wildlife Service-approved biologist(s) will perform a California red-legged frog clearance survey immediately prior to the initial ground disturbance within areas identified as California red-legged frog habitat. Safety permitting, the U.S. Fish and Wildlife Service-approved biologist(s) will investigate areas of disturbed soil for signs of the listed species within 30 minutes following the initial disturbance of that given area.

- **PF TE-9**: The U.S. Fish and Wildlife Service-approved biological monitor(s) will be onsite during initial ground-disturbing activities and thereafter as specified in project permits. Through the Resident Engineer or their designee, the U.S. Fish and Wildlife Service-approved biologist will have the authority to stop project activities to minimize take of the California red-legged frog or if they determine that any permit requirements are not being fully implemented. If the U.S. Fish and Wildlife Service-approved biologist exercises this authority, the U.S. Fish and Wildlife Service will be notified by telephone and e-mail within 24 hours.

- **AMM TE-10**: High visibility fencing, staking, or other obvious markers will be installed around project limits and inspected by a U.S. Fish and Wildlife Service-approved biologist before construction and monitored regularly to ensure its integrity. The boundaries of the construction area will be fenced/identified, and all actions will be confined within the area. Access to and from the project area will be clearly marked with signs. Clearly identifying the work boundary will prevent the encroachment of construction equipment and personnel into adjacent California red-legged frog habitat not identified for ground disturbance. The final project plans will depict all locations where boundary fencing/or other identifiers will be installed and how they will be installed. The special provisions in the bid solicitation package will describe acceptable material and prohibited construction activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within California red-legged frog habitat.
- **PF TE-11:** Vegetation will be cleared only where necessary and will be cut above soil level in areas of temporary disturbance that will be subject to postconstruction revegetation. Vegetation clearing will be in accordance with Migratory Bird Treaty Act Guidelines contained herein.

- **AMM TE-12:** To prevent inadvertent entrapment of the California red-legged frog during construction, excavated holes or trenches more than 1 foot deep with walls steeper than 30 degrees will have escape ramps installed and will be covered at the close of each working day by plywood or similar materials. Before holes or trenches are filled, U.S. Fish and Wildlife Service-approved biological monitor(s) will thoroughly inspect them for California red-legged frog. If, at any time, a trapped California red-legged frog is discovered, the U.S. Fish and Wildlife Service-approved biologist will remove and relocate the frog. The U.S. Fish and Wildlife Service will be notified of the incident by telephone and e-mail within 24 hours.

- **PF TE-13:** The U.S. Fish and Wildlife Service-approved biologist(s) will have oversight over implementation of the Terms and Conditions of the Biological Opinion and the measures including, but not limited to, PF TE-6, PF TE-8, AMM-10, AMM TE-12, and will have the direct authority to stop project activities that may result in the take of a listed species or if the requirements associated with the Terms and Conditions of the Biological Opinion are not being fulfilled. The U.S. Fish and Wildlife Service-approved biologist(s) will coordinate with the Resident Engineer to stop work if necessary.

- **AMM TE-14:** The U.S. Fish and Wildlife Service-approved biological monitor, Resident Engineer, or their designee will halt work immediately and contact the U.S. Fish and Wildlife Service if a California red-legged frog is found within the construction zone. The biological monitor will suspend all construction activities within 50 feet of active construction until the California red-legged frog leaves the site voluntarily or is removed by the biologist to a release site using U.S. Fish and Wildlife Service-approved translocation/relocation techniques.

- **PF TE-15:** If work is stopped, the biologist(s) will notify the U.S. Fish and Wildlife Service by telephone and e-mail within 24 hours.

- **PF TE-16:** Caltrans Construction Site Best Management Practices will be implemented.

- **PF TE-17:** Plastic monofilament netting (erosion-control matting) or similar material will not be used for the project because California red-legged frog may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

- **PF TE-18:** Caltrans will develop the plan to restore temporarily disturbed areas to baseline ecological function and values to the maximum extent practicable. The contractor will remove construction materials, including fencing, after construction activities are complete. The contractor will clean up, recontour to the original grade where feasible, and
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protect by implementation of erosion control measures any temporarily disturbed areas. Caltrans will provide a restoration and revegetation plan for the project to be reviewed and approved by the U.S. Fish and Wildlife Service no later than 60 calendar days prior to the initial groundbreaking at the project site. The plan will include, but will not be limited to, schedule, methodology, a list of the seed mixes and container plants, plant material source, irrigation maintenance schedule, monitoring program, success criteria, control of invasive, noxious weeds, and remediation and adaptive management. A revegetation status and success report will be submitted on or before December 31 of each year monitoring is conducted.

- **PF TE-19**: All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any aquatic habitat, culvert, or drainage features, etc.

- **PF TE-20**: If requested, before, during, or upon completion of ground-breaking and construction activities, Caltrans will allow access by the U.S. Fish and Wildlife Service personnel into the project footprint to inspect the project and its activities.

2.3.6 Invasive Species

2.3.6.1 Regulatory Setting

On February 3, 1999, President William J. 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.” Federal Highway Administration guidance issued August 10, 1999, directs the use of the State’s invasive species list maintained by the California Invasive Species Council to define the invasive species that must be considered as part of NEPA analysis for a proposed project.

2.3.6.2 Affected Environment

This section summarizes the findings of the *Natural Environment Study* (October 2017). Surveys of the study area were conducted by project biologists in February and May 2015. The study area contains non-native, invasive species typical of disturbed areas along highways. These include pampas grass (*Cortaderia* spp.), Himalayan blackberry (*Rubus armeniacus*), sweet fennel (*Foeniculum vulgare*), and iceplant (*Carpobrotus edulis*).
2.3.6.3 Environmental Consequences

Project-Level Impacts

Build Alternatives
The impacts of both build alternatives would be the same as one another. None of the identified species on the California list of invasive species is currently used by Caltrans for erosion control or landscaping to stop the spread of invasive species. Avoidance and minimization measures would be implemented to prevent the introduction or spread of invasive species.

No Build Alternative
The No Build Alternative would not have the potential to affect or spread invasive species because the project would not be implemented.

Construction Impacts

Build Alternatives
The impacts of both build alternatives would be the same as one another. Project construction activities could have the potential to inadvertently spread invasive species because they are present in the study area. Construction equipment could pick up an invasive species in one location and move it to another location. Avoidance and minimization measures would be implemented to reduce the potential for the spread of invasive species within the study area.

No Build Alternative
The No Build Alternative would not have the potential to affect or spread invasive species because the project would not be implemented.

2.3.6.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures

The following project features will be implemented for both build alternatives:

- **PF IS-1**: Areas subject to noxious weed removal or disturbance will be replanted with fast-growing native grasses or a native erosion-control seed mix. Invasive, exotic plants will be controlled within the areas disturbed by the project to the maximum extent practicable, pursuant to Executive Order 13112.

- **PF IS-2**: A heavy equipment wash station will be established or designated on site. All heavy equipment entering the site will be washed cleaned of debris prior to entering the site to minimize the spread of invasive weeds.
2.4 Cumulative Impacts

2.4.1 Regulatory Setting

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

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive 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.

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

2.4.2 Projects Considered for Cumulative Analysis

To evaluate the potential for cumulative impacts, a list of projects was defined through review of private development applications at the Sonoma County Permit and Resource Management Department and public works projects at the Department of Transportation and Public Works. The Governor’s Office of Planning and Research CEQA.net database was also reviewed to identify projects for which notices of preparation or completion of an environmental document were filed with the State Clearinghouse. The study area for the cumulative impacts assessment varies based on the resource affected and considers planned, approved, and recently completed projects.

The following projects were considered in the analysis. The analysis is based on the environmental effects of the proposed projects as described in their approved CEQA documents, aerial photograph review, and general knowledge of the project site:

- **8th Street East/SR 121 Intersection Project:** The project would relieve congestion and make safety improvements at the 8th Street/SR 121 intersection.
• **Route 116 Stage Gulch Road Curve Improvement and Realignment Project:** The project improved 2.9 miles of SR 116 in Sonoma County from Adobe Road in the west to Arnold Drive (2 miles northwest of the SR 116/121 intersection). A Mitigated Negative Declaration was prepared, and construction was completed in 2011.

• **Watmaugh Road Bridge Replacement:** The Sonoma County Transportation and Public Works Department is proposing to replace the Watmaugh Road Bridge over Sonoma Creek (2 miles northwest of the SR 116/121 intersection). This project was covered under a Mitigated Negative Declaration completed in 2012. The project is scheduled for construction in 2019.

• **North Bay Water Recycling Program – Phase 1:** This project is a joint venture between 10 municipal water and sanitation agencies in Marin, Napa, and Sonoma counties to install 153 miles of recycled wastewater pipeline and construct storage reservoirs. The project was covered under an Environmental Impact Report, which was completed in 2009. Construction of Phase 1 is expected to be completed by 2018. In the project vicinity, the pipeline would be installed along Arnold Drive to a point approximately 0.7 mile north of the SR 116/121 intersection, where it would be routed over land to eventually discharge into Schell Slough.

• **Chase Street Bridge Replacement Project at Nathanson Creek:** The City of Sonoma replaced the Chase Street Bridge in 2014 (3.4 miles north of the SR 116/121 intersection). This project was covered under a Mitigated Negative Declaration. The new bridge is a 30-foot-long single-span bridge.

• **Art Fichtenburg’s Tasting Room (15 Fremont Drive):** The project would convert an existing retail building into a tasting room on a 5.09-acre parcel. It is CEQA exempt and has been on hold since 2011.

• **Vineyard Inn (23000 Arnold Drive):** Requested a permit to locate retail space in their existing building. The permit is pending.

• **Anaba Winery (60 Bonneau Road):** Permit has been approved allowing a tasting room to remain onsite.

• **Wagner Road Vineyards (100 Wagner Road):** The project would include construction of a new building approximately 4,000 square feet in size to house a winery with barrel storage and agricultural promotional events. A Mitigated Negative Declaration for the project has been prepared.

• **Schug Winery (602 Bonneau Road):** The project would increase production at an existing winery from 10,000 cases per year to 30,000 cases per year and add a 6,300-square-foot tasting/hospitality building. A Mitigated Negative Declaration for the project is being prepared.
2.4.3 Environmental Consequences

The cumulative impacts analysis focuses on the resources that the project may affect. According to the Caltrans eight-step approach for developing a cumulative impact analysis, if the project would not result in impacts to a resource, it could not contribute to a cumulative impact. Areas of no impact are identified at the beginning of Chapter 2. Resources with the potential to contribute to cumulative impacts are wetlands, tree removal, and California red-legged frog. All other potential impacts were determined to be not significant with the project features and avoidance and minimization measures presented in Chapter 2 and are not considered further.

The projects listed in section 2.4.2 were considered together with the proposed SR 116/121 Intersection Improvements Project for the potential for cumulative impacts. The potential impacts are described by resource area below.

2.4.3.1 Biological Resources

The cumulative Resource Study Area for wetlands, tree removal, and California red-legged frog can be seen in Figure 2.5-1. A discussion of how the Resource Study Area was chosen for each resource is included in the subsections below. Based on the analyses and reviews presented below, no considerable contributions to cumulative impacts to wetlands, tree removals, or California red-legged frog would result from the proposed build alternatives.

Wetlands

Resource Study Area

The cumulative Resource Study Area for wetlands is the area within a 3.5-mile radius of the study area, as shown in Figure 2.5-1. This Resource Study Area was chosen because this area could be reasonably affected by impacts resulting from the proposed project.

Historical Context/Current Status

The current health and historical context of wetlands in the Resource Study Area are difficult to ascertain at this specific location. Historically, wetlands were lost with implementation of development and transportation projects. U.S. Army Corps of Engineers oversees wetland regulation through its Section 404 Nationwide Program to comply with the Clean Water Act. This permit-driven program implements a no-net-loss policy on Waters of the U.S., which includes wetlands, and furthermore requires impacts to be compensated for based on prescribed ratios determined by the U.S. Army Corps of Engineers. Theoretically, fulfillment of permit requirements would tend to improve or sustain the overall health of wetlands and waters of the U.S. The Status and Trends of Wetlands in the Conterminous United States 2004 to 2009 indicates that, nationally, gains during this period contrast with losses recorded during previous periods since 1950. However, the State, at this time, has no current assessment of no-net-loss for the Resource Study Area or elsewhere; therefore, precise trends cannot be established.
Figure 2.5-1: Cumulative Resource Study Area
In observing the current health of the wetlands in the Resource Study Area, they appear to be in good condition, and it does not seem that past projects have significantly affected the wetlands because they are located on undeveloped private property.

Proposed Project Impacts
Table 2.3-5 in Section 2.3.2 shows the impacts to wetlands for both build alternatives. The Roundabout Alternative is anticipated to result in permanent impacts to 1.50 acres of wetlands due to relocation of the existing Park and Ride lot and expansion of the highway to accommodate additional lanes, shoulders, and pedestrian and bicycle facilities. The Signalized Intersection Alternative was estimated to result in permanent impacts to 1.53 acres of wetlands and temporary impacts to 0.21 acre of wetlands due to expansion of the highway to accommodate additional lanes, shoulders, and pedestrian and bicycle facilities and because the study area extends farther north and east under this alternative. The impacts associated with both build alternatives could affect the functions and values of the wetlands by reducing groundwater recharge, increasing flood flow, reducing sediment and nutrient retention areas, reducing the diversity and/or abundance of aquatic species habitat, and reducing uniqueness or potential habitat for special-status species. Most of the permanent wetland impacts associated with the build alternatives consist of placing fill, such as pavement or asphalt, within wetlands, which would eliminate wetland functions and values.

Reasonably Foreseeable Projects
Some of the projects identified in Section 2.4.2 would or will result in impacts to wetlands. They include the Route 116 Stage Gulch Road Curve Improvement and Realignment Project and the North Bay Water Recycling Program – Phase 1. These projects are reasonably foreseeable because they have either gone through or will go through the environmental review process and are assumed to be constructed in the future.

The Route 116 Stage Gulch Road Curve Improvement and Realignment Project resulted in 0.11 acre of permanent impacts and 0.23 acre of temporary impacts to U.S. Army Corps of Engineers jurisdictional wetlands or other waters. Minimization and mitigation measures in the Mitigated Negative Declaration describe best management practices that would be implemented to reduce impacts to wetlands and other waters. Compensatory mitigation for impacts to wetlands and other waters occurred through a combination of onsite wetlands and waters restoration and the purchase of wetland mitigation credits from the Burdell Ranch Wetland Mitigation Bank.

The North Bay Water Recycling Program – Phase 1 did not break down impacts to wetlands by region; however, many avoidance and minimization measures were proposed, including installing the pipeline via trenchless methods, hanging it from bridges, or installing beneath stream crossings via directional drilling or jack and bore methods. The pipeline would be
routed around wetlands for complete avoidance. If wetlands could not be avoided, compensatory mitigation would be provided as required by regulatory permits.

None of the other projects identified in Section 2.4.2 would impact wetlands.

**Cumulative Impacts**

Currently, there is not a cumulative impact to wetlands within the Resource Study Area because past and future projects have or will have to mitigate for impacts to wetlands. These projects would not inhibit the health of wetlands and would not contribute to a cumulative impact of wetlands. In addition, the impacts to wetlands associated with the build alternatives would not contribute to a cumulative impact because appropriate project features, avoidance, minimization, and mitigation measures will be implemented, which would reduce the impacts to less than significant. Based on this analysis and review, under CEQA, no considerable contributions to cumulative impacts to wetlands would result from the proposed build alternatives.

**Tree Removal**

**Resource Study Area**
The cumulative Resource Study Area for tree removal is the area within a 3.5-mile radius of the study area, as shown in Figure 2.5-1. This Resource Study Area was chosen based on the presence of similar native tree communities and potential effects of altered habitat values in these areas on similar plants and wildlife. Due to the lack of data showing the locations of existing native trees, only Oak Woodland in the Resource Study Area could be mapped.

**Historical Context/Current Status**

Historically, native trees have been removed for development and transportation projects. In some cases, this has led to a reduction of native trees and an increase of non-native trees for the purpose of landscaping, primarily along roadways. There are few regulations in place to protect native trees. State Senate Concurrent Resolution No. 17 – Oak Woodlands (California State Assembly 1989) requests State agencies having land use planning duties and responsibilities to assess and determine the effects of their decision or actions within any oak woodlands containing blue, Engelmann, valley, or coast live oaks. In addition, the County of Sonoma Permit and Resource Management Department protects some tree species, including valley oaks. These limited regulations help to preserve and protect existing native tree species and require replacement if any are removed. Past projects in the study area have not affected the trees to a significant degree because there has been little development work along the tree line.

**Proposed Project Impacts**

Both build alternatives would require tree removals, as shown in Table 2.3-1 in Section 2.3.1.2. Approximately 36 native and 74 non-native trees would be removed under the Roundabout
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Alternative, while 49 native and 89 non-native trees would be removed under the Signalized Intersection Alternative. Native trees affected would include coast live oak, valley oak, sycamore, and redwood. The average size of the trees to be removed under both build alternatives is 15.3 inches in diameter at breast height. Both alternatives would also have temporary impacts to trees during construction, including minor pruning or trimming of branches and cutting of minor root systems.

Reasonably Foreseeable Projects

Tree removals are unlikely for the development projects identified in Section 2.4.2 because they primarily involve changing the use of an existing building or constructing a new building, which would not involve a substantial expansion of their existing footprint; however, the transportation projects would involve tree removal in the area. These projects are reasonably foreseeable because they have either gone through or will go through the environmental review process and are assumed to be constructed in the future.

The Route 116 Stage Gulch Road Curve Improvement and Realignment Project required the removal of a significant number of trees. Native trees were replanted at a 5:1 ratio, and non-native trees were replanted at a 1:1 ratio at onsite and offsite locations. The Watmaugh Road Bridge Replacement required the removal of riparian trees. Replacement plantings for native trees will be installed, irrigated, and maintained within the public ROW along Watmaugh Road and Sonoma Creek.

The North Bay Water Recycling Program – Phase 1 included avoidance and minimization measures to reduce impacts to heritage or other significant trees. The avoidance and minimization measures included a preconstruction tree inventory and possible design change to avoid trees. For trees that required removal, replacement trees were proposed to be replanted, irrigated, and monitored for a minimum of 2 years. The Chase Street Bridge Replacement Project at Nathanson Creek required the removal of nine trees. Three methods of compensation were proposed, which included (1) tree replacement at a 1:1 ratio onsite, (2) tree replacement at a 1:1 ratio offsite, or (3) an in-lieu payment of $100 per tree provided that payments would be used for educational projects and/or planting programs.

Cumulative Impacts

Currently, there is no cumulative impact resulting from tree removal within the Resource Study Area because all projects have or will have to mitigate for tree removal. These projects would not inhibit the health of native trees and would not contribute to the cumulative impact of native trees. In addition, the impacts to native trees associated with the build alternatives would not contribute to a cumulative impact because the oak trees being impacted by the build alternatives will be mitigated through replanting onsite at a 1:1 ratio at least, which would reduce the impacts to less than significant. Replacement of other native trees will be replaced at least 1:1
ratio. Based on this analysis and review, under CEQA, no considerable contributions to cumulative impacts to native trees would result from either build alternative.

**California Red-Legged Frog**

**Resource Study Area**

The cumulative Resource Study Area for California red-legged frog is the area within a 2-mile radius of the study area, as shown in Figure 2.5-1. This Resource Study Area is based on the maximum distance at which an individual California red-legged frog could disperse and the reasonable potential for cumulative effects to the species.

**Historical Context/Current Status**

The California red-legged frog requires habitat that consists of both aquatic and riparian elements. Habitat loss and alteration, combined with over-exploitation and introduction of exotic predators, were important factors in the decline of the California red-legged frog in the early to mid-1900s. Continuing threats to the California red-legged frog include direct habitat loss due to stream alteration and loss of aquatic habitat, indirect effects of expanding urbanization, and competition or predation from non-native species. Chytrid fungus (*Batrachochytrium dendrobatidis*) is a waterborne fungus that can decimate amphibian populations and is considered a threat to California red-legged frog populations.

There is a moderate potential for California red-legged frog to occur within the Resource Study Area. There is suitable upland dispersal habitat within the Resource Study Area, but no suitable breeding habitat is present. As past projects have added paving in the study area, the health of the upland dispersal habitat has decreased over time, which has made it more difficult for the species to survive in the Resource Study Area.

**Proposed Project Impacts**

Both build alternatives would result in permanent impacts to California red-legged frog upland habitat: the Roundabout Alternative would result in 4.43 acres of upland dispersal habitat impacts, 3.27 acres of permanent impacts and 1.16 acres of temporary impacts, while the Signalized Intersection Alternative would result in 1.55 acres of permanent impacts and 2.01 acres of temporary impacts. These new impervious surfaces would result in permanent impacts to California red-legged frog upland dispersal habitat, which could make it more difficult for the species to inhabit this area. Mitigation for this impacted habitat will be required at a mitigation bank.

There is no breeding habitat present within the study area; therefore, no permanent impacts to California red-legged frog breeding habitat are anticipated. Direct impacts to individual California red-legged frogs are not anticipated during project operation; however, California
red-legged frog could be captured, injured, or killed by construction-related personnel or equipment during project construction if they enter or are found in the work area.

**Reasonably Foreseeable Projects**

The development projects identified would not impact California red-legged frog upland dispersal habitat because they primarily involve changing the use of an existing building, which would not involve a substantial expansion of their existing footprint. However, the development projects that require construction of a new building have the potential to impact upland dispersal habitat; although there is not sufficient information to determine if they would impact California red-legged frog. Three of the transportation projects identified in Section 2.4.2 are within the 2-mile Resource Study Area and have the potential to affect California red-legged frog. These projects are reasonably foreseeable because they have either gone through or will go through the environmental review process and are assumed to be constructed in the future.

The Route 116 Stage Gulch Road Curve Improvement and Realignment Project included mitigation for impacts to California red-legged frog habitat at a 3:1 mitigation ratio for permanent impacts and a 1:1 ratio of temporary effects. Mitigation bank credits were purchased from a U.S. Fish and Wildlife Service-approved conservation bank. The Watmaugh Road Bridge Replacement Project included avoidance and minimization measures to reduce impacts to California red-legged frog. These included construction outside of the California red-legged frog breeding season, biological monitoring, and relocation by an agency-approved biologist. There is no discussion of compensatory mitigation to California red-legged frog habitat in the CEQA document. The North Bay Water Recycling Program – Phase 1 included avoidance and minimization measures to reduce impacts to California red-legged frog. These included construction outside of the California red-legged frog breeding season and worker awareness training.

**Cumulative Impacts**

Currently, there is no cumulative impact on California red-legged frog within the Resource Study Area because all projects have or will have to mitigate for impacts on California red-legged frog. With implementation of these measures, these projects would not inhibit the health of California red-legged frog or its habitat and would not contribute to the cumulative impact of the species.

Under the proposed project, the California red-legged frog upland dispersal habitat impacted by the build alternatives will be mitigated through the purchase of California red-legged frog credits from a U.S. Fish and Wildlife Service-approved conservation bank, habitat restoration in Sonoma County; contribution to a larger advanced mitigation property acquisition in Sonoma County; habitat management; or other beneficial measure that will aid local recovery
of the species. Because the build alternatives will mitigate for adverse impacts to California red-legged frog, the build alternatives would not contribute to a cumulative impact to California red-legged frog, which would reduce the impacts to less than significant. Based on this analysis and review, under CEQA, no considerable contributions to cumulative impacts to California red-legged frog would result from the proposed build alternatives.

2.4.4 Project Features, Avoidance, Minimization, and/or Mitigation Measures

The build alternatives will implement the project features, avoidance, minimization, and mitigation measures specific to avoid and minimize effects on wetlands, native trees, and California red-legged frog as stated in Section 2.3. Current and past projects would compensate for their impacts to these resource areas or implemented avoidance and minimization measures. It is assumed that these projects would follow through with avoidance and minimization measures. No significant cumulative impacts would occur; therefore, additional avoidance, minimization, and/or mitigation measures are not required.
2.5 Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to greenhouse gas emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of greenhouse gases generated by human activity, including carbon dioxide, methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of greenhouse gas emissions is electricity generation, followed by transportation. In California, however, transportation sources, including passenger cars, light-duty trucks, other trucks, buses, and motorcycles, make up the largest source of greenhouse gas-emitting sources. The dominant greenhouse gas emitted is carbon dioxide, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: “Greenhouse Gas Mitigation” and “Adaptation.” “Greenhouse Gas Mitigation” is a term for reducing greenhouse gas emissions to reduce or “mitigate” the impacts of climate change. “Adaptation” refers to the effort of planning for and adapting to impacts resulting from climate change, such as adjusting transportation design standards to withstand more intense storms and higher sea levels.6

There are four primary strategies for reducing greenhouse gas emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity, (3) transitioning to lower greenhouse gas-emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective, all four strategies should be pursued cooperatively.7

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6 http://climatechange.transportation.org/ghg_mitigation/
7 http://www.fhwa.dot.gov/environment/climate_change/mitigation/
2.5.1 Regulatory Setting

2.5.1.1 State

With the passage of several pieces of legislation, including State Senate and Assembly bills and Executive Orders, California launched an innovative and proactive approach to dealing with greenhouse gas emissions and climate change.

Assembly Bill 1493, Pavley, Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board 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.

Executive Order S-3-05 (June 1, 2005): The goal of this Executive Order is to reduce California’s greenhouse gas emissions to (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below the year 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

Assembly Bill 32, Núñez and Pavley, The Global Warming Solutions Act of 2006: Assembly Bill 32 sets the same overall greenhouse gas emissions reduction goals as outlined in Executive Order S-3-05, while further mandating that the California Air Resources Board create a scoping plan and implement rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.”

Executive Order S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency and state agencies with regard to climate change.

Executive Order S-01-07 (January 18, 2007): This order 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.

Senate Bill 97 Chapter 185, 2007, Greenhouse Gas Emissions: This bill required the Governor’s Office of Planning and Research to develop recommended amendments to the CEQA Guidelines for addressing greenhouse gas emissions. The amendments became effective on March 18, 2010.

Senate Bill 375, Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires the California Air Resources Board to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization for each region must then develop a “Sustainable Communities Strategy” that integrates transportation, land use, and housing policies to plan for the achievement of the emissions target for their region.
Senate Bill 391 Chapter 585, 2009 California Transportation Plan: This bill requires the State’s long-range transportation plan to meet California’s climate change goals under Assembly Bill 32.

2.5.1.2 Federal

Although climate change and greenhouse gas reduction are a concern at the federal level, currently no regulations or legislation have been enacted specifically addressing greenhouse gas emissions reductions and climate change at the project level. Neither the U.S. Environmental Protection Agency nor the Federal Highway Administration has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. The Federal Highway Administration supports the approach that 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 assist in decision making and improve efficiency at the program level, and it will inform the analysis and stewardship needs of project-level decision making. Climate change considerations can 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.

The four strategies outlined by the Federal Highway Administration to lessen climate change impacts correlate with efforts that the state is undertaking to deal with transportation and climate change; these strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in travel activity.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the “National Clean Car Program” and Executive Order 13514 – Federal Leadership in Environmental, Energy and Economic Performance.

Executive Order 13514 (October 5, 2009) is focused on reducing greenhouse gases internally in federal agency missions, programs, and operations, but it also directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

The U.S. Environmental Protection Agency’s authority to regulate greenhouse gas emissions stems from the U.S. Supreme Court decision in Massachusetts v. EPA (2007). The Supreme Court ruled that greenhouse gases meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public

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8 To date, no national standards have been established regarding mobile source greenhouse gases, nor has the U.S. Environmental Protection Agency established any ambient standards, criteria, or thresholds for greenhouse gases resulting from mobile sources.
health or welfare. Responding to the Court’s ruling, the U.S. Environmental Protection Agency finalized an endangerment finding in December 2009. Based on scientific evidence, it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the Supreme Court’s interpretation of the existing Act and U.S. Environmental Protection Agency’s assessment of the scientific evidence that form the basis for U.S. Environmental Protection Agency’s regulatory actions. The U.S. Environmental Protection Agency, in conjunction with the National Highway Traffic Safety Administration, issued the first of a series of greenhouse gas emission standards for new cars and light-duty vehicles in April 2010.9

The U.S. Environmental Protection Agency and the National Highway Traffic Safety Administration are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced greenhouse gas emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever greenhouse gas regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle greenhouse gas regulations.

The final combined standards that made up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards implemented by this program are expected to reduce greenhouse gas emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

On August 28, 2012, the U.S. Environmental Protection Agency and the National Highway Traffic Safety Administration issued a joint Final Rulemaking to extend the National Program for fuel economy standards to model year 2017 through 2025 passenger vehicles. Over the lifetime of the model year 2017-2025 standards, this program is projected to save approximately 4 billion barrels of oil and 2 billion metric tons of greenhouse gas emissions.

The complementary U.S. Environmental Protection Agency and National Highway Traffic Safety Administration standards that make up the Heavy-Duty National Program apply to combination tractors (semi trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses and refuse or utility trucks). Together, these standards will cut greenhouse gas emissions and domestic oil use significantly. This program responds to President Barack Obama’s 2010 request to jointly establish greenhouse gas emissions and fuel efficiency standards for the medium- and heavy-duty highway vehicle sector. The agencies estimate that the combined standards will reduce carbon dioxide emissions by approximately 270 million metric tons and save approximately 530 million barrels of oil over the life of model year 2014 to 2018 heavy-duty vehicles.

2.5.2 Project Analysis

An individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its incremental change in emissions when combined with the contributions of all other sources of greenhouse gas. In assessing cumulative impacts, it must be determined if a project’s incremental effect is “cumulatively considerable” (CEQA Guidelines Sections 15064(h)(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 to make this determination is a difficult, if not impossible, task.

The Assembly Bill 32 Scoping Plan mandated by Assembly Bill 32 includes the main strategies California will use to reduce greenhouse gas emissions. As part of its supporting documentation for the Draft Scoping Plan, the California Air Resources Board released the greenhouse gas inventory for California (forecast last updated: October 28, 2010) (see Figure 2.6-1. The forecast is an estimate of the emissions expected to occur in 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the greenhouse gas inventory for 2006, 2007, and 2008.

![California Greenhouse Gas Emissions Forecast](http://www.arb.ca.gov/cc/inventory/data/forecast.htm)

**Figure 2.6-1: California Greenhouse Gas Forecast**

Source: [http://www.arb.ca.gov/cc/inventory/data/forecast.htm](http://www.arb.ca.gov/cc/inventory/data/forecast.htm).

10 This approach is supported by the AEP: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the U.S. Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).
Caltrans and its parent agency, the Transportation Agency, have taken an active role in addressing greenhouse gas emission reduction and climate change. Recognizing that 98 percent of California’s greenhouse gas emissions are from the burning of fossil fuels and 40 percent of all human-made greenhouse gas emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans, which was published in December 2006.11

**Congestion-Relief Projects**

One of the main strategies in the Caltrans Climate Action Program to reduce greenhouse gas 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 (zero to 25 mph) and speeds over 55 mph; the most severe emissions occur from zero to 25 mph (see Figure 2.6-2). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, greenhouse gas emissions, particularly carbon dioxide, may be reduced.

![Figure 2.6-2: Possible Effect of Traffic Operation Strategies in Reducing On-Road Carbon Dioxide Emission](http://onlinepubs.trb.org/onlinepubs/trnews/trnews268.pdf)

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11 Caltrans Climate Action Program is located at the following Web address:
http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf
This project focuses on improving operations for all modes of transportation at the SR 116/121 intersection. Current traffic operations are limited through the study area due to the stop-controlled intersection, which contributes to long queues along SR 116/Arnold Drive, SR 121/Arnold Drive, and SR 121/Fremont Drive. The build alternatives would improve operations along all intersection legs, reduce congestion and delay, and reduce vehicle queue lengths. When comparing existing conditions to future build conditions, the Traffic Operations Analysis Report estimates that by 2040, the Roundabout Alternative would reduce delay by 4 minutes, 51 seconds per vehicle in the morning peak period and by 5 minutes, 56 seconds per vehicle in the evening peak period. It also estimates that by 2040, the Signalized Intersection Alternative would reduce delay by 4 minutes, 22 seconds per vehicle in the morning peak period and by 5 minutes, 14 seconds per vehicle in the evening peak period. Reductions in delays would also reduce emissions of pollutants, including carbon dioxide. The project is also included in the 2013 Regional Transportation Plan/ Sustainable Communities Strategy and 2015 Transportation Improvement Program, which contain adopted strategies for greenhouse gas emissions from transportation sources. Lastly, the project design would maintain the Park and Ride lot and provide pedestrian and bicycle facilities in the study area, further encouraging alternative modes of transportation.

To evaluate potential greenhouse gas impacts of the build alternatives, future conditions with and without the project were modeled using the CT-EMFAC11 emissions prediction model. Table 2.6-1 demonstrates the potential influence of changes in vehicle speeds and idling time within the study area on carbon dioxide emissions within that area.

<table>
<thead>
<tr>
<th>Alternative / Year</th>
<th>Predicted Emissions of Carbon Dioxide (tons per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Build</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>15,330</td>
</tr>
<tr>
<td>2020</td>
<td>17,155</td>
</tr>
<tr>
<td>2040</td>
<td>23,725</td>
</tr>
<tr>
<td>Roundabout</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>13,505</td>
</tr>
<tr>
<td>2040</td>
<td>17,885</td>
</tr>
<tr>
<td>Signalized Intersection</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>16,790</td>
</tr>
<tr>
<td>2040</td>
<td>22,265</td>
</tr>
</tbody>
</table>

Table 2.6-1 focuses on carbon dioxide emissions. The carbon dioxide emissions values presented in Table 2.6-1 are only useful for a comparison between build and no build alternatives. The estimated emission values are not necessarily an accurate reflection of what the true carbon dioxide emissions will be because carbon dioxide emissions are dependent on other factors that are not part of the model, such as the fuel mix, rate of acceleration, and the aerodynamics and efficiency of the vehicles. However, the general trend shown in Table 2.6-1 – decreases in carbon dioxide emissions under both build alternatives when compared to the No Build Alternative under future conditions – is consistent with the pattern of estimated differences in vehicle speeds and idling time applied as inputs to the emissions analyses.

2.5.3 Construction Emissions

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction greenhouse gas 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. Total carbon dioxide emissions during the construction period were estimated with the Sacramento Metropolitan Air Quality Management District’s Road Construction Emissions Model and are anticipated to be 1,060 tons under the Roundabout Alternative and 1,107 tons under the Signalized Intersection Alternative.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the greenhouse gas 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 2.2.6, Air Quality, 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 the build alternatives would result in a slight increase in greenhouse gas emissions during construction, it is anticipated that any increase in greenhouse gas emissions would be offset by the reduction of greenhouse gas emissions from the operational improvements of the build alternatives. Measures to help reduce greenhouse gas emissions are outlined in the following section.
2.5.4 Greenhouse Gas Reduction Strategies

Caltrans continues to be involved on the Governor’s Climate Action Team as the California Air Resources Board works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in Assembly Bill 32. Many of the strategies Caltrans is using to help meet the targets in Assembly Bill 32 come from former Governor Arnold Schwarzenegger’s Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in greenhouse gas emissions, while accommodating growth in population and the economy. The Strategic Growth Plan relies on a complete systems approach to attain carbon dioxide reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements, as shown in Figure 2.6-3.

![Figure 2.6-3: Mobility Pyramid](image)

Caltrans 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 works closely with local jurisdictions on planning activities, but it does not have local land use planning authority. Caltrans assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars and 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 participating on the Climate Action Team. It is important to note, however, that control of fuel economy standards is held by the U.S. Environmental Protection Agency and the California Air Resources Board.
Caltrans is also working towards enhancing the State’s transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under Senate Bill 375 (Steinberg 2008), Senate Bill 391 (Liu 2009) requires the State’s long-range transportation plan to meet California’s climate change goals under Assembly Bill 32.

The California Transportation Plan is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas emissions. The California Transportation Plan defines performance-based goals, policies, and strategies to achieve our collective vision for California’s future, statewide, integrated, multimodal transportation system.

The purpose of the California Transportation Plan is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the California Transportation Plan 2040 will identify the statewide transportation system needed to achieve maximum feasible greenhouse gas emission reductions while meeting the State’s transportation needs.

Table 2.6-2 summarizes Caltrans and statewide efforts that Caltrans is implementing to reduce greenhouse gas emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Program</th>
<th>Partnership</th>
<th>Method/ Process</th>
<th>Estimated Carbon Dioxide Savings (million metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lead</td>
<td>Agency</td>
<td></td>
</tr>
<tr>
<td>Smart Land Use</td>
<td>Intergovernmental Review</td>
<td>Caltrans</td>
<td>Local governments</td>
<td>Review and seek to mitigate development proposals</td>
</tr>
<tr>
<td></td>
<td>Planning Grants</td>
<td>Caltrans</td>
<td>Local and regional agencies and other stakeholders</td>
<td>Competitive selection process</td>
</tr>
<tr>
<td></td>
<td>Regional Plans and Blueprint Planning</td>
<td>Regional Agencies</td>
<td>Caltrans</td>
<td>Regional plans and application process</td>
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Table 2.6-2: Climate Change/Carbon Dioxide Reduction Strategies

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Program</th>
<th>Partnership</th>
<th>Method/Process</th>
<th>Estimated Carbon Dioxide Savings (million metric tons)</th>
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<tr>
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<td>Caltrans</td>
<td>State Intelligent Transportation System; Congestion Management Plan</td>
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<tr>
<td>&amp; Intelligent Transportation</td>
<td><strong>System Deployment</strong></td>
<td>Regions</td>
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<tr>
<td><strong>System Deployment</strong></td>
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</tr>
<tr>
<td>Mainstream Energy &amp;</td>
<td>Office of Policy Analysis &amp; Research; Division of Environmental Analysis</td>
<td>Interdepartmental effort</td>
<td>Policy establishment, guidelines, technical assistance</td>
<td>Not Estimated</td>
</tr>
<tr>
<td>Greenhouse Gas into Plans</td>
<td></td>
<td></td>
<td></td>
<td>Not Estimated</td>
</tr>
<tr>
<td>and Projects</td>
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<td>Educational &amp; Information</td>
<td>Office of Policy Analysis &amp; Research</td>
<td>Interdepartmental, California</td>
<td>Analytical report, data collection, publication, workshops, outreach</td>
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<td>Program</td>
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<td>Energy Commission</td>
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<tr>
<td>Total</td>
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**Fleet Greening & Fuel**

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<tr>
<th>Diversification</th>
<th>Division of Equipment</th>
<th>Department of General Services</th>
<th>Fleet Replacement B20 B100</th>
<th>0.0045</th>
<th>0.0065</th>
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<td>Green Action Team</td>
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<td>Portland Cement</td>
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<td>4.2</td>
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<td></td>
<td></td>
<td>Industries</td>
<td>25% fly ash cement mix</td>
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<td>Protection Agency, Air</td>
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<td>Transportation and Housing</td>
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<td>Agency, Metropolitan Planning</td>
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<tr>
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<td><strong>Total</strong></td>
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<td>18.18</td>
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</tbody>
</table>
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

Caltrans Director’s Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013)\textsuperscript{12} provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

The following measures will also be included in the project to reduce the greenhouse emissions and potential climate change impacts from the project:

1. Landscaping reduces surface warming, and through photosynthesis, decreases carbon dioxide. The project will include landscaping, as described in Section 2.1.7, Visual/Aesthetics. The landscaping will help to offset potential carbon dioxide emissions.
2. The project will utilize energy-efficient lighting, which will be defined during final design.
3. According to the Caltrans Standard Specifications, the contractor must comply with all local Air Pollution Control District's rules, ordinances, and regulations in regards to air quality restrictions, as described in Section 2.2.6, Air Quality.
4. To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times, as described in Section 2.2.6, Air Quality.
5. Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low sulfur fuel as required by California Code of Regulations Title 17, Section 93114, as described in Section 2.2.6, Air Quality.

2.5.5 Adaptation Strategies

“Adaptation strategies” refer to how Caltrans 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, variability in storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from 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 the transportation infrastructure.

\textsuperscript{12} \url{http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/projects_and_studies.shtml}
At the federal level, the Climate Change Adaptation Task Force, co-chaired by the White House Council on Environmental Quality, the Office of Science and Technology Policy, and the National Oceanic and Atmospheric Administration, released its interagency task force progress report on October 28, 2011\(^\text{13}\), outlining the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision makers manage climate risks.

Climate change adaptation must also involve the natural environment. 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, former Governor Arnold 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. This Executive Order set in motion several agencies and actions to address the concern of sea level rise.

In addition to addressing projected sea level rise, the California Natural Resources Agency was directed to coordinate with local, regional, state, and federal public and private entities to develop The California Climate Adaptation Strategy (December 2009)\(^\text{14}\), which summarizes the best-known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to Executive Order S-13-08 that specifically asked the California Natural Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the California Environmental Protection Agency; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings.

\(^{13}\) [http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation](http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation)

The National Academy of Science was directed to prepare a Sea Level Rise Assessment Report\textsuperscript{15} to recommend how California should plan for future sea level rise. The report was released in June 2012 and included:

- Relative sea level rise projections for California, Oregon, and Washington 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 (e.g., roads, public facilities, and beaches), natural areas, and coastal and marine ecosystems.
- A discussion of future research needs regarding sea level rise.

In 2010, interim guidance was released by The Coastal Ocean Climate Action Team, as well as Caltrans, as a method to initiate action and discussion of potential risks to the state’s infrastructure due to projected sea level rise. Subsequently, the Coastal Ocean Climate Action Team updated the Sea Level Rise guidance to include information presented in the National Academies Study.

All state agencies that are planning to construct projects in areas vulnerable to future sea level rise are directed to consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. Sea level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge, and storm wave data.

All projects that have filed a Notice of Preparation as of the date of Executive Order S-13-08, and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines. A Notice of Preparation was not required for this project. However, the San Francisco Bay area includes approximately 1,000 miles of shoreline; thus, it is vulnerable to a range of natural hazards, including storms, extreme high tides, and projected sea level rise. According to several sea level rise projection maps\textsuperscript{16}, sea level rise in the next century may potentially inundate the land uses and roadway infrastructure within the Bay. The potential for projected sea level rise within the proposed project vicinity in the 2050 and 2100 years may exacerbate existing natural hazards within the project area. A comprehensive planning and adaptation plan approach will


be required through collaboration efforts between Caltrans and local agencies with land use authority to ensure future plans for infrastructure and the surrounding land uses consider sea level rise. In addition, Caltrans will continue to collaborate with Sonoma County, the Metropolitan Transportation Commission, and other regional planning agencies to develop a sea level rise adaptation plan to address future sea level rise.

Caltrans reviewed the most recent available maps from the Pacific Institute, San Francisco Bay Conservation and Development Commission, and the U.S. Geological Survey of the project area and the projected shorelines due to sea level rise. As shown in Figure 2.6-4, the existing intersection is outside the area of direct impacts from flooding potential or projected sea level rise inundation.

Executive Order S-13-08 also directed the Business, Transportation, and Housing Agency (now California Transportation Agency) to prepare a report to assess vulnerability of transportation systems to sea level rise affecting safety, maintenance and operational improvements of the system, and economy of the state. Caltrans continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects; however, without statewide planning scenarios for relative sea level rise and other climate change effects, Caltrans 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, Caltrans will be able to review its current design standards to determine what changes, if any, may be needed to protect the transportation system from sea level rise.

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. Caltrans is an active participant in the efforts being conducted in response to Executive Order S-13-08 and is mobilizing to be able to respond to the National Academy of Science Sea Level Rise Assessment Report.
Figure 2.6-4: Potential for Sea Level Rise in the Study Area
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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. It helps planners determine the necessary scope of environmental documentation and the level of analysis required, and identify potential impacts and avoidance, minimization, and/or 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, interagency coordination meetings, and public information meetings. This chapter summarizes the results of Caltrans’ efforts to fully identify, address, and resolve project-related issues through early and continuing coordination. Copies of agency correspondence are included in Appendix G.

3.1  Agency Consultation

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 listed below. Copies of written consultation with agencies are included in Appendix G unless otherwise noted.

3.1.1 U.S. Fish and Wildlife Service

Caltrans conducted formal consultation with the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service reviewed the project consistent with Section 7 of the Federal Endangered Species Act, focusing on identified or potential impacts to protected plant and wildlife species for both build alternatives as described in Section 2.3.5, Threatened and Endangered Species. Coordination on this project began with a request for, and review of, any information on endangered and threatened species in the project region. On March 4, 2015, project staff, Caltrans, and the U.S. Fish and Wildlife Service met at the project site to discuss the project and special-status species that could occur in the area. It was determined that, because a portion of the study area was unable to be surveyed, potential sensitive plant and wildlife species and habitats discovered in the database searches are assumed to be present in that portion of the study area until more information becomes available. Caltrans consulted with the U.S. Fish and Wildlife Service on the California red-legged frog, vernal pool fairy shrimp, Sonoma sunshine, and Contra Costa goldfields. A Biological Opinion was issued for the project on April 12, 2017 (see Appendix G).

3.1.2 U.S. Army Corps of Engineers

Any filling of wetlands or impacts to the waters of the U.S. or navigable waters requires permit review and approval by the U.S. Army Corps of Engineers consistent with Section 404 of the
Clean Water Act and Section 10 of the Rivers and Harbors Act. Impacts to wetlands are anticipated under both build alternatives, as described in Section 2.3.2, Wetlands and Other Waters of the U.S., which would require the project to obtain an Individual Permit under Section 404 from the U.S. Army Corps of Engineers. The Delineation of Waters of the U.S. was submitted to the U.S. Army Corps of Engineers for their review and verification of the presence of jurisdictional waters on August 4, 2016. A field meeting was held on September 19, 2016, to review the wetlands delineation mapping with Caltrans, SCTA, and a representative of the U.S. Army Corps of Engineers. A preliminary jurisdictional determination was made for the project by the U.S. Army Corps of Engineers on November 28, 2016.

3.1.3 Federal Highway Administration

Federal Highway Administration’s plans, programs, and projects are required to conform to the applicable State Implementation Plan for achieving National Ambient Air Quality Standards. This applies to transportation plans, transportation improvement programs, and projects funded or approved by the Federal Highway Administration or the Federal Transit Administration in areas that do not meet or previously have not met air quality standards for O₃, CO, particulate matter, or NO₂. The project area is exempt from regional conformity analysis requirements, as described in Section 2.2.6, Air Quality. Caltrans will request that the Federal Highway Administration issue a project-level conformity determination for this project prior to completion of the environmental process, confirming that the project conforms to the purpose of the State Implementation Plan for achieving the National Ambient Air Quality Standards.

3.1.4 State Historic Preservation Officer

Federally funded transportation projects must follow Federal Highway Administration and Caltrans procedures for historic preservation. A Programmatic Agreement for compliance with Section 106 of the National Historic Preservation Act would apply to this project. One resource was identified as being eligible for the National Register of Historic Places – the Vineyard Inn Hotel. The Vineyard Inn Hotel would not be adversely affected by the proposed project activities under either build alternative because the project would not change the character of the property’s use of or physical features within the property’s setting that contribute to its historic significance. A letter was sent to the State Historic Preservation Officer on February 11, 2016, to confirm the eligibility determinations of the Vineyard Inn Hotel and the eight other previously unevaluated properties in the area of potential effects. On March 21, 2016, the State Historic Preservation Officer concurred with the findings that the Vineyard Inn Hotel is eligible for the National Register of Historic Places under Criterion C at the local level of significance and that the eight additional properties evaluated are not eligible for the National Register of Historic Places. An additional letter was sent to the State Historic Preservation Officer after
circulation of the Draft Environmental Document on August 23, 2016, requesting concurrence on the finding of No Adverse Effect on cultural resources within the project’s area of potential effects. The State Historic Preservation Officer concurred on the Finding of No Adverse Effect for the Vineyard Inn Hotel and for the project as a whole in a letter dated September 29, 2016 (see Appendix G).

### 3.1.5 State Water Resources Control Board

Projects that disturb one acre or more of soil must obtain coverage under the statewide Construction General Permit (State Water Resources Control Board Order No. 2009-0009-DWQ, amended by 2010-0014-DWQ and 2012-0006-DWQ). To obtain coverage, a Notice of Intent and a Stormwater Pollution Prevention Plan will be filed with the State Water Resources Control Board prior to the commencement of construction.

### 3.1.6 Regional Water Quality Control Board

The project will obtain a Section 401 permit from the Regional Water Quality Control Board during the final design phase of the project. Under Section 401 of the Clean Water Act, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are Clean Water Act Section 404 permits issued by the U.S. Army Corps of Engineers. The 401 permit certifications are obtained from the appropriate Regional Water Quality Control Board, dependent on the project location, and are required before the U.S. Army Corps of Engineers issues a 404 permit.

### 3.1.7 State Clearinghouse

A Notice of Completion transmitting the Draft Environmental Document was filed with the State Clearinghouse on June 28, 2016.

### 3.1.8 Air Quality Conformity Task Force

Interagency consultation with the Air Quality Conformity Task Force was conducted on December 3, 2015. It was determined that the project does not fit the definition of a project of air quality concern as defined by 40 CFR 93.123(b)(1) or 40 CFR 93.128 and therefore is not subject to PM2.5 project-level conformity requirements (see Appendix G).

### 3.2 Public Participation

#### 3.2.1 Early Informational Meeting

SCTA conducted an early informational meeting with the public on November 5, 2014, at the Schell-Vista Fire Station at 22950 Broadway Street in Sonoma County. The purpose of the
meeting was to provide early consultation with the public and project stakeholders for this proposed project. An informational postcard mailer was sent to all properties located within 0.5 mile of the project intersection, and owners and occupants of properties in the Temecula community located approximately 3 miles north of the intersection. The mailing included approximately 1,400 addresses. Approximately 50 attendees signed in, many of whom were residents and owners of adjacent and nearby properties and businesses.

Seven informational stations were set up, allowing members of the public to speak directly with project representatives from Caltrans, SCTA, and consultant staff. Some common questions and comments received informally by members of the project team during their conversations with meeting attendees included support for making improvements to the intersection and concern that traffic congestion has substantially increased in the project vicinity. Other comments included safety concerns about the speed of cars entering the free right turn at Fremont Drive, access concerns at adjacent properties, and appropriate informational signage.

### 3.2.2 Public Meeting

The project team provided an open house meeting with the release of the Draft Environmental Document. It was held on Wednesday, July 13, 2016, at the Finnish American Home Association, 197 West Verano Avenue, Sonoma County, from 5:00 to 7:00 p.m. Caltrans and SCTA staff were present to discuss the proposed project’s design features and environmental aspects and to answer questions. Approximately 40 attendees signed in, many who were local residents and business owners.

An informational postcard was mailed on June 29, 2016, to all residents and businesses within 0.5 mile of the SR 116/121 intersection, including the residents of Temecula. The mailing included approximately 1,336 addresses. Public notices were published in the *Sonoma Index Tribune* on July 5, 2016, and the *Petaluma Argus-Courier* on July 7, 2016.

Members of the public had the opportunity to comment on the project during public circulation of the Draft Environmental Document. Comments were submitted via e-mail and post mail to Arnica MacCarthy, Associate Environmental Planner at the Department of Transportation, Office of Environmental Analysis, P.O. Box 23660, MS 8B, Oakland, CA 94623, or via e-mail to Arnica.MacCarthy@dot.ca.gov. The comment period ended August 2, 2016. Copies of the 21 comments received during the comment period and responses to each comment are included in Appendix I. Comments received included concerns about design of the roundabout, access modifications, and general support for the project. The Public Meeting Summary Report is included in the List of Technical Studies.
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 was responsible for oversight of the project and consists of representatives from Caltrans, SCTA, and the Parsons team.

Key Project Development Team Members

- Betsy Joseph, Regional Project Manager, Office of Program/Project Management, Caltrans District 4
- Eric Schen, Project Manager, Office of Program/Project Management Caltrans District 4
- Jonathan Lee, Senior Transportation Engineer, Office of Design, Caltrans District 4
- Phil Cox, Senior Transportation Engineer, Office of Traffic Forecasting, Caltrans District 4
- David Guevara, Transportation Engineer, Office of Highway Operations, Caltrans District 4
- Patrick Lin, Transportation Engineer, Office of Design, Caltrans District 4
- Eric DeNardo, Branch Chief, Office of Environmental Analysis, Caltrans District 4
- Arnica MacCarthy, Acting Branch Chief, Office of Environmental Analysis, Caltrans District 4
- Seana Gause, Senior Project Manager, Programming and Projects, SCTA
- Rodney Pimentel, Project Manager, Parsons
- John Kenyon, Engineering Manager, Parsons
- Stephanie Blanco, Environmental Manager, Parsons
- Carie Montero, Environmental Manager, Parsons
- Ron Boyle, Geometrics, Omni-Means
- Kamesh Vedula, Traffic, Omni-Means

List of Caltrans Reviewers

- Melanie Brent, Deputy District Director, Division of Environmental Planning and Engineering
- Jo Ann Cullom, Office Chief, Office of Biological Sciences and Permits
- Stefan Galvez, Office Chief, Office of Environmental Analysis
- Robert Blizard, Branch Chief, Office of Biological Sciences and Permits
- Ray Boyer, Branch Chief, Office of Environmental Engineering
- Eric DeNardo, Branch Chief, Office of Environmental Analysis
- Brian Gassner, Branch Chief, Office of Environmental Analysis
- Norman Gonsalves, Branch Chief, Office of Water Quality
- Jamie Le Dent, Branch Chief, Office of Environmental Analysis
• Frances Malamud-Roam, Branch Chief, Office of Biological Sciences and Permits
• Arnica MacCarthy, Acting Branch Chief, Office of Environmental Analysis
• Chris Pincetich, Branch Chief, Office of Biological Sciences and Permits
• Kathleen Reilly, Branch Chief, Office of Hydraulic Engineering
• Kathryn Rose, Branch Chief, Office of Cultural Resource Studies – Archaeology
• Sergio Ruiz, Branch Chief, Office of Transit and Community Planning
• Noah Stewart, Branch Chief, Office of Cultural Resources, Built Environment/Architectural History
• Chris Wilson, Branch Chief, Office Environmental Engineering
• Evelyn Gestuvo, Senior Transportation Engineer, Office of Traffic Operations
• Andy Amacher, Associate Environmental Planner – Biology, Office of Biological Sciences and Permit
• Matt Gaffney, Engineering Geologist, Office of Geotechnical Design
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• Kristina Montgomery, Associate Environmental Planner – Archaeology, Office of Cultural Resources – Archaeology
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Chapter 6  References


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