FINAL
VOLUME I – REVISIONS TO THE DRAFT ENVIRONMENTAL IMPACT REPORT

CEQA ENVIRONMENTAL IMPACT REPORT

SIR FRANCIS DRAKE BOULEVARD REHABILITATION PROJECT

MARIN COUNTY, CALIFORNIA

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1.0 INTRODUCTION

1.1 PURPOSE OF THE EIR

In compliance with the California Environmental Quality Act (CEQA), this report describes the environmental consequences of the Sir Francis Drake Boulevard (SFDB) Rehabilitation Project proposed for Sir Francis Drake Boulevard between Highway 101 and Ross Terrace in the County of Marin. This Environmental Impact Report (EIR) is designed to inform County decision-makers, responsible agencies, and the general public of the proposed project and the potential physical consequences of project approval. This EIR also examines alternatives to the proposed project and recommends mitigation measures to reduce or avoid potentially significant physical impacts. The County of Marin is the Lead Agency for environmental review of the proposed project. This EIR will be used by the County of Marin and the public in their review of the proposed project and associated approvals described in Chapter 3.0.

1.2 PROPOSED ACTION

The project considered in this EIR is the Sir Francis Drake Boulevard Rehabilitation Project (proposed project). The project would rehabilitate approximately two miles of SFDB between the State of California Department of Transportation's right-of-way just west of Highway 101 and the Ross Town limits in Marin County (Figure 1.1). The proposed project would include several elements to reduce traffic congestion, improve pavement condition, and enhance safety for motorists, bicyclists, pedestrians, and transit users. Furthermore, the project would upgrade the public water main operated by Marin Municipal Water District (MMWD) along SFDB. Proposed improvements are generally located within the public right-of-way of the County of Marin and include:

- Roadway pavement rehabilitation within the project limits.
- Intersection geometry modifications, including adding or reconfiguring turn lanes as well as removal or relocation of medians.
- Modernization of traffic signal equipment, including revisions to traffic phasing, timing, and improved synchronization along the corridor.
- Installation of conduits and related appurtenances for a future adaptive traffic signal system and a broadband communication network.
- Revised pavement striping and signage designed to improve safety for motorists, pedestrians, and bicyclists.
- Sidewalk widening and crosswalk enhancements designed to improve pedestrian safety and access.
- Replacement of water supply mains operated by MMWD in portions of the project corridor.

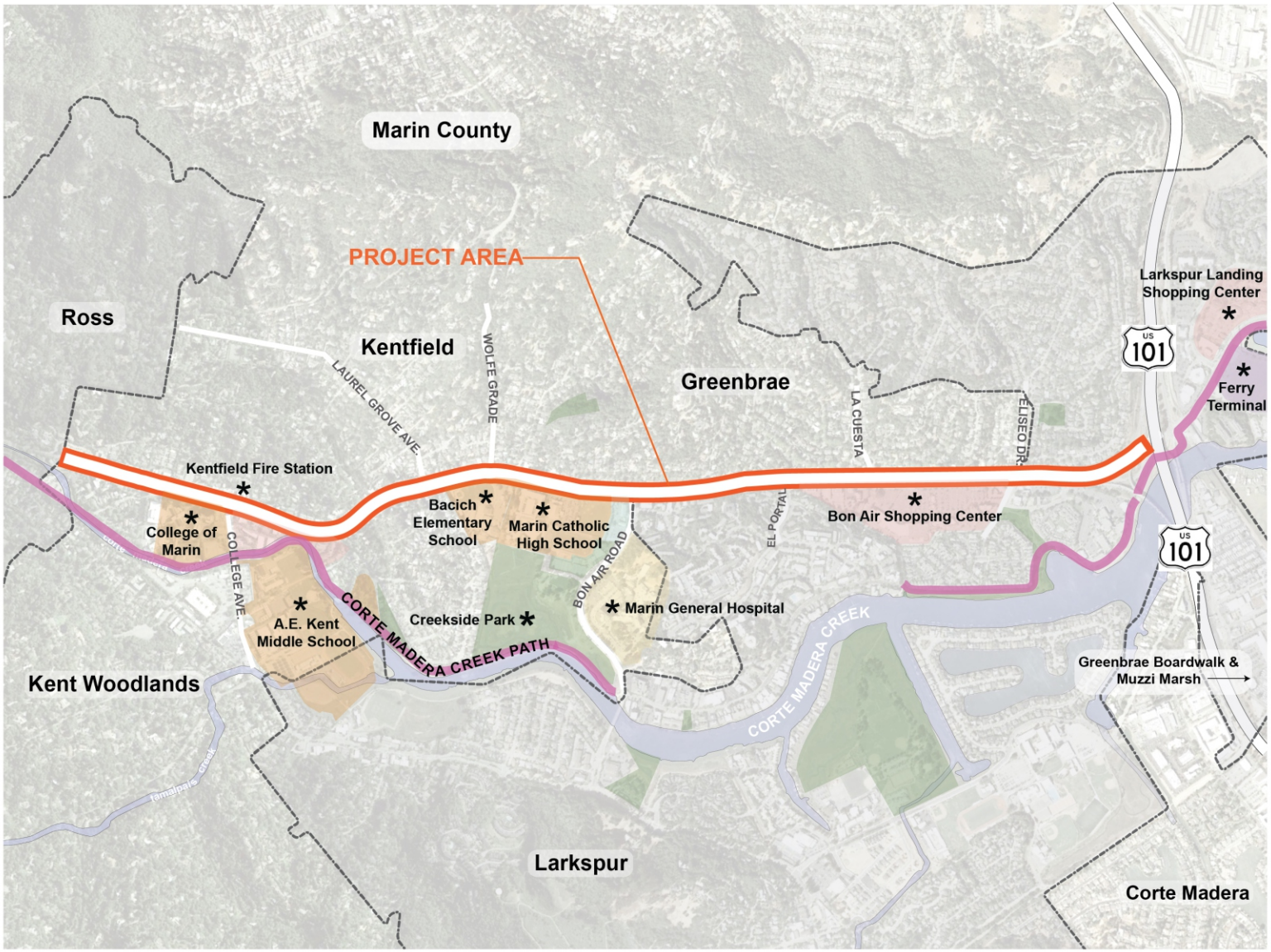

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FIGURE 1.1

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Project Location

P:\BKF1501\g\EIR\Figure 3.2_Project Location.cdr (5/8/2017)

- Accessibility improvements in compliance with the Americans with Disabilities Act (ADA).
- Installation of drainage improvements to accommodate intersection revisions.
- Replacement of landscaping and irrigation systems disrupted by the project.

All of these elements define the proposed project considered in this EIR. However, funding may not be sufficient to complete all of the elements. With the currently available funding, construction of the basic project elements, including pavement rehabilitation, intersection modifications, accessibility improvements, and waterline replacement, is planned over a 2-year period generally commencing in the spring and ending in late summer to minimize traffic impacts.

1.3 CONTENTS OF THE EIR

This EIR is organized into the following chapters:

- *Chapter 1 – Introduction*: Discusses the overall EIR purpose, provides a summary of the proposed project and the environmental impact report scope, and summarizes the organization of the EIR.
- *Chapter 2 – Summary*: Provides a summary of the proposed project and the impacts that would result from implementation of the proposed project, and describes mitigation measures recommended to reduce or avoid significant impacts. Also provides a discussion of alternatives to the proposed project.
- *Chapter 3 – Project Description*: Provides a description of the project site, site development history, project objectives, required approval process, and details of the project itself.
- *Chapter 4 – Setting, Impacts, and Mitigation Measures*: Describes the following for each environmental technical topic: existing conditions (setting), potential environmental impacts and their level of significance, and measures to mitigate identified impacts. Potential adverse impacts are identified by levels of significance, as follows: less-than-significant impact (LTS), significant impact (S), and significant and unavoidable impact (SU). The significance of each impact (after mitigation) is categorized before and after implementation of any recommended mitigation measure(s).
- *Chapter 5 – Alternatives*: Provides an evaluation of alternatives to the proposed project in addition to the No Project alternative.
- *Chapter 6 – CEQA Required Assessment Conclusions*: Provides additional specifically required analyses of the proposed project's growth-inducing effects, significant irreversible changes, cumulative impacts, and effects found not to be significant.
- *Chapter 7 – Report Preparation and References*: Identifies preparers of the EIR, references used, and persons and organizations contacted.

- *Chapter 8 – Acronyms and Glossary of Terms*: Provides a list of acronyms and a glossary of terms frequently used in this EIR.

1.4 PUBLIC REVIEW AND COMMENTS

The County of Marin circulated a Notice of Preparation (NOP) notifying responsible agencies and interested parties that an EIR would be prepared for the project and indicating the environmental topics anticipated to be addressed in this EIR. The NOP was published on November 19, 2016 (Appendix A). The NOP was mailed to public agencies, organizations, and individuals likely to be interested in the potential impacts of the project. Comments on the NOP were received by the County and considered during preparation of the EIR. A scoping session for the Draft EIR was held as a public meeting on January 10, 2017. A total of 22 comment letters/emails regarding the NOP were received in addition to the oral comments made at the public hearing. A summary table of written and oral comments received during the scoping period and a reference to where the issue is addressed in the EIR is included in Appendix B. Copies of the written and oral comments received are included in Appendix C.

The following environmental topics are addressed in this EIR: Land Use and Policy Consistency, Aesthetics, Biological Resources, Cultural Resources, Geology and Soils, Hydrology and Water Quality, Hazards and Hazardous Materials, Traffic and Circulation, Air Quality, Noise, Public Services and Utilities, and Global Climate Change. The topics of Agricultural Resources, Mineral Resources, and Population and Housing will not be analyzed in detail in the EIR, because the proposed project was found to have no impacts related to these topics. The findings for these topics are summarized in Section 6.5, Effects Found Not to Be Significant.

1.5 EIR PROCESS

The~~is~~ Draft EIR ~~will be~~ was made available for review by public agencies, private organizations, and the general public for a 45-day comment period. The start date of the public comment period ~~is~~was included in the Notice of Availability (NOA). During the comment period, the public ~~is~~was invited to submit written comments on the Draft EIR to the Marin County Community Development Agency:

Rachel Reid, Environmental Planning Manager
Marin County Community Development Agency
3501 Civic Center Drive, Suite 308
San Rafael, CA 94903

The Marin County Board of Supervisors ~~will~~ scheduled a public hearing to receive comments on the adequacy of the Draft EIR during, but before the close of, the 45-day public comment period. Notice of the public hearing ~~is~~was provided in compliance with State law and the County's procedures. The public ~~is~~was invited to attend the public hearing to offer oral comments on the adequacy of the Draft EIR.

Following the close of the 45-day comment period, a Response to Comments document ~~will be~~ was prepared to respond to all substantive comments received on the Draft EIR related to environmental issues surrounding the project. The Response to Comments document ~~will~~ also makes revisions to the Draft EIR, as necessary, in response to these comments or to clarify any previous errors,

omissions, or misinterpretations of material in the Draft EIR. The Response to Comments document, together with the Draft EIR, will constitute the Final EIR. Notice of Availability (NOA) of the Final EIR will be provided in compliance with the Marin County Environmental Review Guidelines. The County's procedures provide a period of 14 days for written comments to be submitted on the Final EIR. After the close of the 14-day comment period, a hearing will be held before the Board of Supervisors to consider certification of the Final EIR. Notice of the public meeting to consider certification of the Final EIR will be provided in compliance with State law and the County's procedures. In certifying the EIR, the Board would be affirming that the EIR is adequate and complete pursuant to CEQA and the County Environmental Review Guidelines. In conjunction with a decision on the project, the Board would also find that it reviewed and considered the information contained in the Final EIR prior to taking action on the project.

No action can be taken to approve the proposed project until the Final EIR has been certified. However, certification of the EIR does not require nor ensure approval of the project. Once the EIR is certified, the Board may consider approval of the project. At that time, the Board may decide to approve the project with mitigation measures specified in the Final EIR incorporated as conditions of approval; to disapprove the project; or to approve an alternative to the project that has been evaluated in the Final EIR.

1.6 DOCUMENTS INCORPORATED BY REFERENCE IN THE EIR

- Marin Countywide Plan (2007)
- Marin County Development Code (2013)
- Marin County Unincorporated Area Bicycle and Pedestrian Master Plan (2008)
- City of Larkspur General Plan (1990)
- City of Larkspur Municipal Code (2017)
- City of Larkspur Bicycle and Pedestrian Master Plan (2004)
- City of Larkspur Climate Action Plan (2010)
- CEQA Guidelines (2016)
- Bay Area Air Quality Management District (BAAQMD) *CEQA Air Quality Guidelines* (2017)

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2.0 SUMMARY

This section provides an overview of the analysis contained in Chapter 4.0, Setting, Impacts, and Mitigation Measures. CEQA requires a summary to include discussion of: 1) potential areas of controversy; 2) significant impacts; 3) recommended mitigation measures; and 4) alternatives to the proposed project. As such, this section includes a brief synopsis of the proposed project and project alternatives, environmental impacts and mitigation measures, cumulative effects, areas of known controversy, and issues to be resolved in the Environmental Impact Report (EIR). Table 2.11.A presents a summary of potential environmental impacts, their level of significance before mitigation, mitigation measures, and levels of significance with mitigation.

2.1 SUMMARY OF THE PROPOSED PROJECT

This EIR has been prepared to evaluate the environmental impacts of the proposed Sir Francis Drake Boulevard Rehabilitation Project (proposed project). The project would rehabilitate approximately two miles of SFDB between Highway 101 and the Ross Town limits in Marin County. Project components include: roadway repaving; intersection geometry and striping modifications; installation of pedestrian, bicyclist, and ADA improvements; installation of drainage improvements; and replacement and installation of water supply mains in conjunction with MMWD. A detailed description of the proposed project is provided in Chapter 3.0, Project Description.

2.2 SUMMARY OF SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

As discussed in Chapter 4.0 of this EIR, the proposed project would not result in any significant unavoidable impacts. Significant impacts have been identified in: aesthetics; air quality; biological resources; cultural resources; geology and soils; hazards and hazardous materials; noise; public services; and traffic and circulation. However, these impacts can be reduced to a less-than-significant level with implementation of the mitigation measures identified in this EIR.

2.3 SUMMARY OF GROWTH-INDUCING IMPACTS

Growth-inducing impacts of the proposed project are discussed in Chapter 6.0 of this EIR. The discussion concludes that, because the project would rehabilitate the existing roadway and would not accommodate additional traffic demand or extend or expand infrastructure or services to existing undeveloped areas in the vicinity of the roadway, the project is not expected to be substantially growth inducing, although it would improve roadway conditions and water infrastructure within this segment of SFDB.

2.4 SUMMARY OF CUMULATIVE IMPACTS

Chapter 6.0 of this EIR describes the environmental impacts of the proposed project in combination with projects in unincorporated Marin County. As described in Chapter 6.0, the project would have the following cumulative impacts:

- **Aesthetics.** Implementation of the proposed project, combined with the development of other past, present, and reasonably foreseeable future projects in the area, would not result in a cumulatively considerable impact to aesthetics. As discussed in Section 4.1, Aesthetics, the

project would not result in any significant and adverse impacts to scenic vistas, to scenic resources within a scenic highway, or to the visual character of the site and surroundings. Nighttime construction would introduce a new source of nighttime lighting to the project area; however, mitigation measures included in Section 4.1 would ensure that construction lighting is installed to reduce the cumulative impact of light spillage from the proposed project. Other cumulative projects identified in the area would re-develop properties or construct new facilities on currently vacant land, resulting in similar landscape changes. However, these projects would not substantially change the visual character of the project area given the already highly urbanized nature. These projects may also introduce new sources of light and glare that could affect nighttime views in the project area. Like the proposed project, these projects would be required to prepare lighting plans that ensure exterior lighting would be shielded from adjacent uses.

- **Air Quality.** The proposed project would not exceed the daily or annual emission thresholds established by the Bay Area Air Quality Management District (BAAQMD). Therefore the proposed project would not result in a cumulatively considerable contribution to regional air quality impacts, and the cumulative impact would be less than significant.

- **Biological Resources.** Implementation of the proposed project would result in the loss of existing wetlands (roadside ditch), removal of riparian vegetation along Wolfe Grade Creek, and could adversely affect the habitat and populations of special-status animal species, including nesting birds, salmonids, bats, and several reptile and amphibian species. Project impacts to these resources would be reduced to less-than-significant levels with implementation of the mitigation measures in Section 4.3, Biological Resources. Other past, present, and reasonably foreseeable future projects in the area would be also located in an existing, highly developed, urbanized environment that significantly lowers their potential to contain biologically sensitive resources. These project areas would have the potential to support similar urban adapted special-status species and wetland features (e.g., roadway ditches). Due to the urbanized nature of the area, no cumulative impacts to biological resources are likely to occur from the proposed project or other approved projects that have been identified. Therefore, the proposed project would not result in a considerable contribution to any cumulative impacts to biological resources.

- **Cultural Resources.** Construction activities associated with the proposed project could result in significant impacts to archaeological and paleontological resources and human remains. The proposed project's impacts to these resources would be reduced to less-than-significant levels with implementation of the mitigation measures in Section 4.4, Cultural Resources. Other cumulative projects would be subject to similar CEQA/NEPA review to identify any potential site-specific cultural resources and would be required to mitigate potential impacts pursuant to the goals and policies of the Marin Countywide Plan (CWP) and the City of Larkspur General Plan, along with applicable State regulations. Implementation of these measures would ensure that cumulative impacts to cultural or paleontological resources from other development projects in the City, region, or State are avoided or mitigated. Therefore, the proposed project would not result in a considerable contribution to cumulative impacts to cultural or paleontological resources.

- **Geology and Soils.** The proposed project is located in an area that is subject to earthshaking, liquefaction, soil erosion, and landslides. The cumulative impacts associated with these geologic phenomena would be confined to the project vicinity and would be reduced to less-than-significant levels with implementation of the mitigation measures recommended in Section 4.5, Geology and Soils. Geologic hazards related to future development are site specific and relate to the type of structures and foundation types proposed, as well as soil composition and slope. Other relevant cumulative projects in the vicinity would be expected to identify and mitigate, to the extent feasible, their respective impacts related to geology, soils, and seismicity, similar to the proposed project. Such mitigation measures would help minimize cumulative impacts generally.

- **Global Climate Change**. The project would not interfere with any plan or regulation intended to reduce greenhouse gas (GHG) emissions as the project would not generate new automobile trips. GHG emissions as a result of project construction activities would be mitigated to less than significant with implementation of mitigation measures identified in Section 4.7, Global Climate Change. Given the project's consistency with the Marin County CAP and City of Larkspur CAP and the nature of the project (roadway improvements), the proposed project would not result in a cumulatively considerable contribution to greenhouse gas emissions with the implementation of measures that are proposed as part of the project, and required by State or local regulations.

- **Hazards and Hazardous Materials**. Excavation of soils and associated construction activities of the project could result in the release of lead-based paint and residual groundwater contamination from four leaking underground storage tank sites located adjacent to the project site. Given the location of these four known sites, it is reasonably foreseeable that other projects in the immediate vicinity could also encounter residual groundwater contamination. Implementation of mitigation measures identified in Section 4.8, Hazards and Hazardous Materials, would reduce impacts related to the potential extraction of residual groundwater contamination. Furthermore, the project would be required to adhere to all applicable laws and regulations and would be subject to similar mitigation measures to ensure impacts are less than significant. Therefore, the project's contribution to any potential cumulative impact would not be considerable.

- **Hydrology and Water Quality.** Stormwater discharges are affected by urban pollutants that contribute to the degradation of the water quality of Corte Madera Creek and the Central San Francisco Bay. Urban pollutants in stormwater include petroleum hydrocarbons, sediments, metals, pesticides, and trash. Past, current, and reasonably foreseeable projects in the vicinity of the project site could result in cumulative impacts associated with stormwater discharges, similar to the potential impacts from construction. The project would not use, handle, store, or substantially generate any of the compounds or constituents contributing to the impaired status of the above water bodies, with the exception of trash that may be generated during construction activities. The proper storage and disposal of trash during construction of the project as required by the applicable regulations as described above would ensure that the project would not have a cumulatively considerable impact on water quality.

- **Land Use and Planning Policy.** Development of the proposed project would be consistent with the Marin CWP, the City of Larkspur General Plan, and the overall vision for development in this area of the County. The proposed project entails rehabilitation of an existing roadway; it does not propose any changes to land use, and would not contribute to or cause unplanned growth or result in any considerable contribution to any land use conflicts. As the project is rehabilitating an existing roadway with enhanced pedestrian/bicycle facilities, the project would not result in any changes to existing or long-term land use patterns. Consequently, the proposed project and related developments are not expected to result in substantial unplanned changes to the long-term patterns of land use, and thus no cumulative impact related to land use and planning would occur.

- **Noise.** The proposed project would not result in increased traffic volumes and therefore would not generate a substantial long-term noise level increase. The project would also not significantly increase traffic noise due to roadway relocation. Construction of the proposed project would result in short-term noise impacts on adjacent residential uses; however, construction noise would be short term and Mitigation Measure NOI-1 would reduce the construction noise impacts to the extent feasible. Therefore, the project's construction activities would not be considered a cumulatively considerable contribution to the total noise environment in the project vicinity and this impact would be less than significant. Therefore, the proposed project's contribution to cumulative noise impacts is not significant or considerable.

- **Public Services and Recreation.** No increased demand for the physical expansion of these services would occur as a result of the project as it is rehabilitating an existing road and replacing existing water pipelines and not introducing a new residential population that these public services aid. As described in Section 4.12, Public Services and Recreation, temporary lane closures and traffic rerouting during construction could incrementally increase fire and police response times. Implementation of mitigation measures identified in Section 4.12, Public Services and Recreation, and Section 4.13, Traffic and Circulation, would reduce potential construction impacts to less than significant.

  Cumulative projects in Marin County could increase demand for police and fire services. This increased demand could compromise the emergency response times of the police and fire departments. The Marin CWP and City of Larkspur General Plan require public services and utilities to be maintained at adequate service ratios and service levels through compliance with applicable General Plan policies and applicable State and local regulations, and fair-share contributions by new developments. Other cumulative projects would also be required to allow emergency responders to maintain adequate emergency response times, as required by the Marin CWP and City of Larkspur General Plan. Therefore, adherence to these policies and regulations would ensure that the project and other cumulative development projects would not result in significant impacts to public services and utilities. As a result, the project would not result in a considerable contribution to cumulative impacts to public services or utilities.

- **Transportation and Circulation.** The cumulative traffic volumes were analyzed with existing intersection geometrics and proposed intersection geometrics to identify future travel times and intersection delay. Rehabilitation of the roadway would improve vehicle travel through the

project corridor while also enhancing bicycle and pedestrian circulation through improved facilities. Other foreseeable projects in the project area could generate increased vehicle traffic along the arterials in the project area, contributing to cumulative traffic impacts. However, because the proposed project would improve traffic conditions in the project area, the proposed project will not contribute to cumulative traffic impacts.

Construction activities associated with the proposed project could result in traffic delays, safety concerns, and pavement damage created by construction traffic. There is a potential for other projects in the area to have construction periods occurring simultaneously with the project, compounding construction-related traffic delays and/or congestion. However, construction-related traffic impacts would be localized to the project area and would be reduced to less-than-significant levels with implementation of Mitigation Measure TR-1. Therefore, the proposed project's incremental contribution to transportation and circulation impacts would not be cumulatively considerable and the cumulative impact is less than significant.

- **Utilities and Service Systems.** Implementation of the proposed project would not require the extension of water supply or wastewater conveyance infrastructure into the project site nor would it increase demand for water, wastewater treatment, or solid waste disposal. Although on-site infrastructure improvements could be required to provide a range of utilities to cumulative projects in Marin County, associated impacts would generally be site-specific. Therefore, the proposed project's incremental contribution to public services and utilities impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

2.5 SUMMARY OF PLAN AND POLICY CONSISTENCY

Section 4.1, Land Use, of this EIR presents an evaluation of the project's consistency with the Marin Countywide Plan, the Marin County Development Code (Zoning and Subdivision Regulations), and the Marin County Unincorporated Area Bicycle and Pedestrian Master Plan. That analysis concludes that the proposed project would be consistent with applicable policies and regulations (see Section 4.9 for details). The County decision-makers would need to review the project to determine whether the project is consistent with all policies and whether changes to the project would be required in order to provide the required consistency (see the subsequent discussion in Section 4.9 regarding Issues to Be Resolved for further discussion of these potential inconsistencies).

2.6 EFFECTS FOUND NOT TO BE SIGNIFICANT

Under CEQA, a significant effect on the environment is defined as: a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, noise, and objects of historic or aesthetic significance.[1]

As discussed in Chapter 4.0 of this EIR, implementation of the proposed project has the potential to result in adverse environmental impacts in several areas. Impacts associated with the following

[1] CEQA Sections 21060.5 and 21068.

environmental topics would be significant without the implementation of mitigation measures, but would be reduced to a less-than-significant level if the mitigation measures recommended in this EIR are implemented:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Global Climate Change
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Public Services and Recreation
- Traffic and Circulation

Impacts associated with the following environmental topics would be considered less than significant and would not require any mitigation measures based on the identified criteria of significance:

- Land Use
- Utilities and Service Systems

2.7 SUMMARY OF ALTERNATIVES ANALYSIS

The following alternatives to the proposed project are considered in this EIR:

- The **No Project Alternative** assumes that the proposed roadway improvements and water pipeline replacement would not be implemented as part of the SFDB Rehabilitation Project. Existing traffic and roadway conditions would continue. The County would continue to maintain and repair the roadway on an as needed and ad hoc basis. The roadway design life would not be extended and safety would not be enhanced. MMWD would initiate a separate, independent pipeline replacement project. Although some impacts associated with construction would be reduced or avoided by the smaller scale repairs of the roadway and pipeline under the No Project Alternative, the environmental benefits of the project, such as traffic, pedestrian and

bicycle improvements, would not be realized. In general, the No Project Alternative would not achieve the project objectives.

- The **General Maintenance Alternative** includes pavement rehabilitation, re-striping of the roadway, replacing water pipelines, installing conduits for a future adaptive signal system, upgrading intersections to comply with current accessibility standards (including adding a crosswalk at the Wolfe Grade intersection), replacing the existing metal beam guardrail with a fence, and updating the signal timing to current standards. Although some impacts associated with construction would be reduced or avoided due to the reduced area of construction under this alternative, it does not reconfigure the intersections to operate more efficiently; therefore vehicle travel times through the corridor will not decrease. Thus, the General Maintenance Alternative does not achieve the project objective of congestion relief.

- The **Congestion Relief Alternative** includes intersection modifications to improve efficiency as well as add the third eastbound travel lane between El Portal Drive and Highway 101. Except in locations where re-paving would be necessary to accommodate the intersection modifications, the County would continue to maintain and repair the roadway on an as needed and ad hoc basis. The entire roadway's design life would not be extended. MMWD would initiate a separate, independent pipeline replacement project preceding the SFDB Rehabilitation project. Although some impacts associated with construction would be reduced or avoided by the smaller scale roadway reconfiguration, project benefits including pavement rehabilitation as well as pedestrian and bicycle improvements would not be realized. In general, the Congestion Relief Alternative would not achieve the project objectives.

- The **Corridor Pedestrian and Bicycle Improvements Alternative** includes the multi-use corridor between Eliseo Drive and Bon Air Road, widening of the sidewalk along Bacich Elementary School's frontage, closing the sidewalk gap along the Marin Catholic High School frontage, and improving the pedestrian connection between Manor Road and Wolfe Grade. This alternative would also include minor safety improvements at several intersections with SFDB including Elm, Ash, West McAllister, and Laurel Grove Avenues. The roadway design life would not be extended. MMWD would initiate a separate, independent pipeline replacement project preceding the SFDB Rehabilitation project. Finally, the alternative does not reconfigure the intersections to operate more efficiently; therefore vehicle travel times through the corridor will not decrease. Although some impacts associated with construction would be reduced or avoided due to the reduced area of construction under this alternative, the Corridor Pedestrian and Bicycle Improvements Alternative does not achieve the project objective of congestion relief and pavement rehabilitation.

- The **No Pipeline Alternative** would not replace MMWD water pipelines along SFDB as part of the SFDB Rehabilitation project. MMWD would initiate a separate, independent pipeline replacement project preceding the SFDB Rehabilitation project. Although some impacts associated with construction would be reduced or avoided due to the reduced area of construction, this alternative does not achieve the project objective of improved water system reliability.

- Please consult Chapter 5.0, Alternatives Analysis, for further discussion of these alternatives and other alternatives considered during development of this EIR.

2.8 AREAS OF CONTROVERSY

The potential areas of controversy surrounding the proposed project identified as part of the EIR scoping and Notice of Preparation (NOP) processes are evaluated in Chapter 4.0 of this EIR and are listed below. As part of the environmental review process, County decision-makers will need to weigh these issues and concerns in reaching a final decision on the project.

- Traffic operations
- Safety of pedestrians and bicyclists
- Air emissions associated with construction and car idling
- Traffic delays due to construction
- Potential loss of parking spaces
- Access to adjacent businesses, schools, and residential neighborhoods
- Transit operations
- Stormwater drainage

2.9 SUMMARY OF MAJOR CONCLUSIONS

The following is a summary of the major conclusions set forth in the environmental analysis:

- The EIR identifies a total of 25 project impacts as significant or potentially significant. As identified in Table 2.11.A, feasible mitigation is available to reduce all of these impacts to a less-than-significant level.
- Project construction may require nighttime lighting, which would introduce a new source of nighttime light and glare in the project area. This potential impact would be reduced to a less-than-significant level through mitigation, which would require that flood lighting be placed in a manner such that the light will be cast downward and confined to the immediate work area.
- Temporary, localized emissions of Particulate Matter$_{10}$ (PM_{10}) during construction have the potential to exceed ambient air quality standards and contribute to regional violations of the ambient air quality standards. This potential impact would be reduced to a less-than-significant level through mitigation.
- Project implementation could result in indirect impacts to federal and/or state listed animal species, including salmonid species – Central California Coastal coho salmon, Central California Coast steelhead, and California Coastal chinook salmon – western pond turtles, California red-

legged frogs, and California giant salamanders. Mitigation measures are recommended in Section 4.3 of the EIR to protect water quality in Wolfe Grade Creek and minimize loss of salmonid individuals and aquatic habitat. Measures include preparation and implementation of a Storm Water Pollution Protection Plan (SWPPP), preparation of an emergency response and clean-up plan, and environmental training for construction personnel. These mitigation measures would reduce potential impacts to salmonids and other aquatic species to less than significant.

- Project implementation could impact nesting special-status bird species, as well as common nesting bird species, located in the proposed project disturbance zone and adjacent areas. Mitigation measures are recommended in Section 4.3 of the EIR to avoid impacts to nesting birds. Measures include pre-construction surveys and establishment of buffer zones, if needed. These mitigation measures would reduce potential impacts to nesting birds to less than significant.

- Project implementation could impact roosting and maternity sites for pallid bats and other bat species, if present. In particular, impacts to coast redwood and other trees could result in the removal of roosting and maternity sites. Mitigation measures are recommended in Section 4.3 of the EIR to avoid impacts to bat species. Measures include preconstruction surveys, and development of CDFW-approved mitigation plan. These mitigation measures would reduce potential impacts to nesting birds to less than significant.

- Project construction may impact up to 2,000 square feet of riparian vegetation associated with Wolfe Grade Creek and would result in direct, permanent impact to approximately 45 square feet (0.001 acre) of a potentially jurisdictional roadside seasonal wetland ditch that would be filled and replaced with a concrete ditch or underground pipe as a result of road widening. Mitigation measures are recommended in Section 4.3 of the EIR to avoid and/or compensate for impacts to these features. Measures include installation of protective fencing around riparian vegetation, replacement of riparian plants at a 3:1 ratio, compliance with regulatory permit conditions, and replacement of the seasonal wetland at a 1:1 ratio. These mitigation measures would reduce potential impacts to nesting birds to less than significant

- Project implementation would result in the removal of 7 trees to accommodate proposed roadway improvements. Some of these trees may be protected under the Marin County Tree Protection Ordinance and/or the City of Larkspur Municipal Code. Mitigation measures are recommended in Section 4.3 of the EIR to minimize tree loss and provide replacement trees for those that are removed. Measures include replanting of native trees at a 3:1 replacement ratio. These mitigation measures would reduce the impact of tree loss to a less-than-significant level.

- Construction activities such as excavation and grading could affect cultural resources, including archaeological or paleontological resources, or human remains. Mitigation measures set forth in Section 4.4 would reduce potential impacts to less than significant.

- The proposed project could be subject to significant impacts related to strong seismic ground shaking, and/or seismically induced landslides. Mitigation measures identified in Section 4.5 would reduce potential impacts to a less-than-significant level.

- Heavy equipment used during project construction could generate significant greenhouse gas emissions. Mitigation identified in Section 4.6 would reduce potential impacts to a less-than-significant level.

- Road construction activities would include the use of hazardous materials such as fuels, oils, lubricants, asphalt products, other petroleum products, and solvents. In addition, pavement rehabilitation activities for the proposed project could include the removal of yellow traffic stripe and pavement markings that potentially contain LBP. Excavation and dewatering activities for the proposed project could encounter residual groundwater contamination, particularly during pipeline replacement activities, from four leaking underground storage tank sites located adjacent to the project site. Mitigation measures identified in Section 4.7 would reduce potential impacts to less than significant.

- Construction activities, including placement of road material, grading, asphalt grinding, and excavation, could result in discharge of sediment (and pollutants bound to sediment), asphalt materials, fuels, oils, paints, and solvents into Wolfe Grade Creek. Compliance with the NPDES Construction General Permit, which requires preparation and implementation of a SWPPP that includes BMPs to prevent the degradation of stormwater quality, is mandatory and would ensure that stormwater discharges during project construction would have a less-than-significant impact on water quality.

- Construction-period noise could be perceived as a nuisance to adjacent land uses, including single-family and multi-family residential uses. Mitigation identified in Section 4.10 would reduce potential impacts to a less-than-significant level.

- Project-related construction activities such as lane closures have the potential to reduce travel speed to unsatisfactory levels, increase roadway hazards and affect transit service during the construction period. Mitigation measures identified in Section 4.12, which require preparation of a Traffic Control Plan to address construction-related traffic, would reduce potential impacts to a less-than-significant level.

2.10 ISSUES TO BE RESOLVED

The primary issues to be resolved include the following:

- The Marin County Board of Supervisors will decide whether to adopt the project as proposed by the Marin County Department of Public Works, or one of the alternatives identified in this EIR, or some combination of elements from the project and the alternatives. Based on the alternatives analysis, the No Project Alternative is the environmentally superior alternative, but meets none of the project objectives. Both the proposed project and the Congestion Relief Alternative would result in similar environmental impacts; however, the Congestion Relief Alternative would not provide pedestrian and bicycle improvements to enhance safety for all

modes. In reaching its decision the Board of Supervisors will also consider the mitigation measures proposed in the EIR as these measures can be adopted as conditions of project approval.

2.11 SUMMARY TABLE OF IMPACTS AND MITIGATION MEASURES

Table 2.11.A identifies impacts and mitigation measures associated with the proposed project. The information in the table is organized to correspond with environmental issues discussed in Chapter 4.0. The table is arranged in four columns: (1) environmental impacts; (2) level of significance prior to mitigation measures; (3) mitigation measures; and (4) level of significance after mitigation. For a complete description of potential impacts and recommended mitigation measures, refer to Chapter 4.0, Setting, Impacts, and Mitigation Measures.

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
4.1 Aesthetics			
(1) Scenic Vista/Existing Viewshed	LTS	No mitigation is required.	
(2) Scenic Resources along a State Scenic Highway	LTS	No mitigation is required.	
(3) Existing Visual Character or Quality	LTS	No mitigation is required.	
(4) Reduction in Sunlight or Introduction of Shadows in Areas Used by the Public	LTS	No mitigation is required.	
(5) New Source of Light and Glare			
Impact VIS-1: Nighttime construction for the proposed project would create a new source of light affecting nighttime views for adjacent residences.	S	Mitigation Measure VIS-1: Contract specifications shall require that flood lighting be placed in a manner such that the light will be cast downward and confined to the immediate work area. In addition, lights will be shielded to prevent stray light. County staff may require photometric analysis if necessary to properly evaluate the proposed lighting.	LTS
(6) Conflict with County Goals and Policies			
4.2 Air Quality			
(1) Conflict with Current Air Quality Plans	LTS	No mitigation is required.	
(2) Violate Any Air Quality Standards **Impact AIR-1:** Construction of the proposed project would generate air pollutant emissions that could violate air quality standards.	S	Mitigation Measure AIR-1: The County of Marin and project contractor shall follow Basic Construction Mitigation Measures as recommended by the BAAQMD, including: • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • All visible mud or dirt tracked-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph.	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		• All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • A publicly visible sign shall be posted with the telephone number and person to contact at Marin County regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD phone number shall also be visible to ensure compliance with applicable regulations.	
(3) Operational Emissions	LTS	No mitigation is required.	
(4) Localized CO Impacts.	LTS	No mitigation is required.	
(5) Substantial Pollutant Concentrations	LTS	No mitigation is required.	
(6) Odors	LTS	No mitigation is required.	
4.3 Biological Resources			
(1) Special-status Species. **Impact BIO-1:** Implementation of the proposed project could impact special-status bird species protected under the MBTA potentially nesting in and adjacent to the project site.	S	Mitigation Measure BIO-1: If construction work is scheduled during the breeding season (February through August), a qualified wildlife biologist shall conduct a pre-construction survey on and within 250 feet of the project site to determine if nesting birds are present. Pre-construction surveys shall not be required for construction work occurring during the non-breeding season from September through February. The pre-construction survey shall	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		be conducted within 15 days prior to the start of work. If active nests are found in the work area, the biologist shall determine an appropriately sized buffer around the nest in which no work shall be allowed until the young have successfully fledged or the nest is inactive. The size of the nest buffer shall be determined by the biologist, and shall be based on the nesting species, the context of the nest site in relation to existing human activity and its sensitivity to disturbance, and the expected types of disturbance. No project construction activities shall be allowed to occur within this zone until a qualified biologist has determined that all juveniles have fledged from occupied nests or the nest is no longer active.	
Impact BIO-2: Implementation of the proposed project could impact federal and/or state listed salmonid species - Central California Coastal coho salmon, Central California Coast steelhead, and California Coastal chinook salmon.	S	Mitigation Measure BIO-2: A SWPPP, in accordance with the State Water Resources Control Board, National Pollutant Discharge Elimination System (NPDES) Construction General Permit, shall be prepared and implemented. The SWPPP shall include a wide range of Best Management Practices (BMPs) for controlling sediment and turbidity during construction. These BMP should include the following measures to avoid impacts to salmonids: No fill material, including asphalt or concrete, shall be allowed to enter the stream. Any concrete structures (such as culvert headwall construction) below the tops of banks shall be poured in tightly sealed forms and shall not be allowed contact with surface waters until the cement has fully cured. Poured concrete shall be excluded from the wetted channel for a period of 30 days after it is poured. During that time the poured concrete shall be kept moist, and runoff from the concrete shall not be allowed to enter the creek. Commercial sealants may be applied to the poured concrete surface where difficulty in excluding water flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is dry and fully cured according to the manufacturer's specifications. No substances toxic to aquatic life shall be discharged into Wolfe Grade Creek or the stormwater drainage system of SFDB. Hydroseed mixes used to stabilize disturbed areas shall not contain fertilizers.	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		Equipment maintenance and fueling areas shall be located at least 100 feet away from any creek bank. Fueling must be behind a containment barrier that shall prevent any spilled or leaked fuel from running into the creek. All equipment servicing must occur within designated areas. All motorized equipment used during construction or demolition activities shall be checked for oil, fuel, and coolant leaks prior to initiating work. Any equipment found to be leaking fluids shall not be used in or around aquatic habitat features in order to minimize the chances of contaminating the habitat and potentially impacting sensitive species, particularly salmon and steelhead. The project's contractor shall prepare an emergency response and clean-up plan prior to beginning work at the site. The plan shall detail the methods to be used to contain and clean-up spills of petroleum products or other hazardous materials in the work area. All maintenance crew personnel shall receive environmental training about the sensitive nature of the special-status species in the project vicinity. This training that shall include descriptions of the special-status species and all project measures in place to protect the species during construction. Crews shall also be informed to stop all work and notify their supervisor or the project biologist if special-status species are observed within the project site.	
Impact BIO-3: Implementation of the proposed project could impact special-status amphibian and reptile species potentially present within the project area.	S	Mitigation Measure BIO-3: Implement Mitigation Measure BIO-2, which requires preparation and implementation of a SWPPP that includes BMPs for controlling sediment and turbidity during construction.	LTS
Impact BIO-4: Implementation of the proposed project could impact special-status roosting bat species potentially present within the project area.	S	Mitigation Measure BIO-4a: All suitable roost trees to be removed within the project area shall be surveyed for the presence of bat roosts by a qualified biologist. Surveys may entail direct inspection of the trees or nocturnal surveys. The survey shall occur no more than two weeks prior to the initiation of vegetation removal and ground disturbing activities. If no roosting habitat is present, then the tree shall be removed within two weeks following the survey.	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		If active bat roosts are present, a qualified biologist shall determine the species of bats present and the type of roost (i.e., day roost, night roost, maternity roost). If the biologist determines that the roosting bats are not a special-status species and the roost is not being used as a maternity roost, then the bats may be evicted from the roost using methods developed by a biologist experienced in developing and implementing bat mitigation and exclusion plans.	
Impact BIO-4: *Continued.*	S	Mitigation Measure BIO-4b: If special-status bat species are found to be present or if the roost is determined to be a maternity roost for any species of bat, then a qualified biologist experienced in developing bat mitigation and exclusion plans shall develop a mitigation plan to compensate for the lost roost site. Removal of the roost shall only occur when the mitigation plan has been approved by CDFW and only when bats are not present in the roost. The mitigation plan shall detail the methods of excluding bats from the roost and the plans for a replacement roost in the vicinity of the project site. One replacement roost shall be provided for each roost impacted. The mitigation plan shall be submitted to CDFW for approval prior to implementation. The plan shall include: (1) a description of the species targeted for mitigation; (2) a description of the existing roost or roost sites; (3) methods to be used to exclude the bats if necessary; (4) methods to be used to secure the existing roost site to prevent its reuse prior to removal; (5) the location for a replacement roost structure; (6) design details for the construction of the replacement roost; (7) monitoring protocols for assessing replacement roost use; (8) a schedule for excluding bats, demolishing of the existing roost, and construction of the replacement roost; and (9) contingency measures to be implemented if the replacement roosts do not function as designed.	LTS
Impact BIO-4: *Continued.*	S	Mitigation Measure BIO-4c: Active bat roosts shall only be removed during seasons when bats are active and the young are able to fly (March 1 - April 15, and August 1 - October 15).	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Impact BIO-4: *Continued.*	S	Mitigation Measure BIO-4d: Removal of trees surrounding roost trees shall be conducted in a manner to prevent the tree being removed from falling on or otherwise damaging the roost tree.	LTS
Impact BIO-4: *Continued.*	S	Mitigation Measure BIO-4e: No diesel or gas-powered equipment shall be stored or operated directly beneath a roost site.	LTS
Impact BIO-4: *Continued.*	S	Mitigation Measure BIO-4f: Under supervision of a qualified biologist, roost trees shall be removed in two steps, over two successive days: Branches and limbs identified by the biologist should be removed on Day 1 (Disturbance). The remainder of the tree should be removed on Day 2 (Removal).	LTS
Impact BIO-4: *Continued.*	S	Mitigation Measure BIO-4g: All construction activity in the vicinity of an active roost shall be limited to daylight hours.	LTS
(2) Riparian Habitat. **Impact BIO-5:** Implementation of the proposed project would impact riparian habitat within the project area.	S	Mitigation Measure BIO-5a: Prior to construction, the County shall install protective fencing around and avoid excavating within the root zones of the willows and other riparian vegetation near the intersection of SFDB and McAllister Avenue. If impacts to the willows and riparian vegetation cannot be avoided, the County may need to obtain a Water Quality Certification permit from the RWQCB and/or a CDFW Streambed Alteration Agreement.	LTS
Impact BIO-5: *Continued.*	S	Mitigation Measure BIO-5b: If riparian plants, such as willows, are removed or impacted during construction, the impacted riparian plants shall be replaced at a minimum 3:1 ratio, which is the standard mitigation ratio normally required by CDFW under a Streambed Alteration Agreement). Replacement willows shall be planted at a suitable location along Wolfe Grade Creek near SFDB.	LTS
(3) Wetlands. **Impact BIO-6:** Implementation of the proposed project would impact seasonal wetlands and other waters present within the project area.	S	Mitigation Measure BIO-6a: Prior to construction, a formal wetland delineation shall be prepared to determine the extent of fill to jurisdictional areas, including wetlands. If the U.S. Army Corps of Engineers determines	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		that the seasonal wetland ditch is jurisdictional and the proposed project will impact the wetland ditch, Marin DPW shall obtain all required regulatory permits to conduct work activities within the ditch. Permits that may be required include a Section 401 Water Quality Certification from the RWQCB, a Section 404 permit from the Corps, and a Lake and Streambed Alteration Agreement from CDFW. The County shall comply with all permit conditions, including providing mitigation for fill of jurisdictional areas.	
Impact BIO-6: *Continued.*	S	Mitigation Measure BIO-6b: Prior to construction, Marin County shall provide mitigation for the loss of 45 square feet of seasonal wetlands associated with the filling of the potentially jurisdictional roadside wetland ditch by either establishing new seasonal wetland ditch at a minimum 1:1 on-site replacement ratio within the vicinity of the SFDB project, applying a native wetland seed mix to a new or existing ditch, or enhancing a creek channel in the vicinity of the project. The 1:1 on-site replacement ratio would provide for no-net-loss of wetlands.	LTS
Impact BIO-6: *Continued.*	S	Mitigation Measure BIO-6c: During construction, Marin County shall implement all water quality protection measures contained in the SWPPP to prevent the direct and indirect release of soil and other construction materials into wetlands and streams.	LTS
(4) Wildlife Movement Corridors.	LTS	No mitigation required.	
(5) Conflict with Local Plans or Policies. **Impact BIO-7:** Implementation of the proposed project would impact native trees protected by the Marin County Tree Preservation Ordinance present within the project area.	S	Mitigation Measure BIO-7: The project shall comply with the requirements of the Marin County Tree Protection Ordinance, the Town of Ross Municipal Code Section 12.24.080(d); (replacement tree requirements), and the Town of Larkspur ordinances 968, 906, 862, 877, and 772 (Tree Protections) for any tree loss under the proposed. Consistent with the ordinances, trees of the same species as those impacted shall be replanted at a 3:1 replacement ratio. The replacement trees shall be 15-gallon specimens unless a certified arborist determines otherwise. Planted trees shall be maintained with browse protection and weed cloth around the root zones as needed, and regularly watered during the dry season until such time that a certified	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		arborist has determined that they are sufficiently established to not require further maintenance or watering.	
(6) Conflict with Conservation Policies or Plans.	LTS	No mitigation required.	
4.4 Cultural Resources			
(1) Historical Resources **Impact CULT-1:** Project ground-disturbing activities could have a substantial adverse change on archaeological deposits that qualify as historical resources, as defined in CEQA Guidelines Section 15064.5, and could materially impair a pre-contact archaeological site	S	Mitigation Measure CULT-1a: All project ground disturbance within 500 feet of the Sir Francis Drake Boulevard / La Cuesta Drive intersection that is 18 inches below surface shall be monitored by an archaeologist. Monitoring shall continue at this location until the archaeologist determines that there is a low potential for subsurface archaeological deposits. The archaeological monitoring shall be overseen by an archaeologist that meets or exceeds the Secretary of the Interior's Professional Qualifications Standards in archaeology. Should an archaeological deposit be encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and the on-site archaeologist shall assess the deposit, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. The County shall be notified by the construction contractor within 24 hours of the encounter. If found to be significant by the on-site archaeologist (i.e., eligible for listing in the California Register of Historical Resources), the County shall be responsible for funding and overseeing implementation of appropriate mitigation measures. Mitigation measures may include, but would not be limited to, recording the archaeological deposit, data recovery and analysis, and public outreach. Upon completion of the selected mitigations, a report documenting methods, findings, and recommendations shall be prepared and submitted to the County for review, and the final report shall be submitted to the Northwest Information Center at Sonoma State University. Significant archaeological materials shall be submitted to an appropriate local curation facility and used for future research and public interpretive displays, as appropriate.	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Impact CULT-1: *Continued.*		Mitigation Measure CULT-1b: Should an archaeological deposit be encountered during project subsurface construction activities when an archaeological monitor is not on site, all ground-disturbing activities within 25 feet shall be redirected and a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology contacted to assess the situation, determine if the deposit qualifies as a historical resource, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. If the deposit is found to be significant (i.e., eligible for listing in the California Register of Historical Resources), the County shall be responsible for funding and implementing appropriate mitigation measures. Mitigation measures may include recordation of the archaeological deposit, data recovery and analysis, and public outreach regarding the scientific and cultural importance of the discovery. Upon completion of the selected mitigations, a report documenting methods, findings, and recommendations shall be prepared and submitted to the County for review, and the final report shall be submitted to the Northwest Information Center at Sonoma State University. Significant archaeological materials shall be submitted to an appropriate local curation facility and used for future research and public interpretive displays, as appropriate. The County shall inform its contractor(s) of the sensitivity of the project corridor for archaeological cultural resources and shall verify that the following directive has been included in the appropriate contract documents: *"The subsurface of the construction site may be sensitive for Native American archaeological deposits and associated human remains. If archaeological deposits are encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and a qualified archaeologist contacted to assess the situation, determine if the deposit qualifies as a historical resource, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. Project personnel*	

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		shall not collect or move any archaeological materials. Archaeological deposits can include shellfish remains; bones; flakes of, and tools made from, obsidian, chert, and basalt; and mortars and pestles. Contractor acknowledges and understands that excavation or removal of archaeological material is prohibited by law and constitutes a misdemeanor under California Public Resources Code, Section 5097.5."	
(2) Archaeological Resources **Impact CULT-2:** Project ground-disturbing activities could cause a substantial adverse change in the significance of an archaeological resource, as defined in CEQA Guidelines Section 15064.5, and could materially impair a pre-contact archaeological site.	S	Mitigation Measure CULT-2: Implement Mitigation Measures CULT-1a and CULT-1b, which require on-site monitoring of ground disturbances within 500 feet of the Sir Francis Drake Boulevard / La Cuesta Drive intersection and work stoppage in the event of an archaeological discovery.	LTS
(3) Paleontological Resources **Impact CULT-3:** Project ground-disturbing activities could directly or indirectly destroy a unique paleontological resource or site by unearthing or otherwise displacing fossils in Franciscan Complex bedrock that underlie the project corridor.	S	Mitigation Measure CULT-3: Should paleontological resources be encountered during project subsurface construction activities, all ground-disturbing activities within 25 feet shall be redirected and a qualified paleontologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. For purposes of this mitigation, a "qualified paleontologist" shall be an individual with the following qualifications: 1) a graduate degree in paleontology or geology and/or a person with a demonstrated publication record in peer-reviewed paleontological journals; 2) at least two years of professional experience related to paleontology; 3) proficiency in recognizing fossils in the field and determining their significance; 4) expertise in local geology, stratigraphy, and biostratigraphy; and 5) experience collecting vertebrate fossils in the field. If the paleontological resources are found to be significant and project activities cannot avoid them, measures shall be implemented to ensure that the project does not cause a substantial adverse change in the significance of the paleontological resource. Measures may include monitoring, recording the fossil locality, data recovery and	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		analysis, a final report, and accessioning the fossil material and technical report to a paleontological repository. Upon completion of the assessment, a report documenting methods, findings, and recommendations shall be prepared and submitted to the County for review. If paleontological materials are recovered, this report also shall be submitted to a paleontological repository such as the University of California Museum of Paleontology, along with significant paleontological materials. Public educational outreach may also be appropriate. The County shall inform its contractor(s) of the sensitivity of the project site for paleontological resources and shall verify that the following directive has been included in the appropriate contract documents: *"The subsurface of the construction site may be sensitive for fossils. If fossils are encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and a qualified paleontologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. Project personnel shall not collect or move any paleontological materials. Fossils can include plants and animals, and such trace fossil evidence of past life as tracks or plant imprints. Ancient marine sediments may contain invertebrate fossils such as snails, clam and oyster shells, sponges, and protozoa; and vertebrate fossils such as fish, whale, and sea lion bones. Contractor acknowledges and understands that excavation or removal of paleontological material is prohibited by law and constitutes a misdemeanor under California Public Resources Code, Section 5097.5."*	
(4) Human Remains **Impact CULT-4:** Project ground-disturbing activities have the potential to unearth Native American human remains.	S	Mitigation Measure CULT-4: If human remains are identified during construction and cannot be preserved in place, the County shall fund 1) the removal and documentation of the human remains from the project corridor by a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology, 2) the scientific analysis and of the remains by a qualified archaeologist, should such analysis	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		be permitted by the Native American Most Likely Descendant, and 3) the reburial of the remains, as appropriate. All excavation, analysis, and reburial of Native American human remains shall be done in consultation with the Native American Most Likely Descendant, as identified by the California Native American Heritage Commission.	
4.5 Geology and Soils			
(1) Located within an Alquist-Priolo Earthquake Fault Zone.	LTS	No mitigation required.	
(2) Seismic Shaking **Impact GEO-1:** Strong ground shaking at the project site could result in risks to humans and damage to property.	S	Mitigation Measure GEO-1: All grading plans, cut and fill slopes, compaction procedures, and retaining structures shall be designed by a licensed professional engineer and inspected during construction by a licensed professional engineer (or representative) or Certified Engineering Geologist (or representative). All designs shall be submitted to, and approved by, the Marin County Department of Public Works prior to implementation.	LTS
(3) Slope Instability/Landslide	LTS	No mitigation required.	
(4) Erosion and Sedimentation	LTS	No mitigation required.	
(5) Soil Collapse	LTS	No mitigation required.	
(6) Expansive Soils	LTS	No mitigation required.	
(7) Soils Capable of Adequately Supporting an Alternative Waste Water Disposal System	LTS	No mitigation required.	
(8) Mineral Resources	LTS	No mitigation required.	
(9) Unique Geologic Features	LTS	No mitigation required.	
4.6 Global Climate Change			
(1) Construction Emissions **Impact GHG-1:** Construction activities associated with the proposed project would produce substantial greenhouse gas emissions.	S	Mitigation Measure GHG-1a: Implement Mitigation Measure AIR-1, which requires implementation of BAAQMD's Basic Construction Mitigation Measures to reduce diesel PM exhaust emissions as well as construction dust (PM_{10} and $PM_{2.5}$), which contribute to greenhouse gas emissions.	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
Impact GHG-1: *Continued.*	S	Mitigation Measure GHG-1b: The County of Marin and project contractor shall ensure the following measures are implemented through all construction contracts and specifications for the project: • The idling time of diesel powered construction equipment shall be minimized to 2 minutes. • Low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings) shall be used. • All construction equipment, diesel trucks, and generators shall be equipped with Best Available Control Technology for emission reductions of NO_x and PM. • All contractors shall use equipment that meets the ARB's most recent certification standard for off-road heavy-duty diesel engines. • The project contractor shall use construction equipment that utilizes cleaner fuel and equipment.	LTS
(2) Operational Emissions	LTS	No mitigation required.	
(3) Consistency with Plans	LTS	No mitigation required.	
4.7 Hazards and Hazardous Materials			
(1) Routine Management of Hazardous Materials	LTS	No mitigation required.	
(2) Accidental Hazardous Materials Releases	LTS	No mitigation required.	
(3) Emission or Handling of Hazardous Materials within 0.25 mile of a School	LTS	No mitigation required.	
(4) Included on a List of Hazardous Materials Sites	LTS	No mitigation required.	
(5) Aviation Hazards	LTS	No mitigation required.	
(6) Emergency Response or Evacuation Plan	LTS	No mitigation required.	
(7) Wildland Fire Hazards	LTS	No mitigation required.	

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
(8) Contamination from Adjacent Hazardous Materials Release Sites			
Impact HAZ-1: Project construction activities could encounter lead-based paint and residual groundwater contamination from adjacent hazardous materials release sites	S	Mitigation Measure HAZ-1: Construction at the proposed project site shall be conducted under a project-specific Construction Risk Management Plan (CRMP) to protect construction workers, the general public, and the environment from hazardous materials that could be disturbed during roadway rehabilitation and trench dewatering activities. The CRMP shall include specific construction worker health and safety requirements and procedures for managing hazardous materials in accordance with applicable laws, regulations, and permit requirements. The CRMP shall also include contingency measures in case unknown contamination is encountered during construction. The CRMP shall specifically include the following: • Procedures for testing and managing lead-based paint in yellow paint striping and markings that will be disturbed on existing roadways (if any); • Procedures for storing extracted groundwater, if any, adjacent to former leaking underground storage tank sites in Baker tank(s) until chemically characterized to determine the appropriate treatment requirements (if necessary) for discharge or disposal; • Procedures for identifying, testing, and managing soil and groundwater suspected of containing hazardous materials (if any) that have not previously been identified at the site; and • Identification of personnel responsible for implementation of the CRMP.	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
4.8 Hydrology and Water Quality			
(1) Water Quality Standards or Waste Discharge Requirements. **Impact HYD-1:** Project construction activities could generate non-stormwater discharges of contaminated dewatering effluent	S	Mitigation Measure HYD-1: Implement Mitigation Measure HAZ-1, which requires preparation and implementation of a Construction Risk Management Plan (CRMP).	LTS
(2) Groundwater Supplies and Recharge	LTS	No mitigation required.	
(3) Erosion or Siltation.	LTS	No mitigation required.	
(4) Flooding	LTS	No mitigation required.	
(5) Stormwater Runoff	LTS	No mitigation required.	
(6) Other Water Quality Concerns	LTS	No mitigation required.	
(7) Housing within a 100-Year Flood Hazard Area	LTS	No mitigation required.	
(8) Flows within a 100-Year Flood Hazard Area	LTS	No mitigation required.	
(9) Dam and Levee Failure.	LTS	No mitigation required.	
(10) Seiche, Tsunami, Mud Flow, and Sea Level Rise	LTS	No mitigation required.	
4.8 Land Use and Planning Policy			
(1) Divide an Established Community	LTS	No mitigation required.	
(2) Conflict with Applicable Plans, Policies and Regulations	LTS	No mitigation required.	
(3) Conflict with a Habitat Conservation Plan or Natural Community Conservation Plan	LTS	No mitigation required.	
(4) Convert Agricultural Land	LTS	No mitigation required.	
(5) Conflict with Surrounding Land Uses	LTS	No mitigation required.	
(6) Convert Open Space	LTS	No mitigation required.	
(7) Conflict with Local Zoning	LTS	No mitigation required.	
(8) Create Nuisance Impacts	LTS	No mitigation required.	

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
4.10 Noise			
(1) Temporary or Periodic Increase in Ambient Noise Levels **<u>Impact NOI-1</u>:** Construction period activities could create significant short-term noise impacts on noise sensitive properties adjacent to the project.	S	<u>Mitigation Measure NOI-1:</u> The project contractor shall implement the following measures during construction of the project: Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards. • Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site. • Locate equipment staging in areas that would create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction. • Ensure that all general construction related activities are restricted to 7:00 a.m. and 6:00 p.m. on weekdays, and between 9:00 a.m. and 5:00 p.m. on Saturdays. No construction shall be permitted on Sundays or holidays. To conduct work outside of these hours, the project sponsor shall obtain written permission from the Marin County Community Development Director or City of Larkspur Public Works Director demonstrating sufficient cause. • Temporary noise control blanket barriers shall be installed in a manner to shield adjacent land uses. • Designate a "disturbance coordinator" at Marin County who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem.	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
(2) Substantial Permanent Increase in Ambient Noise Levels	LTS	No mitigation required.	
(3) Generate Excessive Groundborne Vibration	LTS	No mitigation required.	
(4) Excessive Airport Noise	LTS	No mitigation required.	
4.11 Public Services and Recreation			
(1) Fire Protection Services **Impact PSR-1:** Construction of the proposed project could impact fire protection services by increasing emergency response time.	S	Mitigation Measure PSR-1: During the design phase, Marin County's Resident Engineer shall require the contractor to coordinate all lane restrictions, roadway closures, and detour plans with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response times. Such coordination shall include the identification of alternative routes for emergency vehicles and routes across the construction area. The Traffic Control Plan shall specify that trained and equipped traffic management personnel (flaggers) will stop or divert routine traffic in order to accommodate the passing of Code 3 (lights and sirens) vehicles during construction. In addition, the fire departments/districts shall be notified for any change in traffic access during construction.	LTS
(2) Police Protection Services **Impact PSR-2:** Construction of the proposed project could impact police protection services by increasing emergency response time.	S	Mitigation Measure PSR-2: Implement Mitigation Measures PSR-1 and TR-1, which require preparation and implementation of a Traffic Control Plan and coordination with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response times.	LTS
(3) Schools	LTS	No mitigation required.	
(4) Parks and Recreation	LTS	No mitigation required.	

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
4.12 Traffic and Circulation			
(1) Conflict with Established Measures of Effectiveness			
Impact TR-1: Project-related construction activities could reduce travel speed and conflict with measures of effectiveness.	S	Mitigation Measure TR-1: Prior to construction, the project contractor shall submit a Traffic Control Plan (TCP) to Marin County DPW for review and approval. During construction activities, the Marin County DPW and the project contractors working on the project shall adhere to all requirements of the TCP. Implementation of a TCP would maintain peak period travel times to the extent possible during construction. The TCP shall include the following: • The route selection for movement of heavy equipment in the project vicinity shall be coordinated with the Marin County DPW, Marin County Sheriff's Department, and Police Department for applicable cities and unincorporated communities (City of Larkspur and Town of Ross) to minimize traffic and physical road impacts. Truck drivers shall be notified of and required to use the most direct route between the project site and Highway 101. • Heavy equipment transport, material transportation, or exportation to and from the project site shall not occur during weekday commute peak traffic periods and shall be coordinated by the contractor with the Marin County DPW, Marin County Sheriff's Department, and relevant city/town police departments. • The TCP will define the use of flaggers, warning signs, lights, barricades, and cones, etc., according to standard guidelines required by the County, City of Larkspur, and Town of Ross as appropriate. Further, the contractor will maintain the work site, including traffic control, in a safe condition at all times, even outside of normal work hours. In addition, the TCP shall prohibit lane closure within any intersections along the corridor during the a.m. and p.m. peak periods (i.e., from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m.). Prior to the start of these	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		peak periods, the contractor shall cover any open trenches and remove all construction equipment such that all lanes within the intersection are available for vehicular traffic during the peak periods. • Paving activities, which are the most intrusive, will occur between the hours of 6:00 p.m. and 6:00 a.m. • Construction activities completed within public street rights-of-way would require the use of a traffic control service, and any lane closures or traffic control measures would be consistent with those published in the *California Joint Utility Traffic Control Manual* (California Inter-Utility Coordinating Committee 2010). Implementing measures contained within the *California Joint Utility Traffic Control Manual* would facilitate safe passage of both construction vehicles and private vehicles. • Debris and mud on SFDB caused by trucks shall be monitored daily, and a roadway cleaning program shall be instituted as necessary.	
(2) Exceed Roadway LOS Standard **Impact TR-2:** Project-related construction activities could conflict with level of service standards due to travel speed reductions.	S	Mitigation Measure TR-2: Implement Mitigation Measure TR-1, which requires preparation and implementation of a TCP to maintain peak hour travel speeds to the extent possible during construction	LTS
(3) Result in a Change in Air Traffic Patterns	LTS	No mitigation required.	
(4) Substantially Increase Hazards **Impact TR-3:** Project construction activities could increase roadway hazards during the construction period due to the temporary closure of a travel lane, the presence of construction vehicles, and pavement damage created by construction traffic.	S	Mitigation Measure TR-3: Implement Mitigation Measure TR-1, which requires preparation and implementation of a TCP.	LTS
(5) Result in Inadequate Emergency Access **Impact TR-4:** Construction of the project could result in inadequate emergency access.	S	Mitigation Measure TR-4: A schedule of construction activities and the Traffic Control Plan (TCP) prepared per Mitigation Measure TR-1 shall be	LTS

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		provided to any pertinent local emergency service providers, including the Marin County Fire Department, Marin County Sheriff's Department, City of Larkspur Police and Fire Departments, Town of Ross Police Department, Ross Valley Fire Department, and paramedics.	
(6) Performance of Transit, Bicycle, or Pedestrian Facilities **Impact TR-5:** Construction of the project could affect transit service through the project area during the construction period.	S	Mitigation Measure TR-5: Prior to the start of the construction activities, MCTD and Golden Gate Transit Services shall be provided with detailed information regarding construction delays to plan a route deviation and/or notify passengers. Additionally, Mitigation Measure TR-1 would limit travel delays by restricting lane closures to off-peak periods.	LTS
(7) Intersection LOS	LTS	No mitigation required.	
(8) Parking and Internal Circulation	LTS	No mitigation required.	
(9) Pedestrian and Bicycle Circulation	LTS	No mitigation required.	
4.13 Utilities and Service Systems			
(1) Water	LTS	No mitigation required.	
(2) Wastewater	LTS	No mitigation required.	
(3) Solid Waste	LTS	No mitigation required.	
(4) Telecommunications	LTS	No mitigation required.	
(5) Energy (Electricity and Natural Gas)	LTS	No mitigation required.	
(6) Conflict with Conservation Policies or Plans.	LTS	No mitigation required.	

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3.0 PROJECT DESCRIPTION

This chapter describes the proposed Sir Francis Drake Boulevard Rehabilitation Project (proposed project) that is evaluated in this Environmental Impact Report (EIR). A description of the project background, objectives, location, and site characteristics is provided in this chapter followed by details of the project and a summary of required approvals and entitlements.

3.1 PROJECT BACKGROUND

Sir Francis Drake Boulevard (SFDB) is an east-west arterial roadway located in Marin County that commences just west of the Richmond-San Rafael Bridge and ends at the Point Reyes Lighthouse. The section of SFDB under study is a 2-mile segment located west of Highway 101 in the City of Larkspur extending to Ross Terrace ~~in~~at the Town of Ross town limits (Figure 3.1). SFDB serves not only the daily commute needs of upper Ross Valley and West Marin residents traveling to and from Highway 101, but also serves the communities of Greenbrae, Kentfield, and Larkspur. As shown on Figure 3.2, many uses exist along the corridor that serve both the region and local community including Bon Air Shopping Center, Bacich Elementary School, Kent Middle School, Marin Catholic High School, College of Marin, and Marin General Hospital.

As the corridor's pavement is nearing the end of its design life, the Marin County Public Works Department seeks to rehabilitate the asphalt as well as reduce vehicle congestion and improve access for pedestrians, bicyclists, and transit users. The County commenced an extensive outreach process in 2015 to define the community's goals for improvements to SFDB.

In discussions with public utilities operating facilities along SFDB, the County learned that the MMWD operates a transmission pipeline located within the pavement section of SFDB. The pipeline, often referred to as the "Sugar Line," was installed in 1920 and today conveys treated water from Ross Reservoir to customers in Greenbrae, Larkspur, and Corte Madera. The existing cast iron pipe is reaching the end of its useful life and has experienced numerous breaks in recent years. As a result, the County on behalf of MMWD is proposing to replace approximately 8,000 feet of existing potable water pipeline as part of the proposed project.

Funding to study and implement improvements to SFDB originates through the Transportation Authority of Marin's Measure A program under Strategy 3 for major roads and related infrastructure. At this time, sufficient funds are not available to construct all of the project elements. In the initial phase, the County would complete the improvements associated with pavement rehabilitation, congestion relief, and pedestrian safety. The County intends to add additional elements as funds become available. Funding for the water line replacement will be provided by MMWD.

3.2 PROJECT OBJECTIVES

An outreach process integrating community members, local agencies, and utility companies commencing in 2015 included four community meeting workshops, two walking tours, and several meetings with focus groups. Through the outreach process, participants established the following objectives for the project that provide multiple public benefits, including:

LSA

FIGURE 3.1

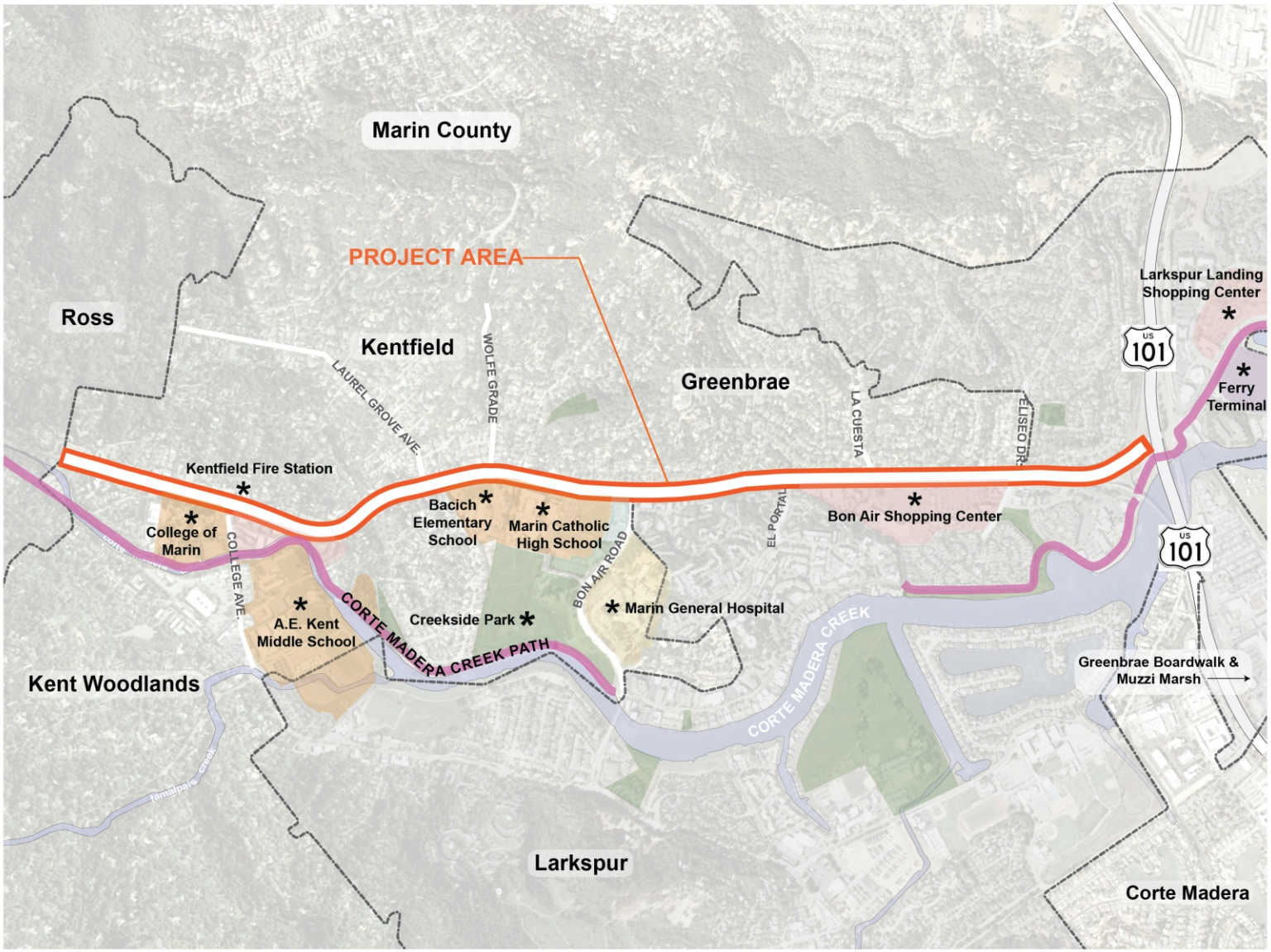
FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Regional Location

P:\BKF1501\g\EIR\Figure 3.1_Regional Location.cdr (5/8/2017)



LSA

FIGURE 3.2

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Project Location

P:\BKF1501\g\EIR\Figure 3.2_Project Location.cdr (5/8/2017)

- Repair pavement for a 20-year design life.
- Improve traffic flow and reduce congestion by reducing travel time along the SFDB corridor during the peak period and providing a third eastbound travel lane between El Portal Drive and Highway 101.
- Close sidewalk gaps and improve pedestrian crossing safety at signalized and certain un-signalized intersections.
- Improve transit access by modifying bus stop layouts, providing safer crossings to access transit stops, and relocating the transit stop at College of Marin.
- Improve bicycle access and safety by improving the north-south connections at intersections, improving pavement conditions, and refreshing striping.
- Construct an economically viable project: provide roadway-related improvements balanced with available and reasonably foreseeable funding.
- Implement a comprehensive approach to providing improvements, including utility improvements, along the entire project corridor.

During the outreach process, MMWD identified the need to upgrade pipelines within the project area. To minimize inconvenience to the public related to the construction of two separate projects along SFDB, the County plans to integrate the MMWD pipeline into the project.

3.3 SITE DESCRIPTION

The following section describes the location of the project site, surrounding land uses, and site characteristics.

3.3.1 Location

The project site is located in central Marin County between the Cities of San Rafael and Larkspur. Sir Francis Drake Boulevard links the neighborhoods of Ross, Greenbrae, and Kentfield (see Figures 3.1 and 3.2). SFDB is also one of several routes used to access West Marin, San Anselmo, Fairfax, and Highway 1 from Highway 101. The project alignment is located in an unincorporated area of Marin County.

3.3.2 Surrounding Land Uses

Properties adjacent to the project site are predominantly single-family residential homes. Commercial uses are located on the south side of SFDB between Eliseo Drive and El Portal Drive, at the Bon Air Road intersection, and between West McAllister Avenue and Ross Terrace and on the north side of SFDB at Wolfe Grade. Multifamily housing exists near the intersection of College Avenue. As described above, key facilities located along the corridor include Bon Air Shopping Center, Bacich Elementary School, Kent Middle School, Marin Catholic High School, College of Marin, and Marin General Hospital.

3.3.3 Site Characteristics

The roadway varies in elevation but has a shallow slope of less than five percent in most areas within the project area. The project area comprises approximately two linear miles of SFDB, bounded on both sides by residential, commercial, and other urban development.

Land Cover Types. The prevailing land cover types are developed, ornamental landscaping, and ruderal vegetation. Additionally, native and non-native street trees, tidal marsh, freshwater/brackish marsh, riparian, and open water occur adjacent to or in the vicinity of SFDB.

Water Resources. SFDB is located within the Ross Valley Watershed with its principal tributary, the Corte Madera Creek, located to the south. SFDB crosses Wolfe Grade Creek near the intersection of McAllister Avenue in Kentfield, directly adjacent to the Bacich Elementary School. The creek is confined to an underground culvert north of SFDB and daylights immediately to the south of the road shoulder. Between Laurel Grove Avenue and Wolfe Grade, four existing box culverts, ranging in size from 54 inches by 36 inches to 10 feet by 4 feet, run parallel to and across SFDB. These culverts flow into a roadside creek along McAllister Avenue to the south before discharging into the Corte Madera Creek at Creekside Park. According to Marin County Geographical Information Systems (GIS) data[2], Wolfe Grade Creek and McAllister Creek merge underneath SFDB. Wolfe Grade Creek is connected to tidal marsh habitat approximately 0.2 mile downstream from SFDB.

Based upon a review of data from the Federal Emergency Management Administration, no portion of SFDB is subject to flooding due to a storm event with a 1 percent recurrence interval or the 100 year event.

Geology and Subsurface Soils. A geotechnical report was completed to review the subsurface conditions along the corridor by Miller Pacific dated June 16, 2017. In this report the regional geology shows the western portion of the street underlain by alluvial, colluvial, sandstone, and bedrock. The eastern portion shows artificial fill over Bay Mud and bedrock. During the field investigation, groundwater was not encountered in the upper 5 feet of the borings.

Contaminated Properties. The California State Water Resources Control Board's GeoTracker application identifies four sites along Sir Francis Drake Boulevard that have remediated leaking underground storage tanks. These include:

- 295 Sir Francis Drake Boulevard – Shell Gasoline Station
- 301 Sir Francis Drake Boulevard – Chevron Gas Station
- 501 Sir Francis Drake Boulevard – Tosco Facility
- College of Marin – former gasoline station

Public Utilities. In addition to the storm drain owned by Marin County, the following public utilities possess infrastructure within the public rights-of-way:

[2] Marin County. 2004. Community Development Agency. Stream Geographical Information Systems Layer.

- Domestic Water – Marin Municipal Water District
- Electricity and Gas – Pacific Gas and Electric
- Video/Data/Telephone – Comcast
- Video/Data/Telephone – AT&T
- Sanitary Sewer – Ross Valley Sanitary District

Storm Water. As described above, storm water runoff from SFDB is collected in curbside inlets that route flow in pipelines to discharge into Corte Madera Creek.

3.4 EXISTING ROADWAY CONDITIONS

The following section describes the existing conditions along the project corridor, including the roadway configuration, pavement condition, traffic conditions, and safety.

3.4.1 Existing Configuration

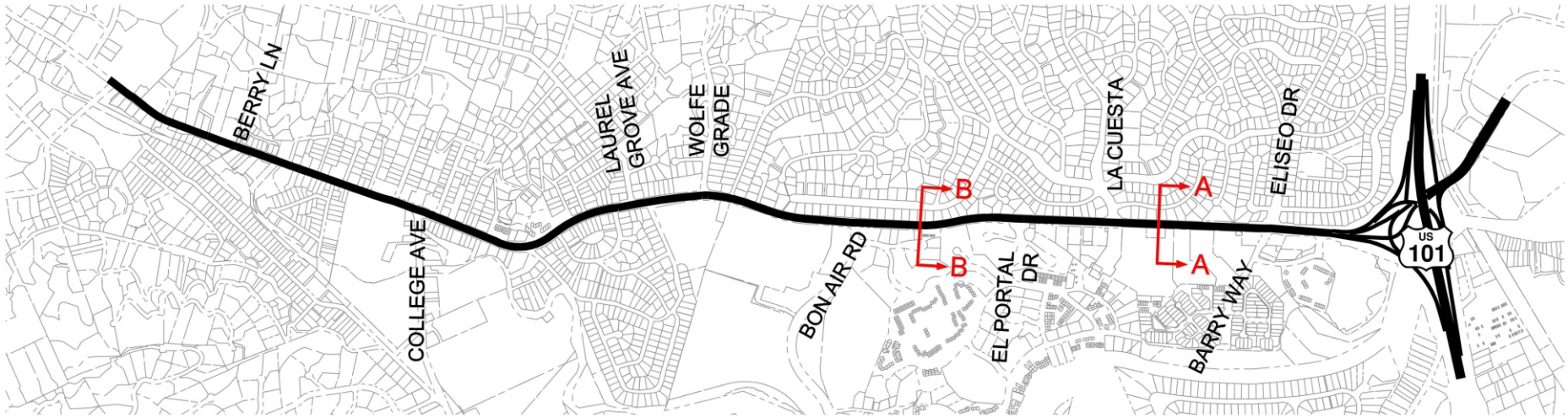
SFDB from Highway 101 to the Town of Ross has three distinct segments. The western segment near Ross has the lowest traffic volumes and generally includes the narrowest roadway cross-section, with three vehicle lanes, sidewalks on both sides, and is fronted by multifamily housing and the College of Marin. The middle segment, from College Avenue to El Portal Drive, is four lanes with left turn pockets, sidewalks on both sides, and includes on-street parking west of Wolfe Grade. Small businesses, multifamily housing, and the College of Marin front this segment, and it is also home to two schools, Bacich Elementary School and Marin Catholic High School, and includes a very constrained section of right-of-way due to steep topography between Bon Air Road and El Portal Drive that includes retaining walls and no median. East of Wolfe Grade, single-family residences back up to the north side of the roadway.

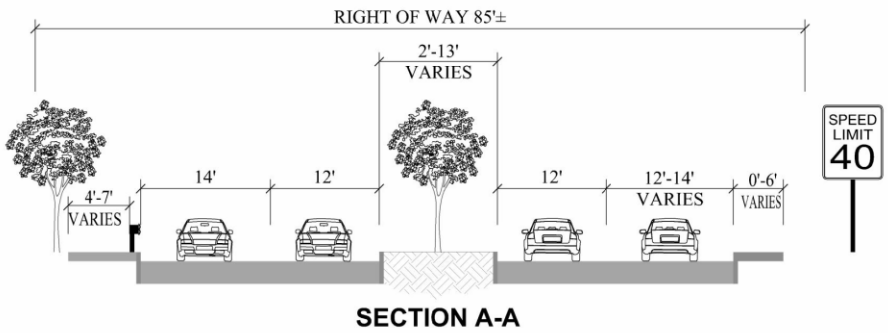
Children waiting to cross at the Laurel Grove intersection.

Existing intersection at Wolfe Grade

The east section, near the Bon Air Shopping Center, has the highest motor vehicle traffic volume, but sidewalks are not continuous on either side of SFDB.

The portion of SFDB within the project limits has a right-of-way varying from 100 feet in width between Wolfe Grade and College Avenue to only 60 feet near the westerly limit. In general, two travel lanes are provided in each direction with a left turn lane at intersections from the easterly limit to College Avenue. West of College Avenue, one travel lane with a center left turn lane is provided in each direction. Figures 3.3 and 3.4 illustrate travel lane configuration and width along the corridor. On-street parallel parking exists from College Avenue to Wolfe Grade as shown in Figure 3.5.





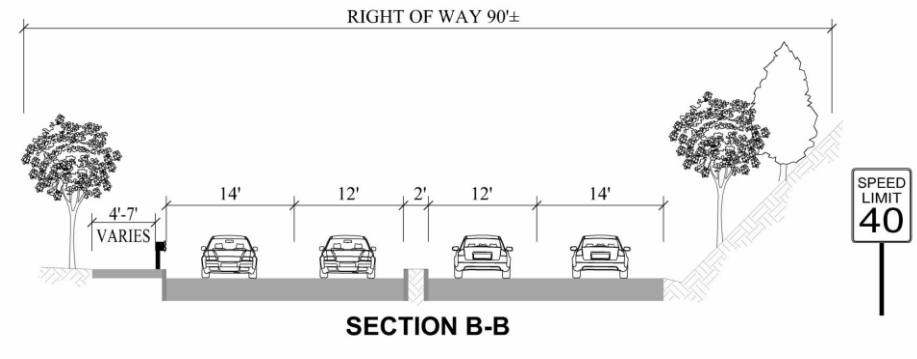


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FIGURE 3.3

N

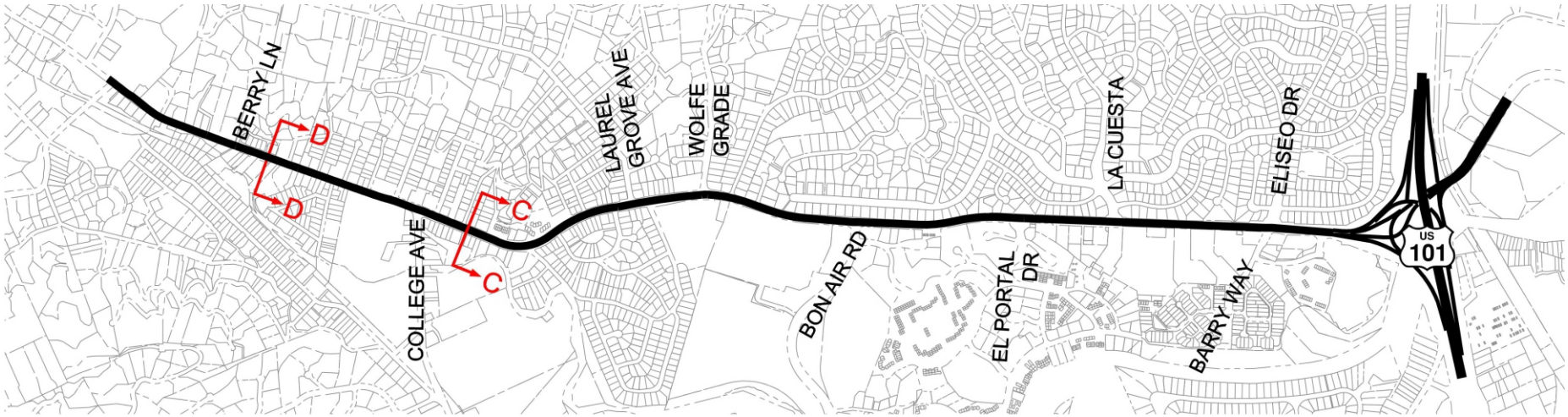
FIGURE NOT TO SCALE

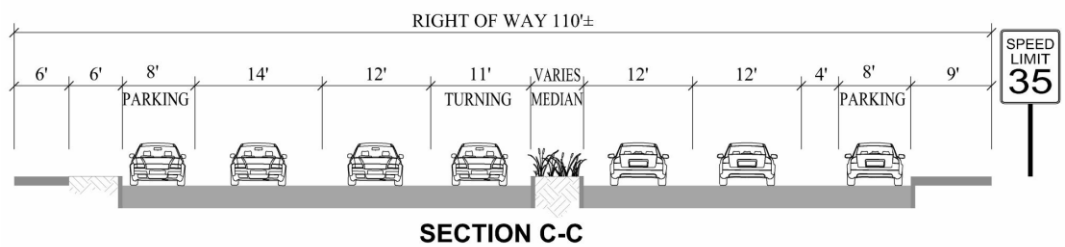
SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Typical Roadway Configuration

P:\BKF1501\g\EIR\Figure 3.3_Roadway Configuration.cdr (5/8/2017)





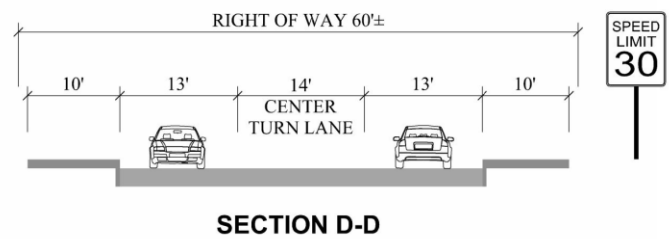


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FIGURE 3.4

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Typical Roadway Configuration

P:\BKF1501\g\EIR\Figure 3.4_Roadway Configuration.cdr (5/8/2017)

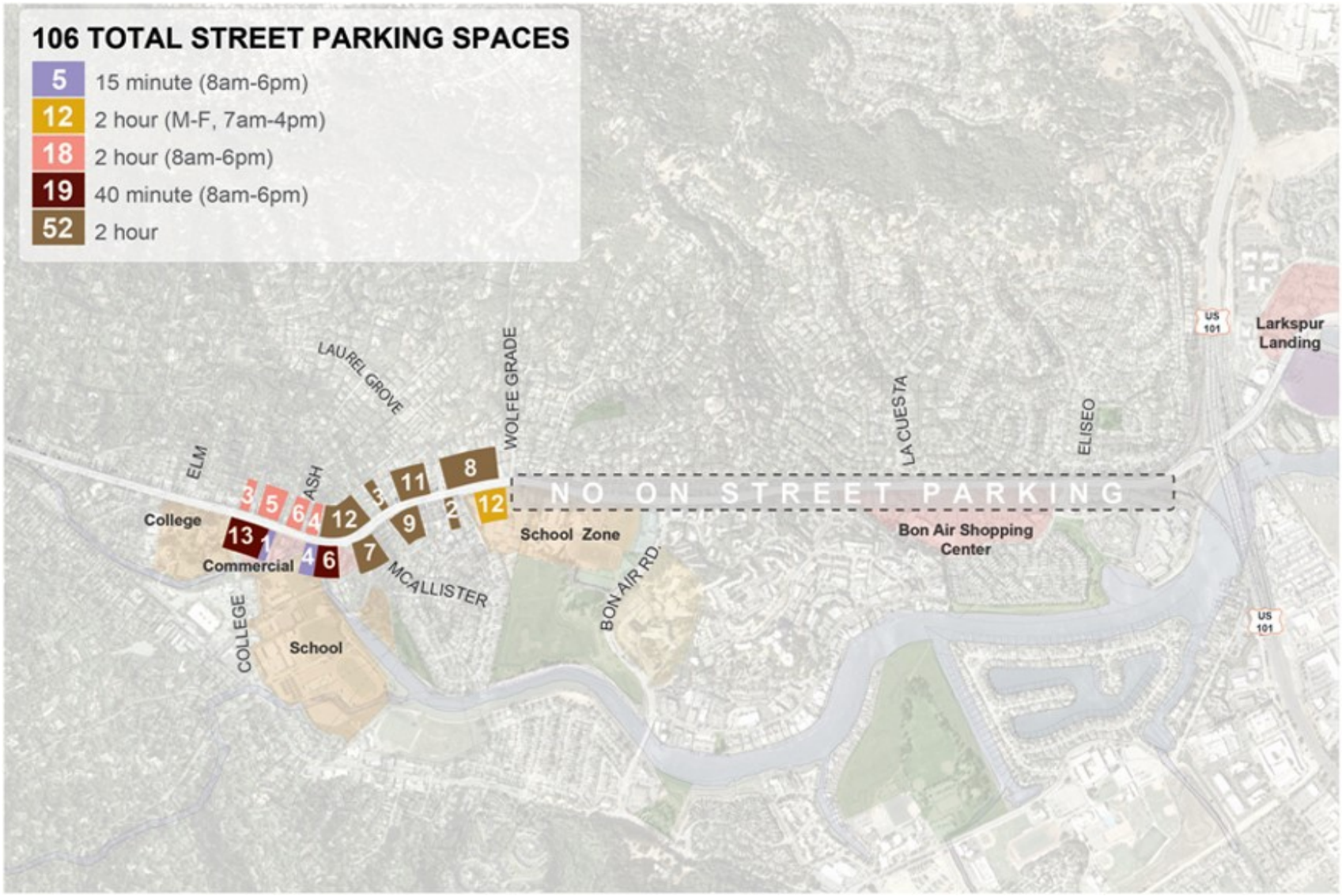

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FIGURE 3.5

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

On-Street Parking

P:\BKF1501\g\EIR\Figure 3.5_On-Street Parking.cdr (5/8/2017)

Sidewalks exist on the north side of SFDB from Eliseo Drive to Ross Terrace. On the south side, there are notable gaps in sidewalk between Bon Air Road and El Portal Drive as well as along the Bon Air Shopping Center frontage. The sidewalk fronting Marin Catholic High School is extremely narrow. An important connection between neighborhoods located to the north of SFDB and schools to the south is the Rosey Path, which provides a pedestrian linkage between the SFDB sidewalk east of Manor Road and Almenar Drive. Pedestrian crossings of SFDB are provided at signalized intersections except at Ash Avenue and Toussin Avenue, which have marked crosswalks and are uncontrolled, and at a pedestrian overcrossing immediately east of Wolfe Grade.

According to the 2008 Marin County Unincorporated Area Bicycle and Pedestrian Plan, SFDB is categorized as a Proposed Class 2 bicycle route.[3] Pedestrian and bicycle facilities are illustrated on Figure 3.6.

3.4.2 Existing Roadway Pavement Condition

SFDB is constructed of asphalt concrete pavement that varies in thickness from 6 to 18 inches. The County completed a survey in October 2016 of pavement distress along SFDB consistent with the Metropolitan Transportation Commission's guidelines.[4] The distress survey found rutting, delamination, and potholing, as well as alligator and block cracking.

Using the data collected, the County completed a Pavement Condition Index (PCI) analysis for SFDB. The PCI is a composite index from 0 being the worst to 100 being the best condition and reflects the extent and severity of pavement distress. The SFDB pavement condition currently has a PCI of between 65 and 68 or a fair rating, east of College Avenue to Highway 101. For the section of SFDB west of College Avenue the PCI is 47 or a poor rating. Figure 3.7 summarizes pavement condition along SFDB.

As the pavement condition decreases to a fair rating, the roadway's rate of deterioration begins to accelerate with a corresponding increase in the cost of repair. Thus, applying rehabilitation treatments, such as slurry, chip, or fog seals, as pavement reaches the fair condition is economically prudent.

3.4.3 Existing Traffic

Vehicle Volume and Distribution. Based upon recent traffic data, the average volume of daily traffic on SFDB is between 22,500 and 46,000 vehicles per day, with the heaviest volume along the eastern half of the SFDB corridor approaching Highway 101; over 90 percent of these vehicles are passenger vehicles. While most roadways in urban areas typically display peak traffic during the morning and

[3] A Class 1 Bikeway (bike path) provides a completely separated right-of-way for the exclusive use of bicycles and pedestrians. A Class 2 Bikeway (bike lane) provides a striped lane for one-way bike travel on a street or highway. A Class 3 Bikeway (bike route) is a signed shared roadway that provides shared use with pedestrians or motor vehicle traffic, typically on lower volume roadways.

[4] The County hires certified consultants who update the Pavement Condition Index (PCI) based on the Metropolitan Transportation Commission (MTC) guidelines. These PCIs are managed through the Street Saver program. More information on this program can be found on the MTC website at: http://mtc.ca.gov/our-work/invest-protect/investment-strategies-commitments/fix-it-first/local-streets-and-roads-2

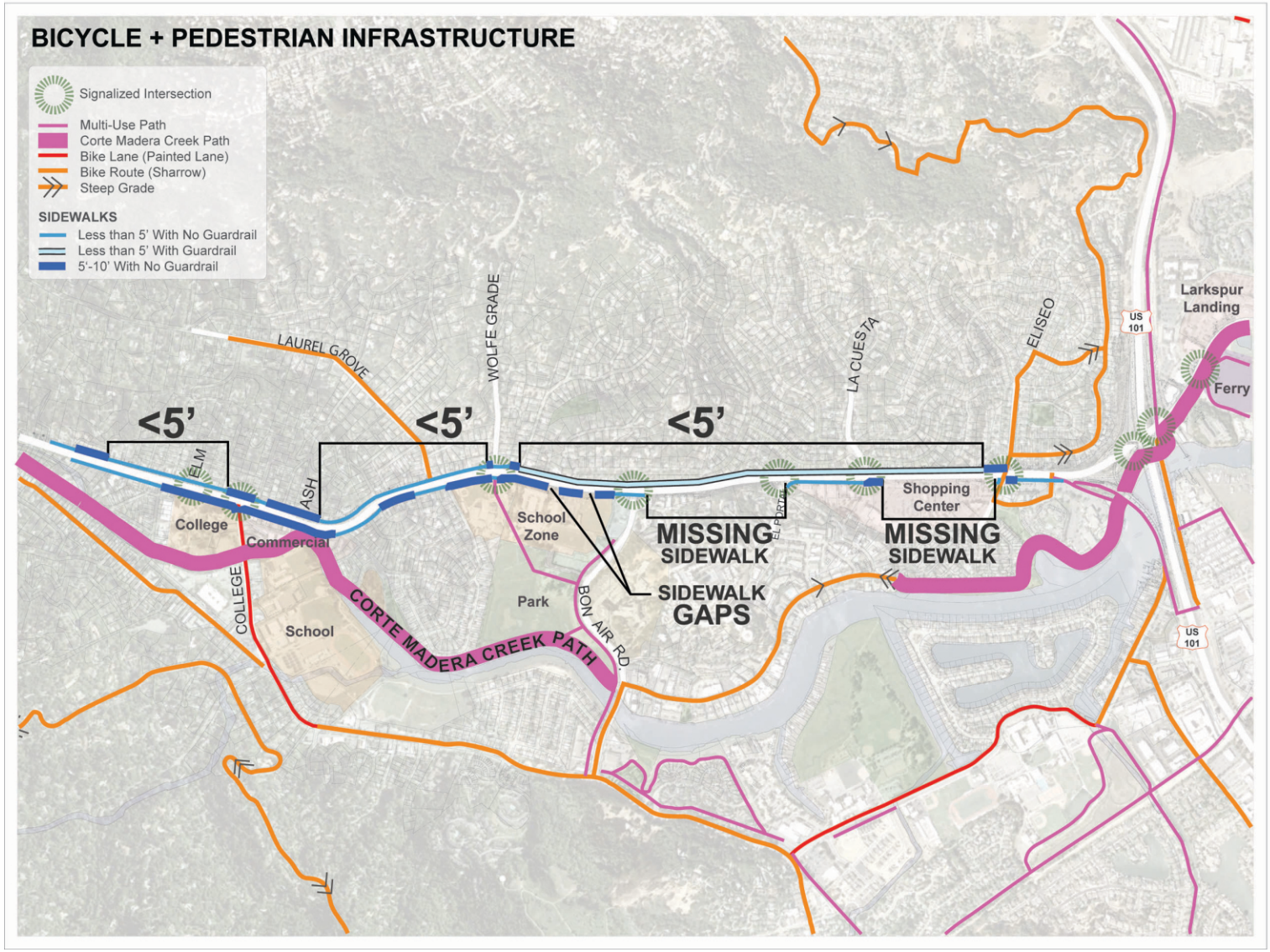

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FIGURE 3.6

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Existing Pedestrian and Bicycle Facilities

P:\BKF1501\g\EIR\Figure 3.6_Existing Pedestrian and Bicycle Facilities.cdr (5/8/2017)

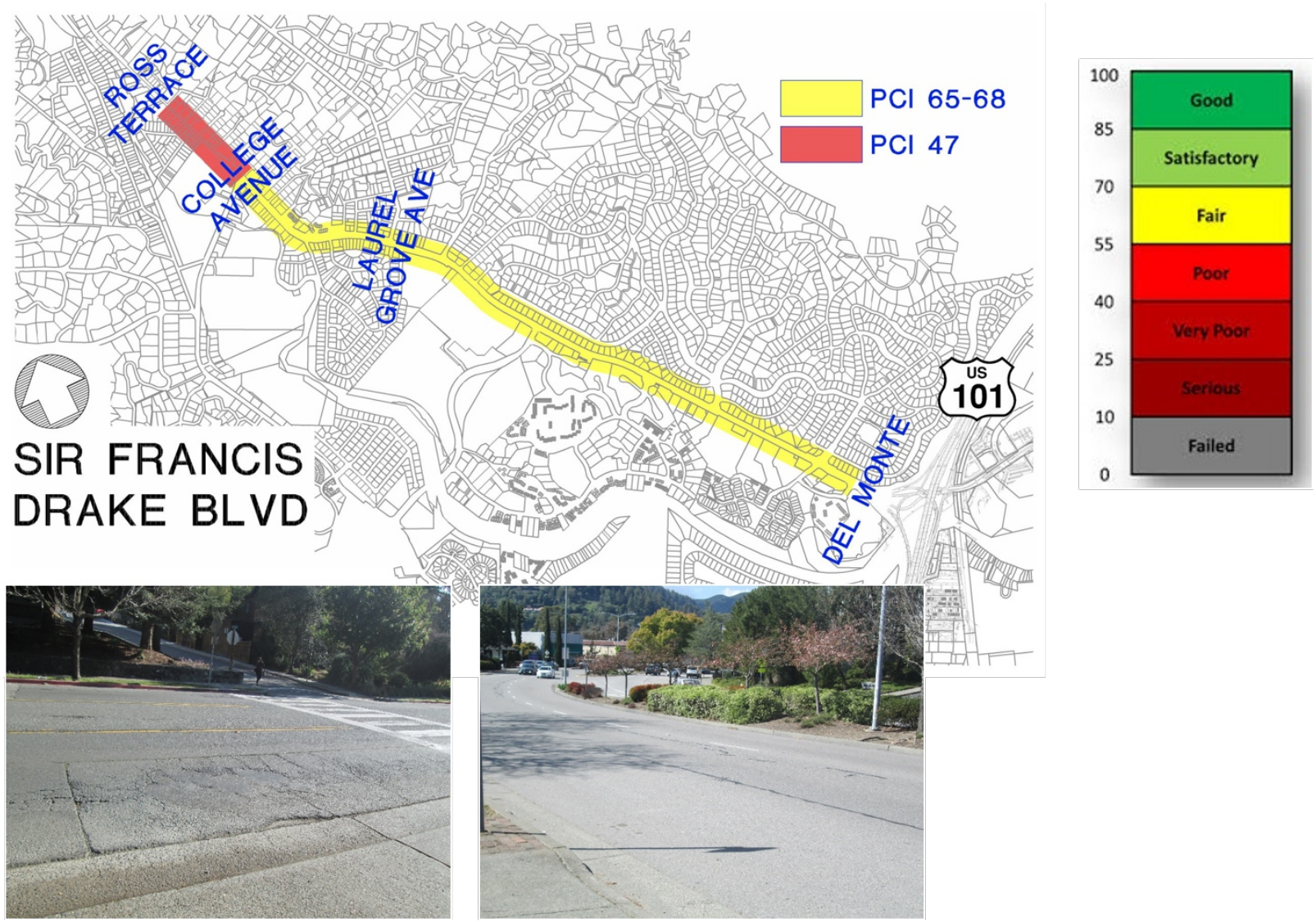

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FIGURE 3.7

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

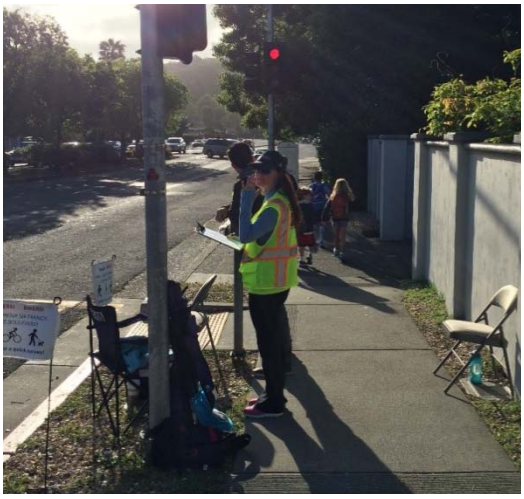
Sir Francis Drake Boulevard Rehabilitation Project

Existing Pavement Conditions

P:\BKF1501\g\EIR\Figure 3.7_Existing Pavement Conditions.cdr (5/8/2017)

evening commute periods, traffic volumes generally remain at near peak condition along the SFDB corridor from the morning to evening. Figures 3.8-A and 3.8-B illustrate daily traffic volumes per hour west of Elm Street, McAllister Avenue, Bon Air Road, and Eliseo Drive demonstrating that daily traffic volumes increase near Highway 101. Using real-time traffic flow data from Inrix, Figure 3.8-C illustrates the percentage of typical travel speeds along SFDB during morning and afternoon peak periods. The figure illustrates that travel speeds are slowest in the eastbound approach to Highway 101.

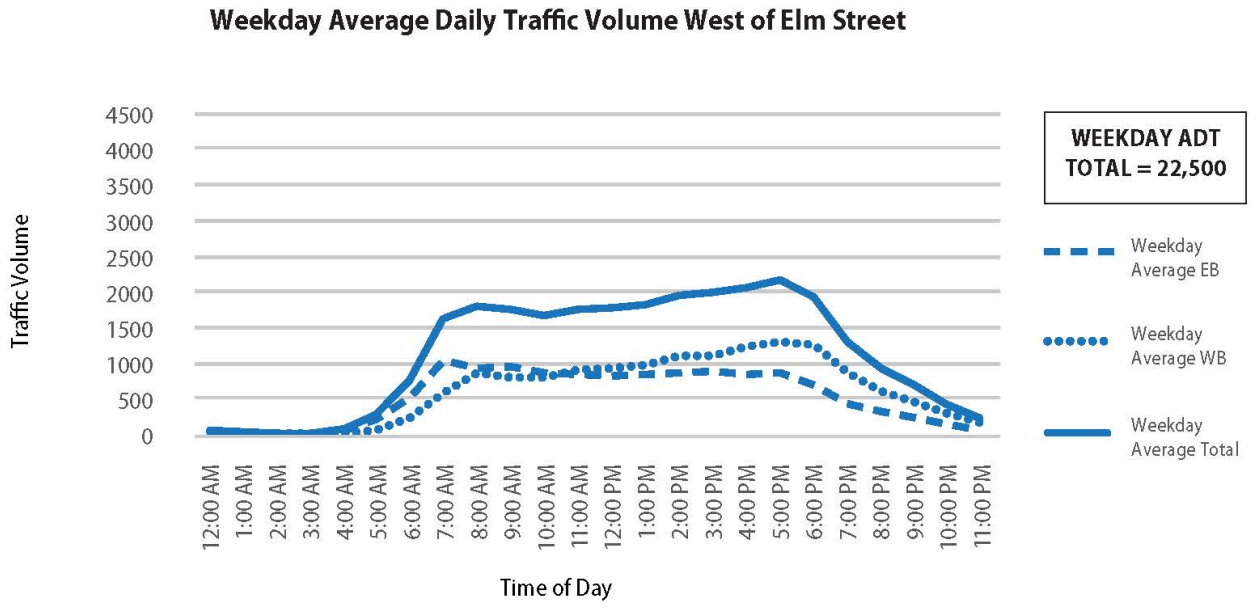
Pedestrian and Bicycle Traffic. To understand non-motorized use along SFDB, the County completed 84 intercept surveys[5] of bicyclists and pedestrians at six locations in the morning and afternoon periods of Saturday, April 25, 2015 and Wednesday, April 29, 2015. Key findings from the intercept surveys include:



Design Team conducting the intercept surveys

- Of the 84 total surveys, 67 were pedestrians, 15 were bicyclists, and 2 were using other mobility devices.
- Bicyclists and pedestrians interviewed on Saturday were more likely to be traveling along the corridor for exercise, recreation, and walking pets.
- Bicyclists and pedestrians interviewed on Wednesday were more likely to be traveling along the corridor for school-based trips.
- Bicyclists and pedestrians interviewed on Saturday were more often alone or walking their pet.
- More than half of interviewees walked or biked Sir Francis Drake Boulevard daily, and more than three quarters of interviewees walked or biked Sir Francis Drake Boulevard daily or weekly.
- The majority of women interviewed were adults between the ages of 31 and 60.
- The majority of men interviewed were either under 18 or 45 and older.
- Most trips for bicyclists and pedestrians were short, generated within the surrounding community.
- Route choice was overwhelmingly chosen based on the most convenient and direct route to a destination.
- Interviewed bicyclists and pedestrians expressed many concerns with the safety and comfort of crossing Sir Francis Drake Boulevard, both for signal controlled and uncontrolled intersections.
- Because Bacich Elementary School has a half-day schedule on Wednesdays, very few intercept surveys were collected on Wednesday afternoon at Wolfe Grade.

[5] Intercept surveys are surveys that are conducted in-person, generally in a public place or business. As described above, the County surveyed bicyclists and pedestrian traveling along SFDB to get input on non-motorized use of the project corridor.



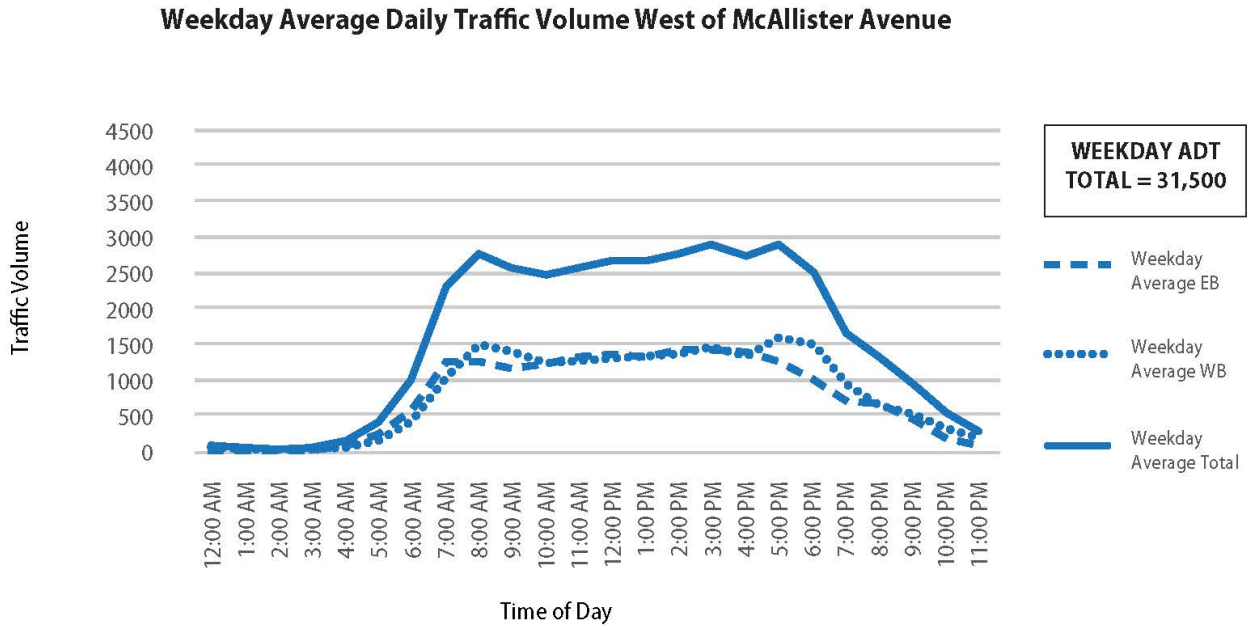


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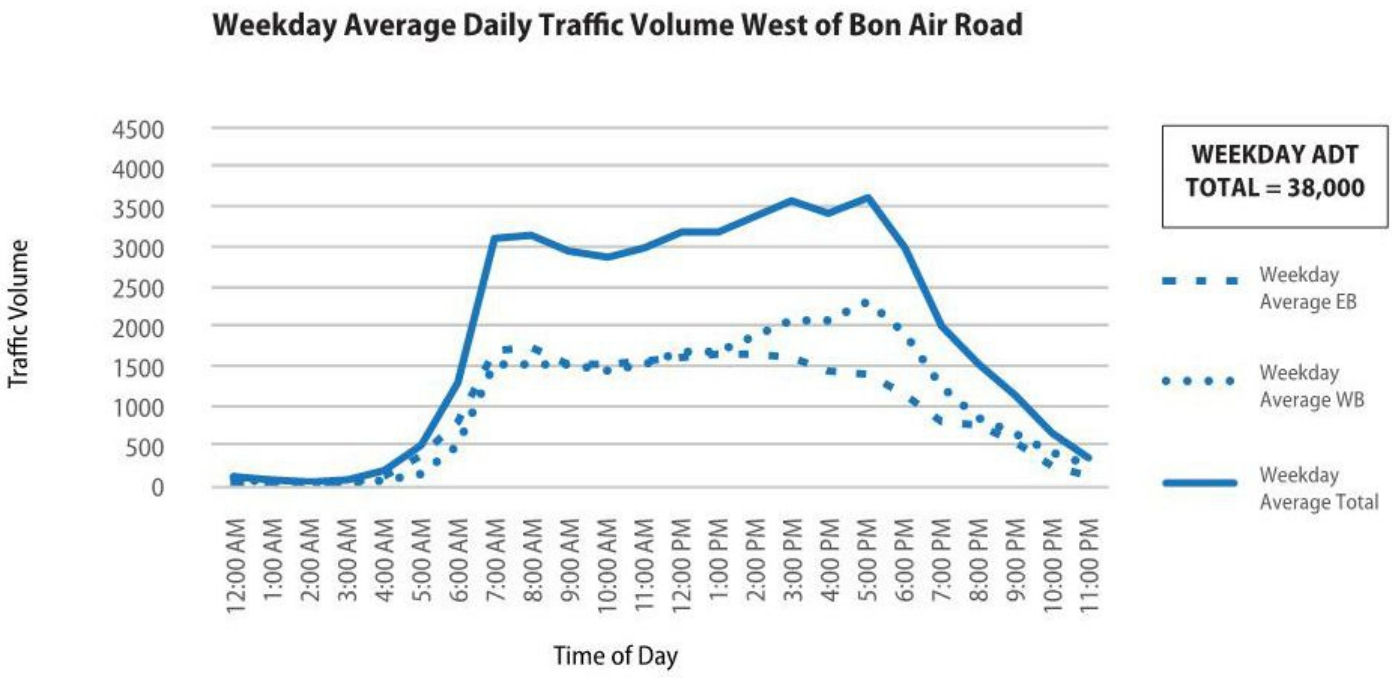
FIGURE 3.8-A

FIGURE NOT TO SCALE

SOURCE: Parisi Transportation Consulting, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Existing Average Daily Traffic



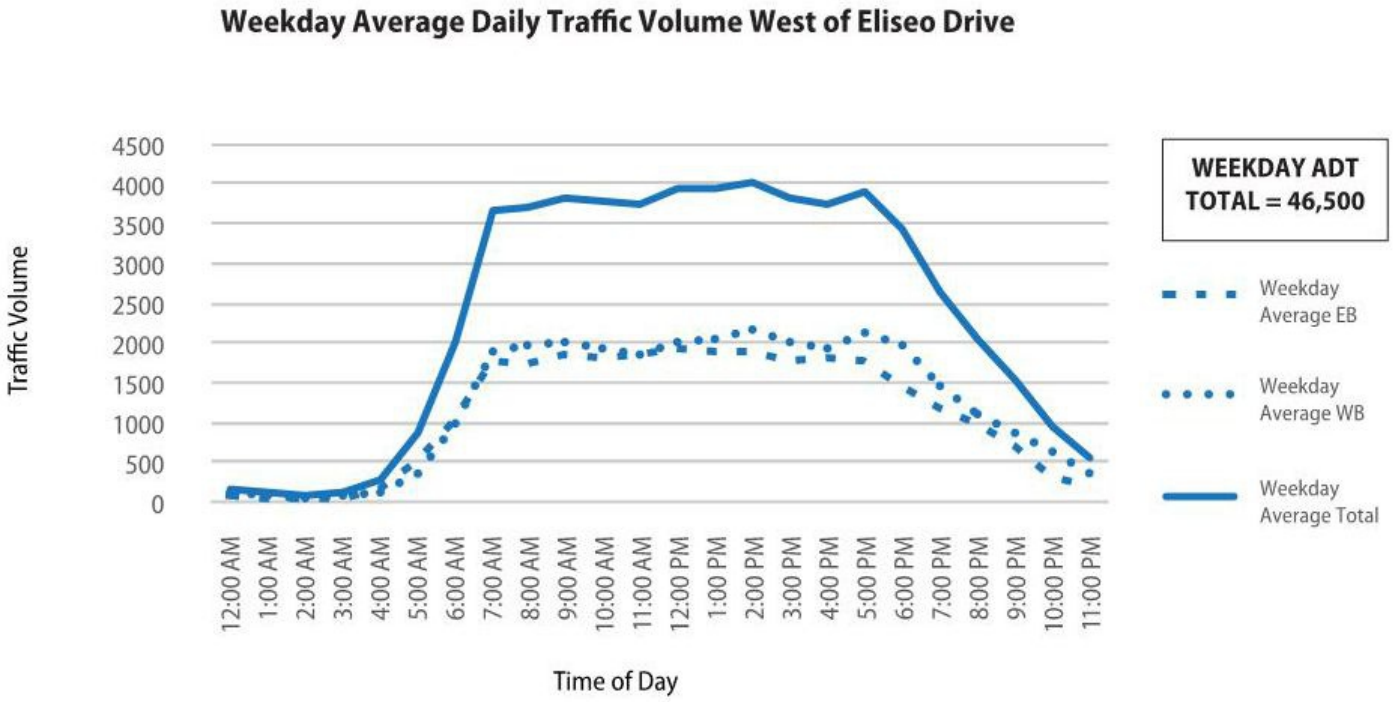


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FIGURE 3.8-B

FIGURE NOT TO SCALE

SOURCE: Parisi Transportation Consulting, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Existing Average Daily Traffic

P:\BKF1501\g\EIR\Figure 3.1-B_Regional Location.cdr (6/22/2017)

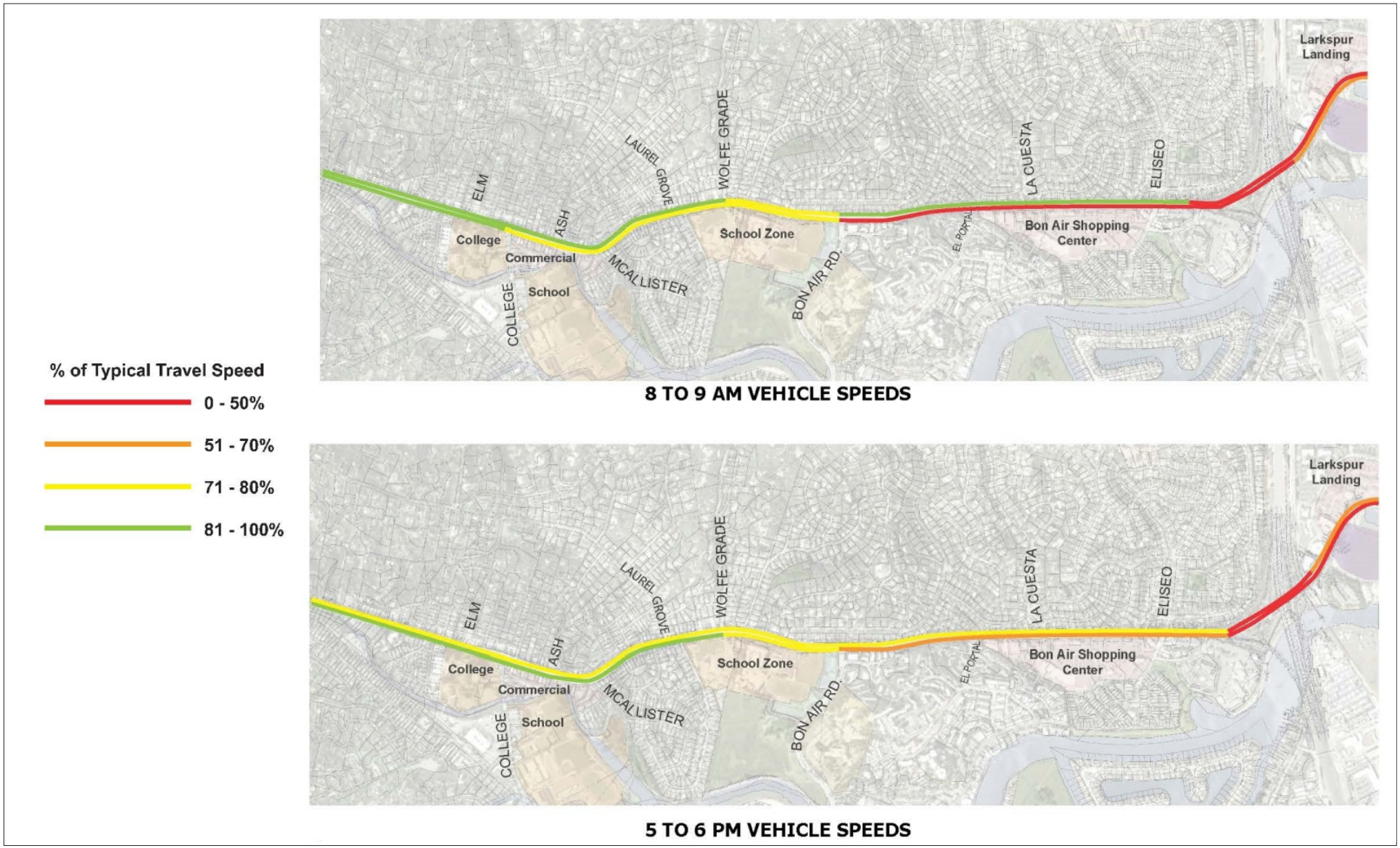

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FIGURE 3.8-C

FIGURE NOT TO SCALE

SOURCE: Parisi Transportation Consulting, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Vehicle Speeds During AM/PM Peak Hours

P:\BKF1501\g\EIR\Figure 3.8-C_Vehicle Speeds During AM/PM Peak Hours.cdr (5/8/2017)

A map detailing survey locations is provided in Figure 3.9. A summary of survey results is provided in Appendix D.

Collision History. In January 1965, a collision along SFDB occurred when an elderly driver intending to brake mistakenly applied the accelerator and collided with three girls walking to Bacich Elementary School, killing two and injuring the third. This collision led to the construction of the pedestrian overpass at Wolfe Grade as well as the metal beam guardrail along the north side of SFDB.

From data collected from the Statewide Integrated Traffic Records System between 2011 and 2015, 194 reported collisions occurred within the project limits. The distribution of collisions along the corridor is shown in Figure 3.10-A illustrating the highest number on the easterly segment, where vehicle volume is the highest. Figure 3.10-B illustrates the various types of collisions that have occurred. Within that time span, at the intersections of SFDB with Eliseo Drive and La Cuesta Drive, there have been22 and 17, respectively, rear end collisions, which may be related to congestion.

3.4.4 Existing MMWD Pipeline

Between Ross Terrace and Manor Road, MMWD has an existing cast iron pipe that was installed as early as 1920, and the pipe is reaching the end of its useful life. The cast iron segments of the pipeline have experienced numerous breaks in recent years, which is a further indication of its near end-of-life condition. The other segment of pipe that has been evaluated by MMWD for upgrades is an existing 14-inch-diameter pipe originally installed in 1956 that crosses under Highway 101 north of SFDB. Those portions of the existing pipeline that are not scheduled for replacement have previously been replaced with welded steel pipe.

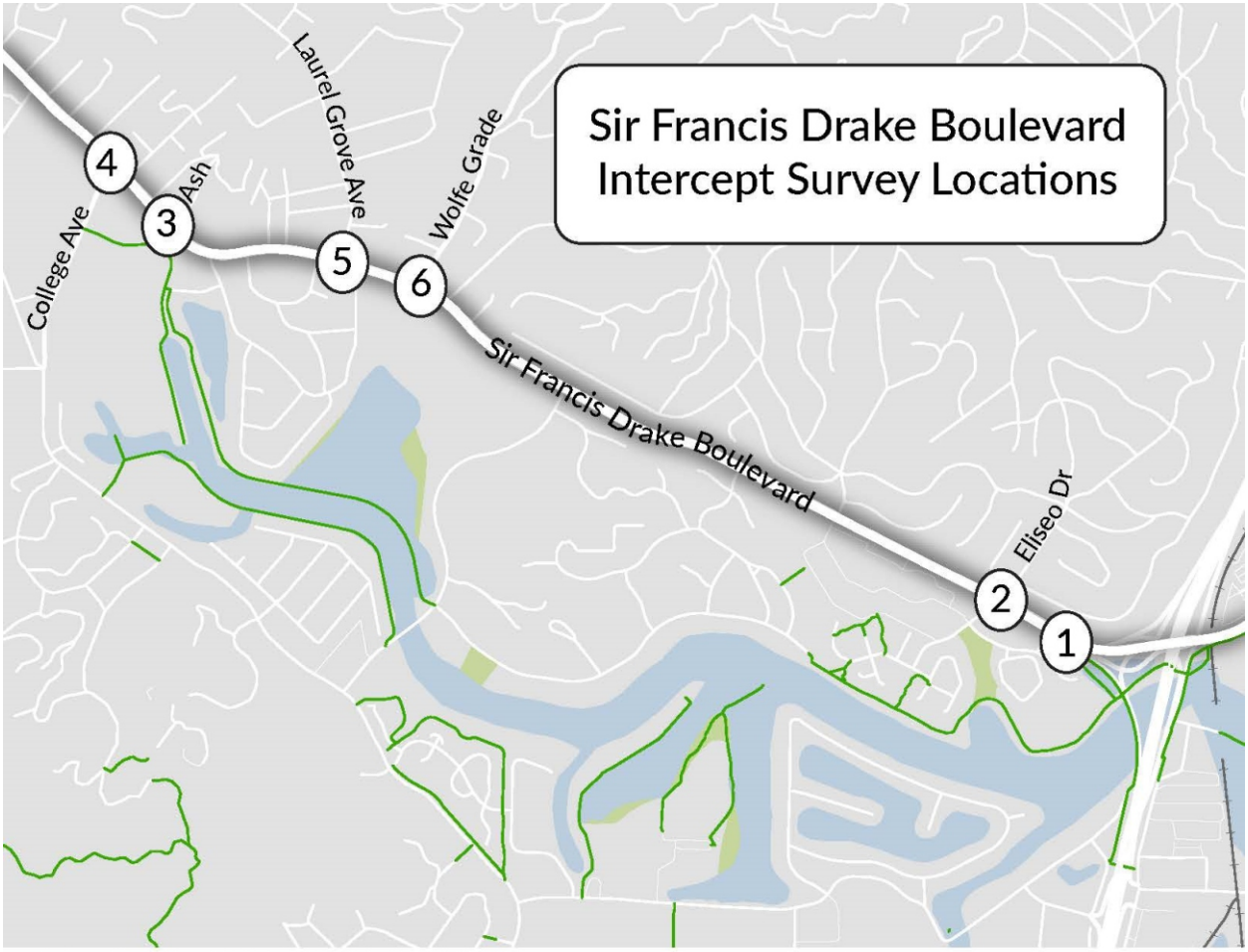
3.5 PROPOSED PROJECT

Based on the project objectives listed in Section 3.2, the community and stakeholders established a preferred list of improvements for SFDB as described below.

3.5.1 Congestion Relief and Maintenance

The project would complete basic maintenance and relieve congestion along SFDB by rehabilitating pavement, adding a third lane eastbound from El Portal Drive to Highway 101, modifying several intersections to allow for simultaneous left turn movements or other traffic enhancements, and adding a second westbound-to-southbound left turn lane at College Avenue. In addition, the project would install infrastructure supporting a future adaptive signal technology. Proposed project elements are described in detail below.

Pavement Rehabilitation. The project would fix damaged pavement, mill the surface, and place an asphalt overlay with a pavement fabric in between lifts on the roadway between Ross and Highway 101. The road would be striped to include an eastbound third lane from El Portal Drive to Highway 101. In conjunction with the asphalt repair, the project would update curb ramps at intersections to



Saturday, April 25, 9:00AM - 1:00PM

1 200' East of Del Monte 2 Eliseo Drive/Barry Way	22	4	0
Saturday, April 25, 2:00PM - 6:00PM			
3 Ash Avenue 4 College Avenue	21	6	1
Wednesday, April 29, 6:00AM - 10:00AM			
5 Laurel Grove Avenue	21	3	0
Wednesday, April 29, 2:30PM - 6:30PM			
6 Wolfe Grade (Minimum day at Bacich)	3	2	1

LSA

FIGURE 3.9

Sir Francis Drake Boulevard Rehabilitation Project

Intercept Survey Location and Number

SOURCE: BKF Engineers, 2017

P:\BKF1501\g\EIR\Figure 3.9_Intercept Survey Location and Number.cdr (5/4/2017)

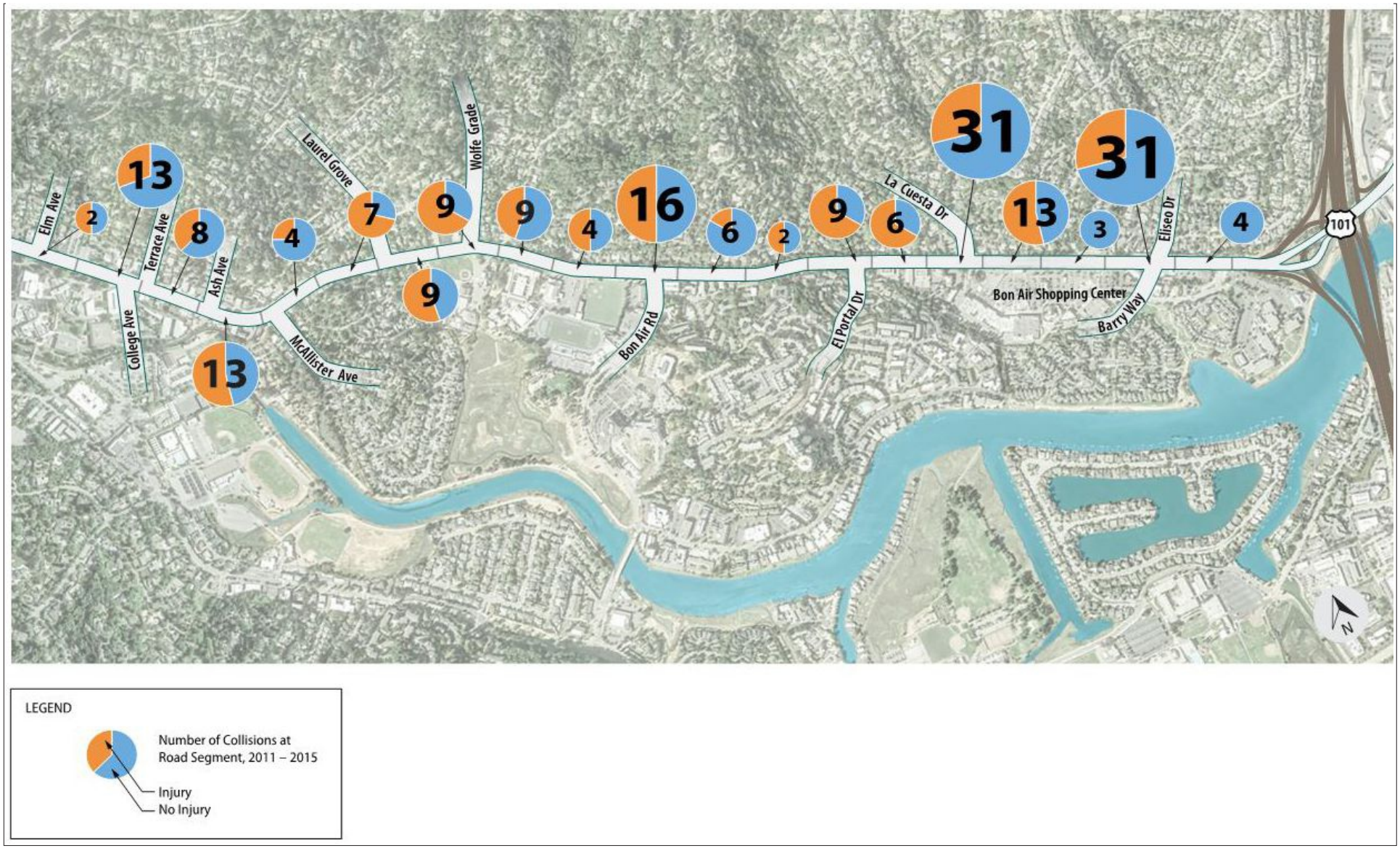


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FIGURE 3.10-A

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FIGURE NOT TO SCALE

SOURCE: Parisi Transportation Consulting, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Severity of Collisions at Select Locations

P:\BKF1501\g\EIR\Figure 3.10-A_Vehicle Collision History.cdr (6/22/2017)

LEGEND

Bike	Hit Object	Rear End
Broadside	Other	Sideswipe
Head-on	Overturned	Vehicle / Pedestrian

LSA

FIGURE 3.10-B

N

FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Type of Collisions at Select Locations

P:\BKF1501\g\EIR\Figure 3.10-B_Type of Collisions at Select Locations.cdr (6/22/2017)

comply with the Americans with Disabilities Act[6].

As part of the pavement rehabilitation, the metal beam guardrail would be removed and a new cable fence installed from Eliseo Drive to Wolfe Grade.

Signal Technology Modifications. The project would install new traffic signal controllers as well as poles, mast arms, and signal faces at all signalized intersections between College Avenue and Eliseo Drive using the latest technology available. Replacing existing signal equipment will improve the flow of traffic.

Furthermore, the project would install conduits, pull boxes, fiber optic cable, and Ethernet switches to interconnect the signals allowing for the future implementation of an adaptive traffic signal system. In locations where there is only a partial replacement of the traffic signal, upgrades to the signal would still include control upgrades and signal retiming.

Eliseo Drive Intersection. The Eliseo Drive/Barry Way intersection has the highest volume of traffic within the project area and its side streets operate in split phase, which reduces its efficiency, increasing traffic delay and congestion. Split phase means that traffic turning left from either Barry Way (north bound) or Eliseo Drive (south bound) cannot occur simultaneously as the turning movements are in conflict due to the intersection's geometry. This project element proposes to modify the lane configuration on the north side of the intersection to allow for simultaneous left turn movements from both the north and south bound approaches to SFDB. To accommodate this change, the median on the north side of the intersection would be shifted to the east. Additional modifications at the intersection would include adjustments to allow for the third eastbound travel lane and removal of the crosswalk along the north side of the intersection and relocating it to the Eliseo Drive intersection with Corte Cayuga/Via La Cumbre. Figure 3.11-A illustrates the modifications to the intersection.

Studies completed at the intersection found that the left turn movement volumes from SFDB to Barry Way are often unbalanced, meaning that more vehicles are using the rightmost left turn lane as they seek to enter the Bon Air Shopping Center. This condition creates additional backup and congestion within the Eliseo Drive intersection. To better balance the turn movement and reduce congestion on SFDB, the project would modify the driveway entrance to Bon Air Shopping Center from Barry Way to provide access from both travel lanes (see Figures 3.11-B and 3.11-C).

La Cuesta Drive Intersection. The La Cuesta Drive intersection has the second highest volume of traffic in the project corridor. The addition of the third striped eastbound lane would require modifications to the southeast corner in order to shift the curb south. Like the Eliseo Drive intersection improvements, this project element would modify the intersection configuration to

[6] The Americans with Disabilities Act of 1990 (ADA) is a federal law that prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation. In 2013, the Departments of Justice and Transportation issued a directive that requires agencies to provide curb ramps when streets, roads, and highways are altered through resurfacing.

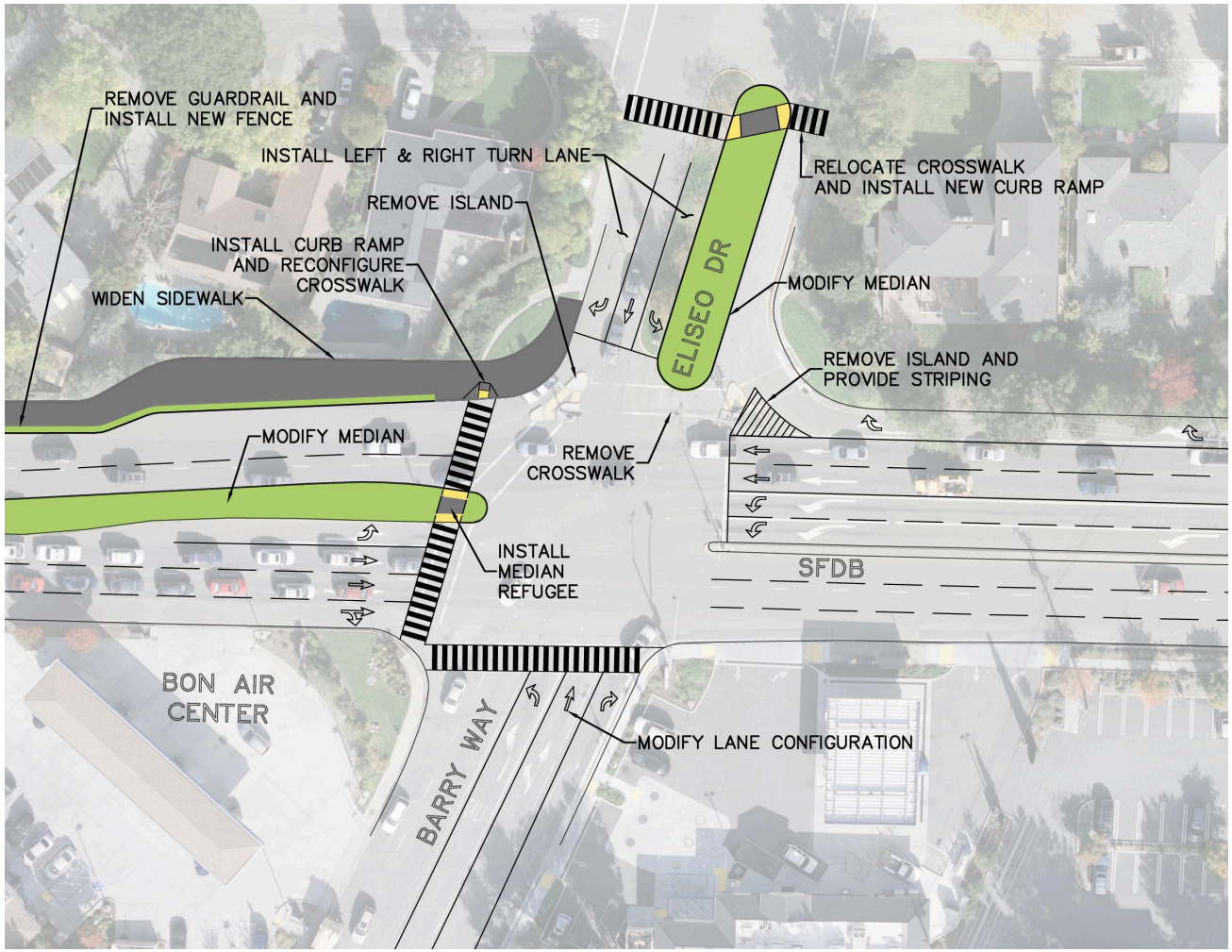

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FIGURE 3.11-A

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Eliseo Drive Intersection Modifications

P:\BKF1501\g\EIR\Figure 3.11-A_Proposed Eliseo Intersection Modifications.cdr (5/8/2017)

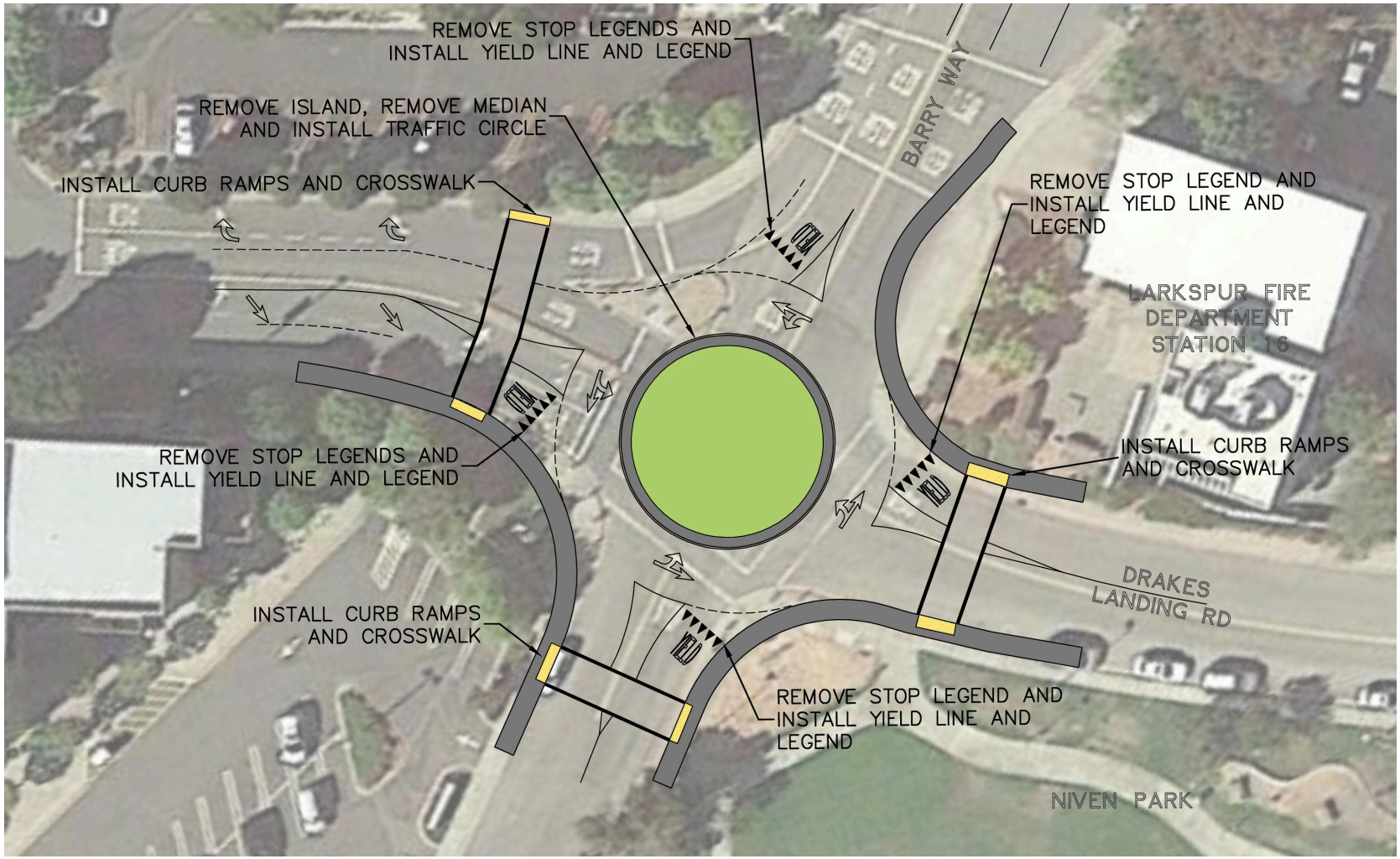

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FIGURE 3.11-B

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Bon Air Center Driveway Modifications

P:\BKF1501\g\EIR\Figure 3.11-B_Proposed Bon Air Center Driveway Modifications.cdr (5/8/2017)

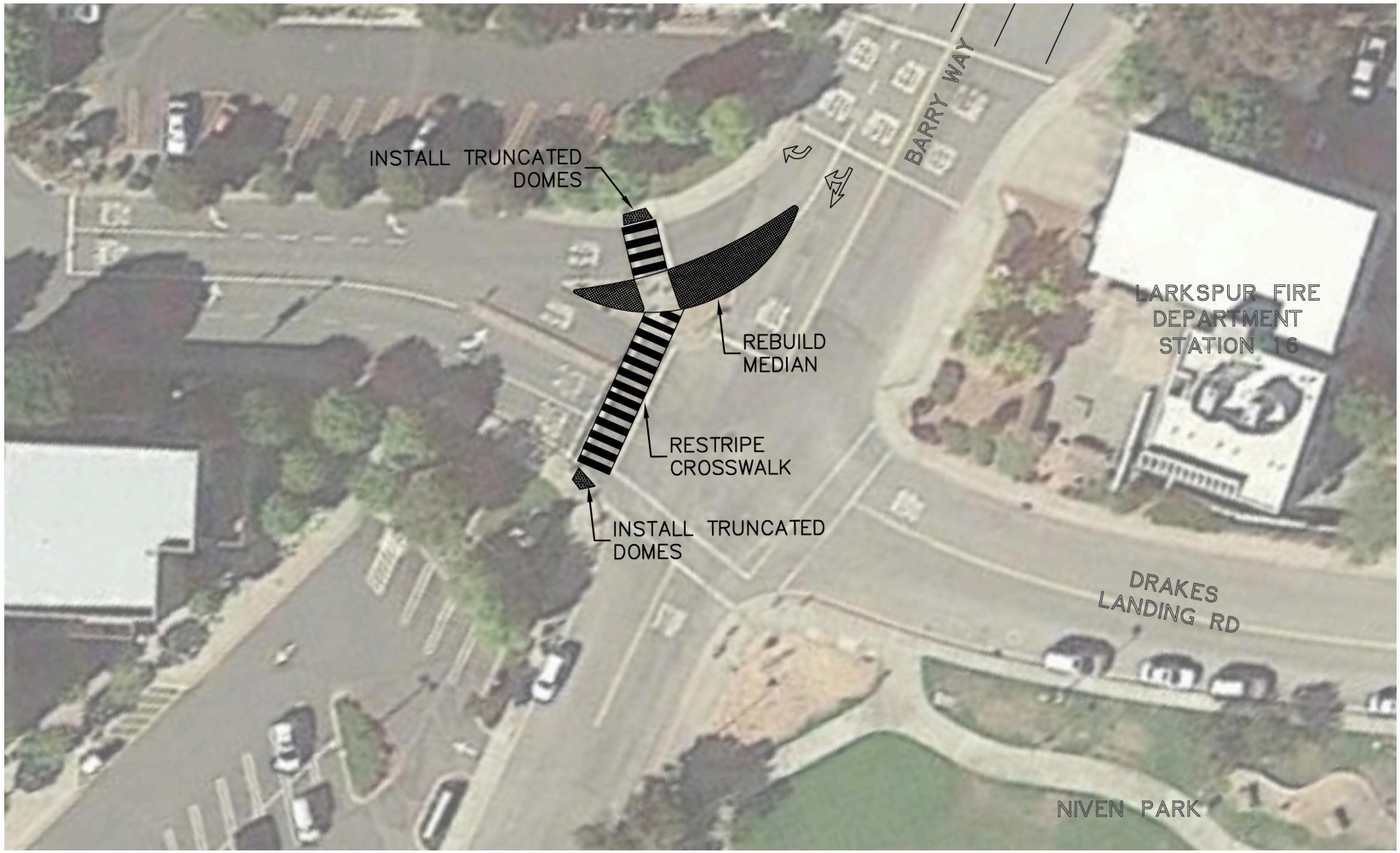

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FIGURE 3.11-C

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Bon Air Center Driveway Modifications – Option 2

P:\BKF1501\g\EIR\Figure 3.11-C_Proposed Bon Air Center Driveway Modifications – Option 2.cdr (6/22/2017)

allow for simultaneous north-south left turn operation. The lane configuration on both the northwest and northeast corners would be modified to operate as a standard intersection. Figure 3.12 shows the proposed modifications to the La Cuesta Drive intersection.

El Portal Drive Intersection. The additional third lane eastbound striping would begin at the El Portal Drive intersection and would require modifications to the intersection and traffic signal to accommodate the third lane. The project would create standard intersection right turn lanes on the south side of the intersection and provide accessible curb ramps at all crossings. Figure 3.13 shows the proposed modifications to the El Portal Drive intersection.

Bon Air Road Intersection. The Bon Air Road intersection is a key linkage between the sidewalk on the north side of SFDB and the Corte Madera Creek trail and Marin General Hospital to the south. To improve pedestrian circulation, standard intersection right turn lanes would be created on the south side, the sidewalks would be widened, and the crosswalk would be relocated from the east side to the west side of SFDB. Additionally, the traffic signal phasing and pole locations would be modified to accommodate the new layout. Figure 3.14 shows the proposed modifications to the Bon Air Road intersection.

Wolfe Grade Intersection. Given that SFDB would be repaved, intersections with existing crossings must be modified to provide accessible curb ramps and crossings in compliance with the ADA. The existing pedestrian overcrossing at Wolfe Grade is currently non-compliant. The proposed project would install an at-grade crosswalk at the west side of the intersection. To maintain existing traffic capacity through the intersection, the project would widen the sidewalk, thereby reducing the width of the street crossing, and minimizing the time required for the pedestrians to cross the street. In addition, the intersection's signal phasing would be modified to be more efficient. Other pedestrian safety improvements would include creation of a standardized intersection configuration. Figure 3.15 shows the proposed modifications to the Wolfe Grade intersection.

College Avenue Intersection. Based on traffic observations and collision analysis, westbound traffic along SFDB desiring to turn left onto College Avenue often backs up into the through travel lanes, creating delay and causing an increase in collisions, particularly as westbound through traffic travels through SFDB's curve near McAllister Avenue. Backups create sight distance issues for motorists and pedestrians, especially those crossing SFDB at Ash Avenue. The proposed project would provide dual left turn pockets to accommodate the volume of vehicles, reducing backup into the through travel lanes, and reducing congestion in the intersection. To accommodate the second left turn lane and maintain the existing number of on street parking stalls along SFDB, up to four trees would be removed along the north side of the road. Figure 3.16 shows the proposed modifications to the College Avenue intersection.

3.5.2 Pedestrian Safety Improvements

To enhance pedestrian safety, various improvements would be implemented, including relocating the transit stop near Kentfield Fire Station, reducing crossing distances, modifying intersections, and widening sidewalks. Proposed project elements are described in detail below.

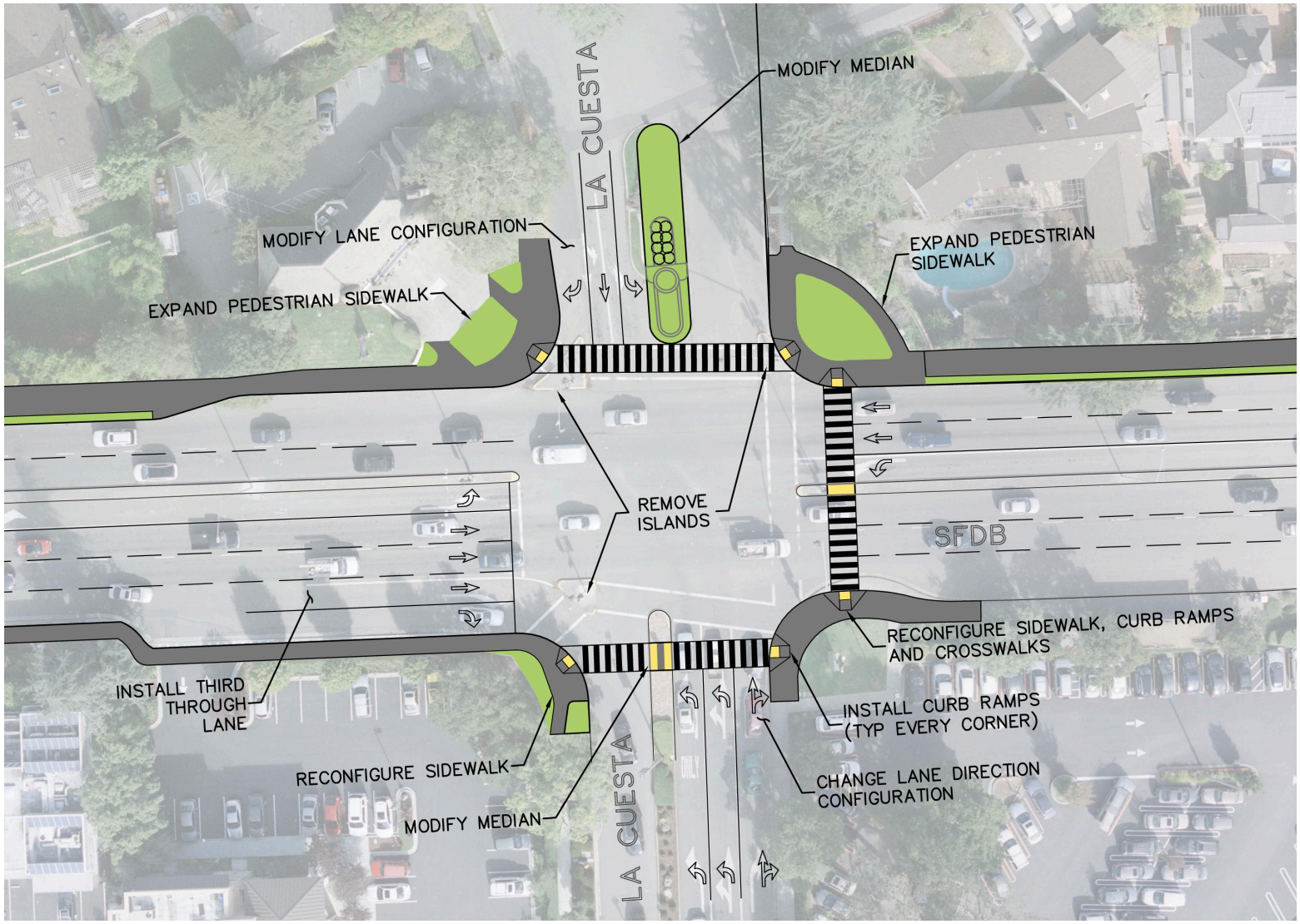

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FIGURE 3.12

FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed La Cuesta Drive Intersection Modifications

P:\BKF1501\g\EIR\Figure 3.12_Proposed La Cuesta Intersection Modifications.cdr (5/8/2017)

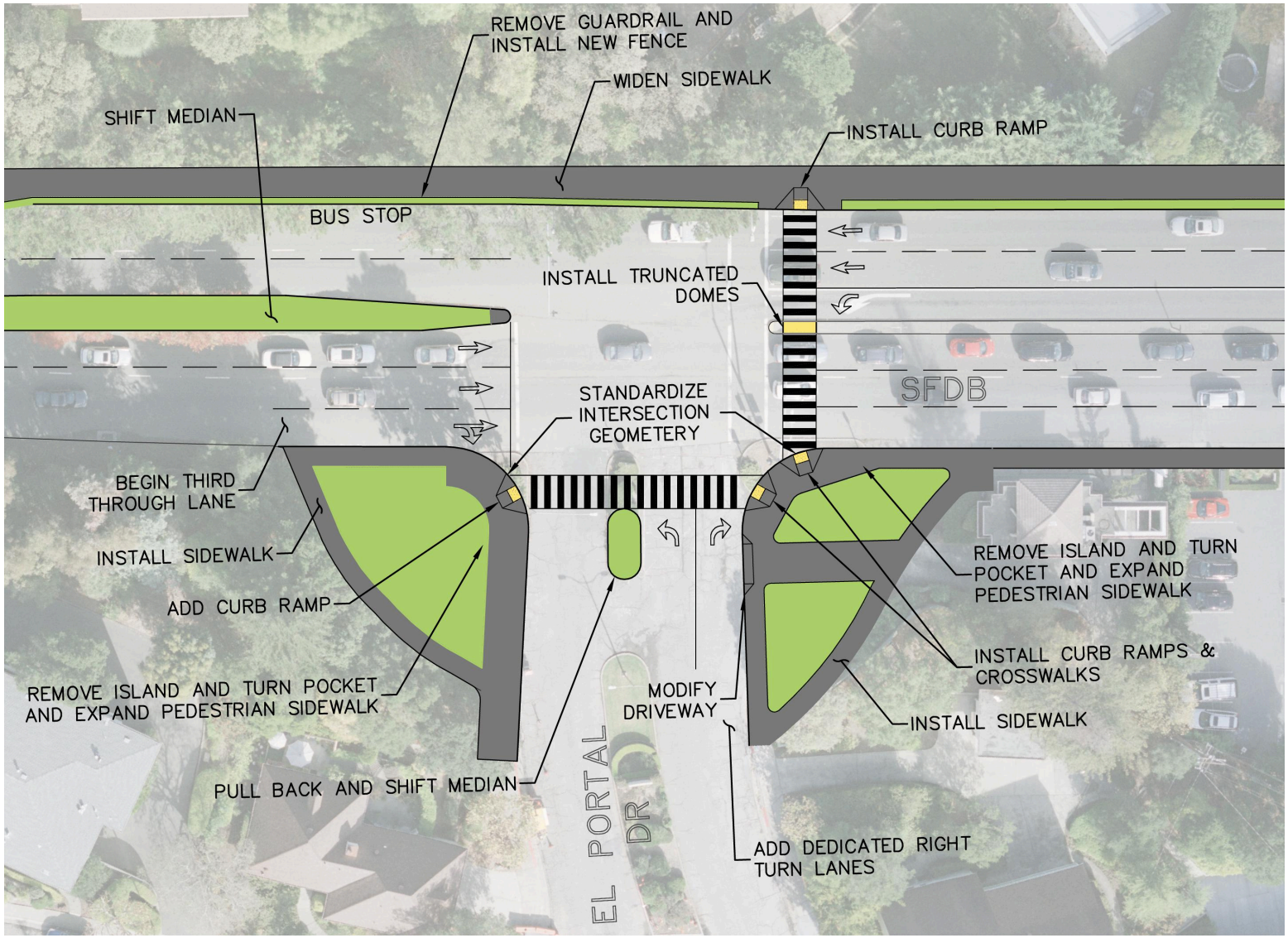

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FIGURE 3.13

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed El Portal Drive Intersection Modifications

P:\BKF1501\g\EIR\Figure 3.13_Proposed El Portal Drive Intersection Modifications.cdr (5/8/2017)

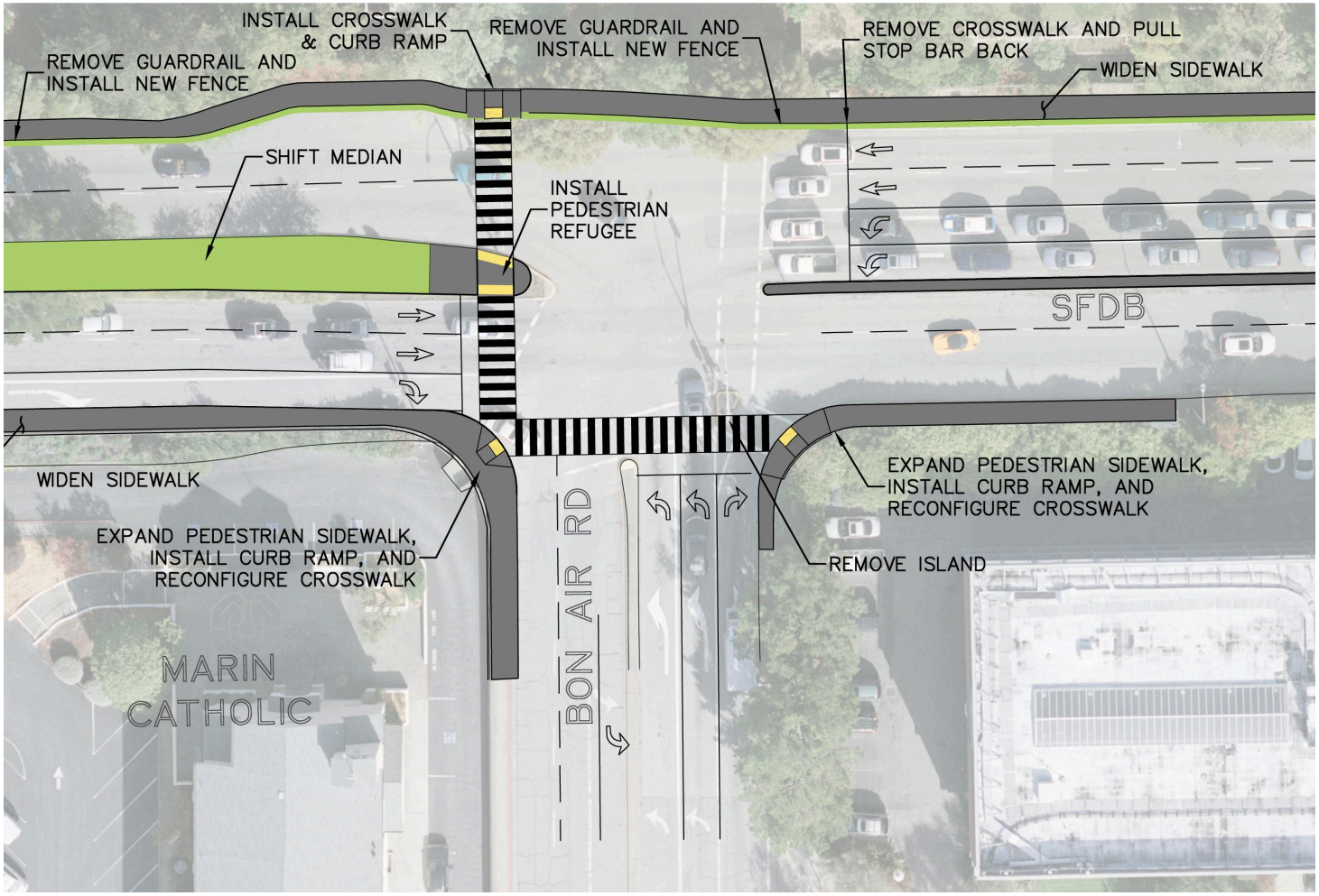

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FIGURE 3.14

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Bon Air Road Intersection Modifications

P:\BKF1501\g\EIR\Figure 3.14_Proposed Bon Air Road Intersection Modifications.cdr (5/8/2017)

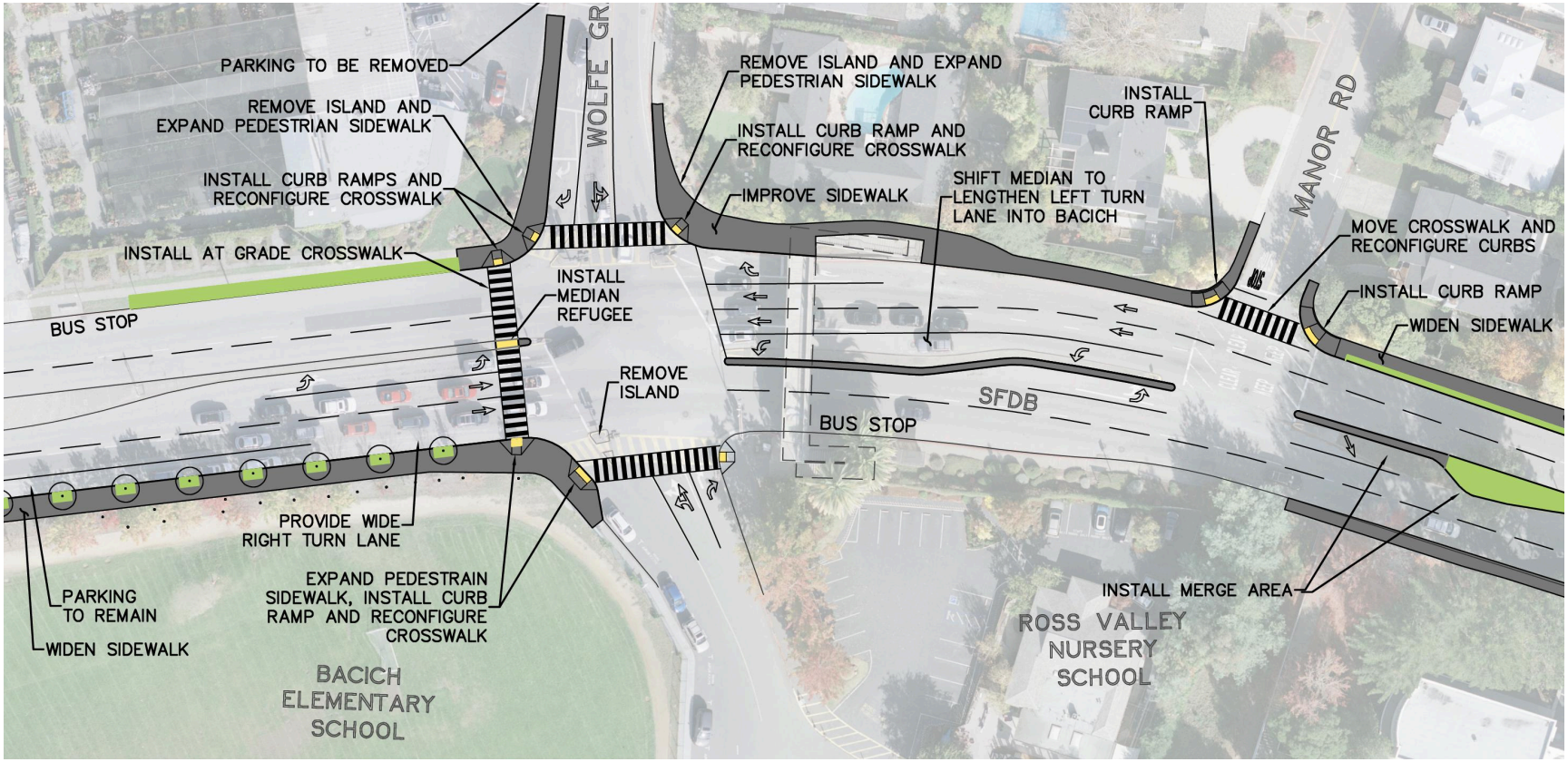

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FIGURE 3.15

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Wolfe Grade Intersection Modifications

P:\BKF1501\g\EIR\Figure 3.15_Proposed Wolf Grade Road Intersection Modifications.cdr (5/8/2017)

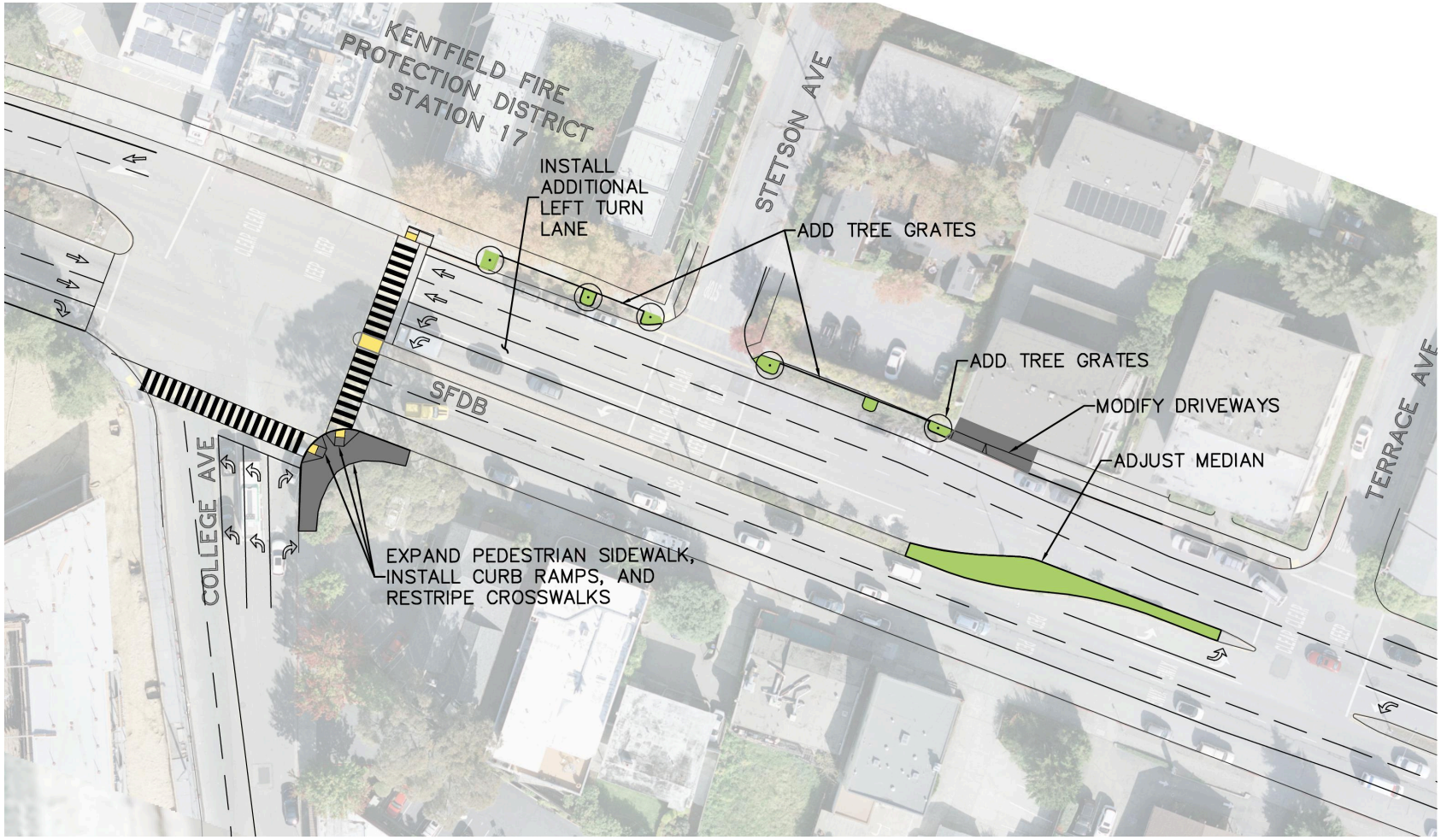

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FIGURE 3.16

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed College Avenue Intersection Modifications

P:\BKF1501\g\EIR\Figure 3.16_Proposed College Avenue Intersection Modifications.cdr (5/8/2017)

Elm Avenue Transit Stop. Marin Transit and the College of Marin collaborated to revise the location of the existing bus stop located along the north side of SFDB just east of Maple Avenue. At the current location, a large number of pedestrians cross SFDB from the transit stop at an uncontrolled intersection. By relocating the transit stop to the next block just east of Elm Avenue, pedestrians can cross SFDB at a signalized intersection. The College of Marin has agreed to provide right-of-way to create the transit stop. Figure 3.17 shows the proposed modifications to the Elm Avenue Transit Stop.

Ash Avenue Intersection. Ash Avenue is one of two non-signalized marked pedestrian crossings of SFDB within the project limits. The proposed project would add rectangular rapid flashing beacons or a pedestrian hybrid beacon[7] and a high visibility crosswalk, enhancing the visibility of pedestrians crossing SFDB. Furthermore, the proposed project would remove the existing SFDB westbound left turn lane currently used by motorists for U-turns to accommodate a pedestrian refuge area. Figure 3.18 shows the proposed modifications to the Ash Avenue intersection.

West McAllister Avenue Intersection. In order to reduce the crossing distance, the proposed project would create standard intersection right turn lanes on the intersection's west side and would re-align the West McAllister Avenue approach to be perpendicular to SFDB. In addition, the proposed project would provide a receiving lane within the median of SFDB for vehicles turning left from McAllister Avenue to westbound SFDB. Figure 3.19 shows the proposed modifications to the West McAllister Avenue intersection.

Laurel Grove Avenue Intersection. This intersection is a key crossing route to school for children going to both Bacich Elementary School and Kent Middle School, and the sidewalks on the north side of the intersection have inadequate area to accommodate children during the morning period. The project would create standard intersection right turn lanes and widen the sidewalks to allow adequate area for pedestrians to stage as they await crossing of SFDB. On the south side of SFDB, the project would widen the sidewalk from Laurel Grove Avenue to East McAllister Avenue. Figure 3.20 shows the proposed modifications to the Laurel Grove Avenue intersection.

Bacich Elementary School Frontage. As part of the proposed project, the sidewalk on the south side of SFDB would be widened between East McAllister Avenue and Wolfe Grade. The additional sidewalk width would provide area for people exiting vehicles as well as pedestrians travelling along the sidewalk. On-street parking would remain, but up to six trees (less than 6 inches in diameter) would be removed. Figure 3.21 shows the proposed modifications to the Bacich Elementary School frontage.

Manor Road. Manor Road is a key safe route to school for children and parents going to Bacich Elementary School. The proposed project would provide safety improvements at Manor Road by improving motorists' sight distance of pedestrians as they approach the crosswalk by both horizontally and vertically re-aligning the sidewalk and intersection. Figure 3.22 shows the proposed improvements to Manor Road.

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[7] A Pedestrian Hybrid Beacon or High-Intensity Activated Crosswalk (HAWK) - type beacon is a traffic control device used to stop road traffic and allow pedestrians to cross safely. The purpose of the pedestrian hybrid beacon is to allow protected pedestrian crossings, stopping road traffic only as needed.

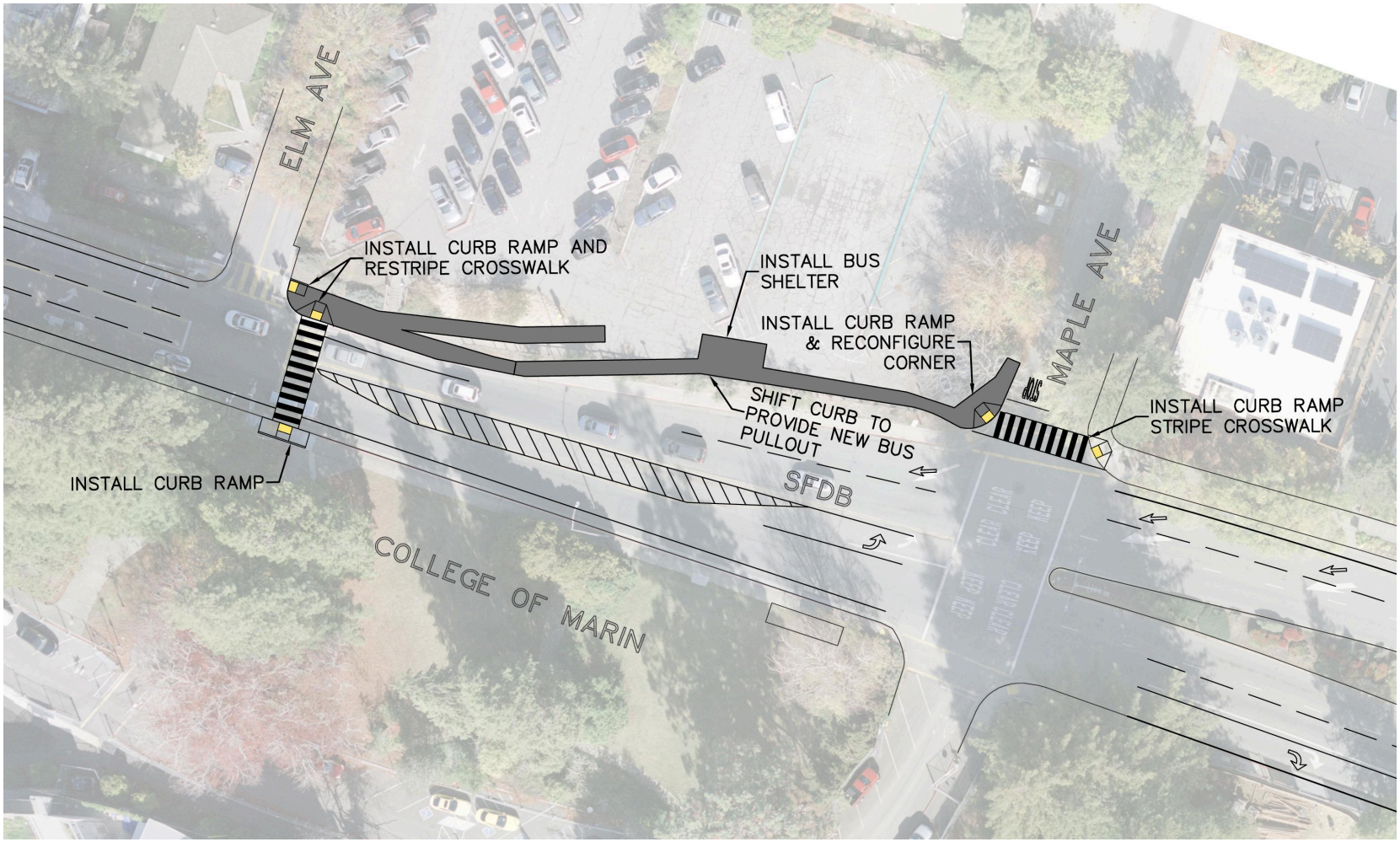

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FIGURE 3.17

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Elm Avenue Transit Stop Modifications

P:\BKF1501\g\EIR\Figure 3.17_Proposed Elm Avenue Transit Stop Modifications.cdr (5/8/2017)

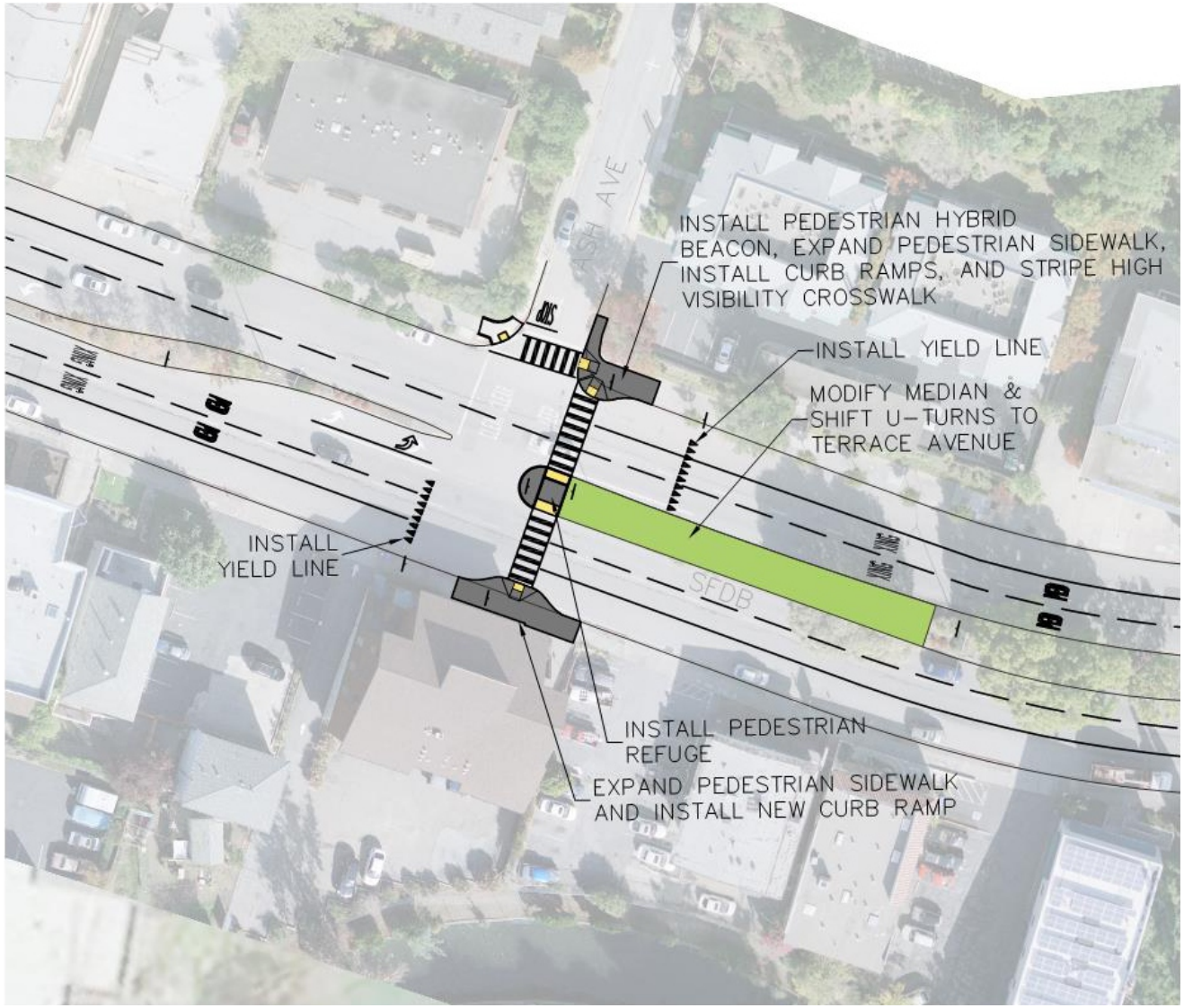

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FIGURE 3.18

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Ash Avenue Intersection Modifications

P:\BKF1501\g\EIR\Figure 3.18_Proposed Ash Avenue Intersection Modifications.cdr (3/13/2018)

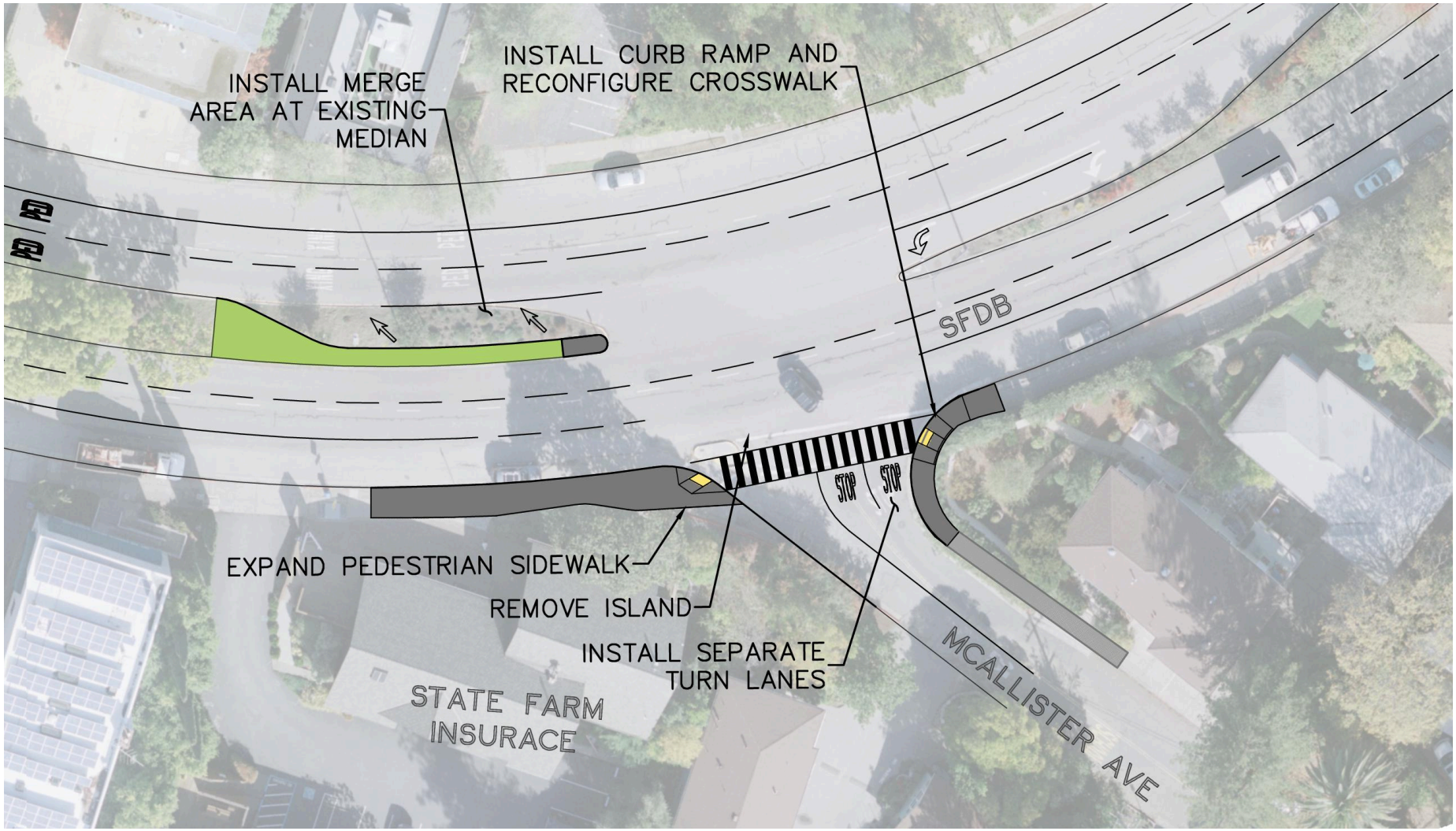

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FIGURE 3.19

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed West McAllister Avenue Intersection Modifications

P:\BKF1501\g\EIR\Figure 3.19_Proposed West McAllister Avenue Intersection Modifications.cdr (5/8/2017)

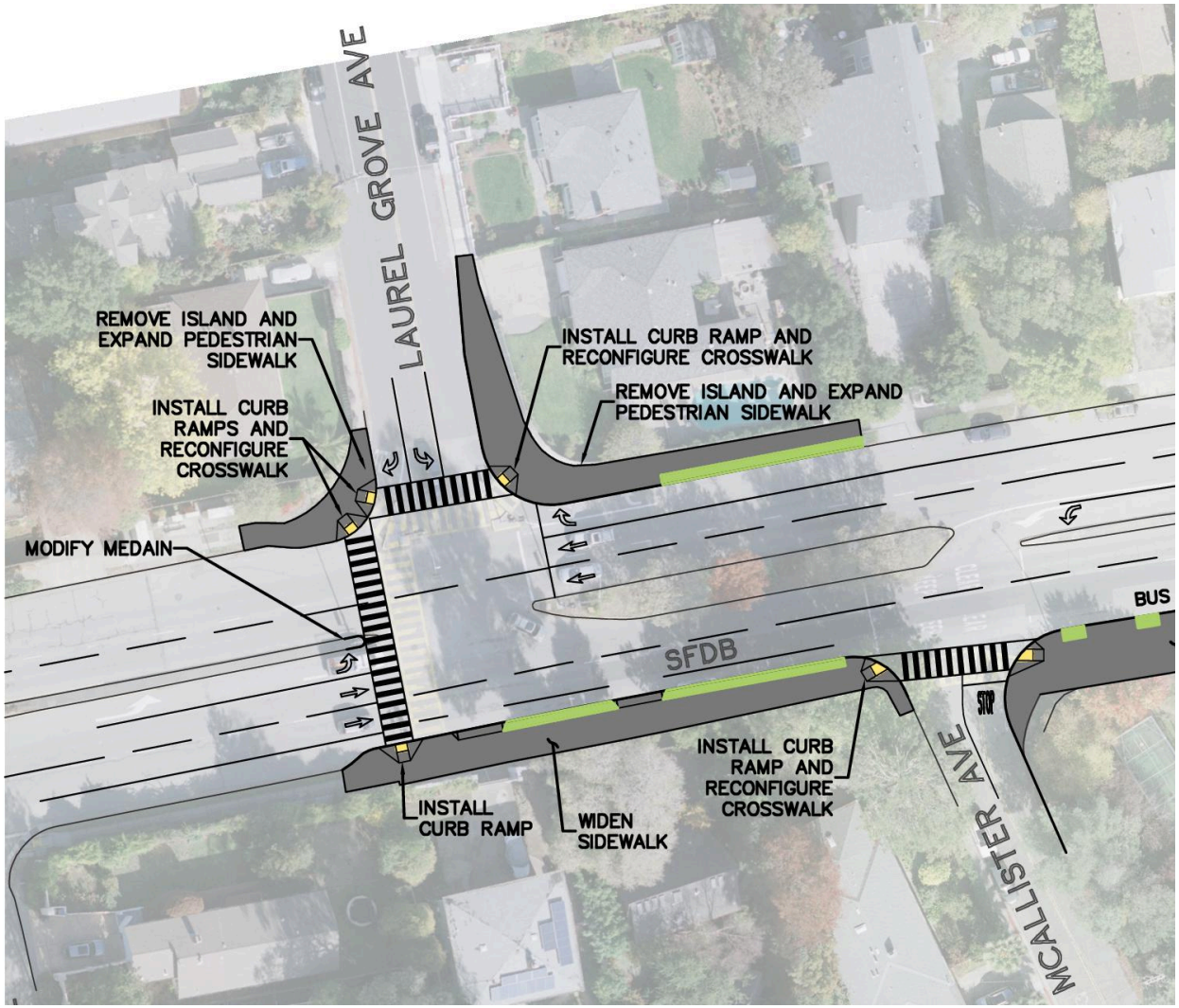

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FIGURE 3.20

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project Proposed Laurel Grove Avenue Intersection Modifications

P:\BKF1501\g\EIR\Figure 3.20_Proposed Laurel Grove Intersection Modifications.cdr (5/8/2017)

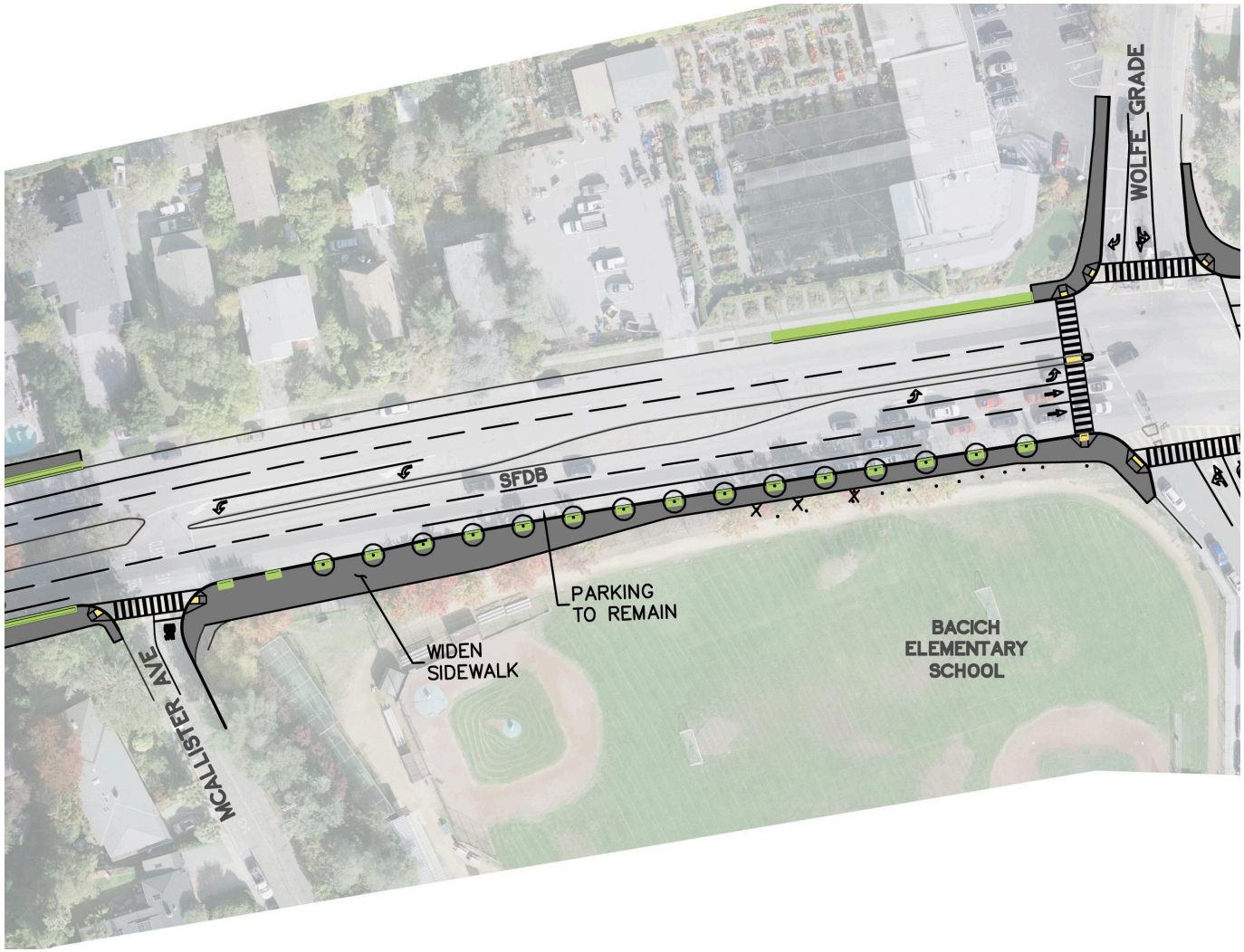

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FIGURE 3.21

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Bacich Elementary School Frontage Modifications

P:\BKF1501\g\EIR\Figure 3.21_Proposed Bacich Elementary School Frontage Modifications.cdr (5/8/2017)

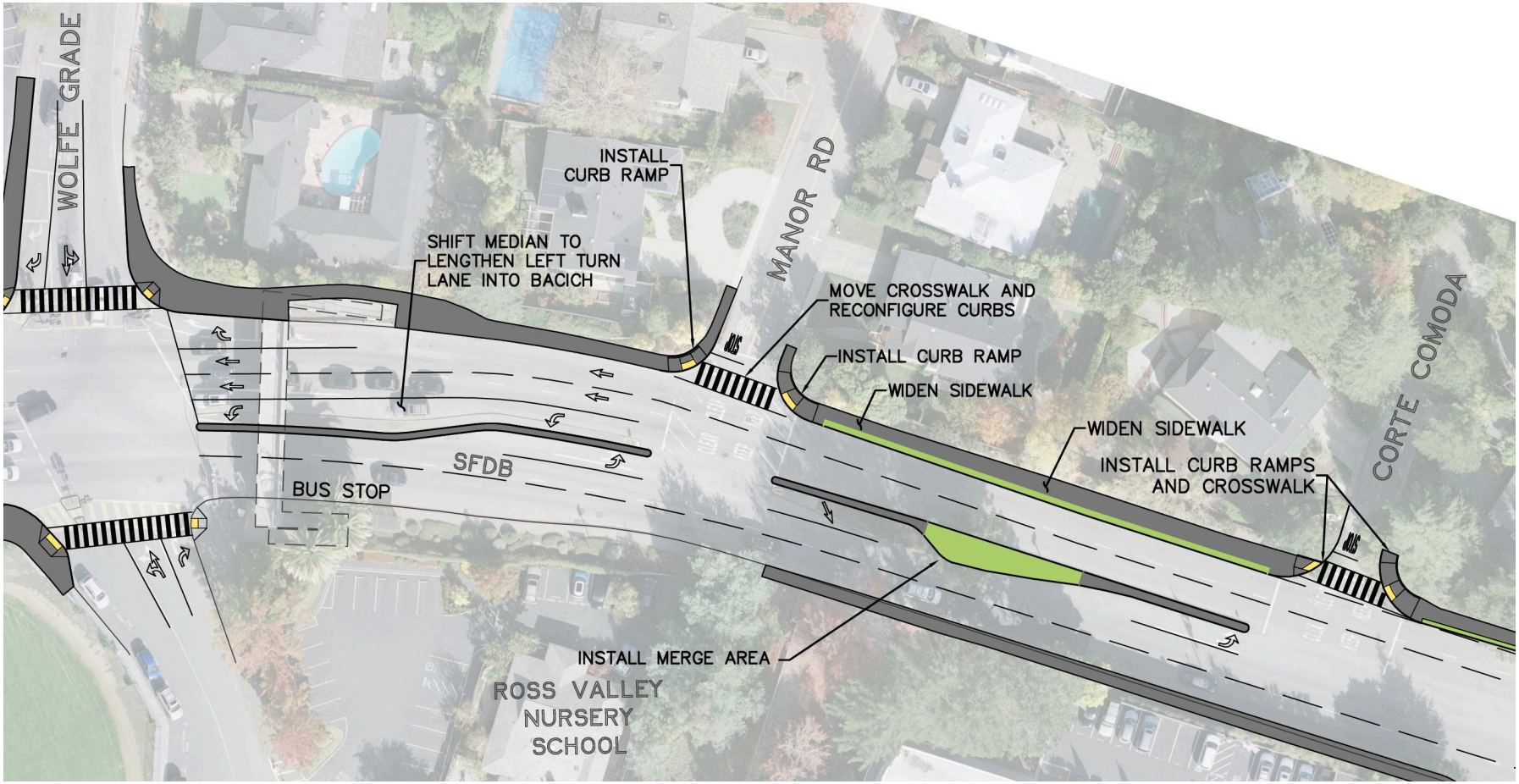

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FIGURE 3.22

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Manor Road Improvements

P:\BKF1501\g\EIR\Figure 3.22_Proposed Manor Road Improvements.cdr (5/8/2017)

Marin Catholic High School Frontage. The proposed project would provide continuous sidewalk along the south side of SFDB between Wolfe Grade and Bon Air Road. In addition, the driveway exit from Marin Catholic High School would be reconfigured to increase the visibility of pedestrians and to reduce the speed of exiting traffic. Figure 3.23 shows the proposed improvements to the Marin Catholic High School frontage.

3.5.3 Improving Access to Bicyclists and Pedestrians

In addition, the following improvements would be implemented to improve access for bicyclists and pedestrians.

Providing a shared use path along the north side of Sir Francis Drake Boulevard between Eliseo Drive and Bon Air Road. Along the north side of SFDB, the proposed project would install a concrete sidewalk with a minimum width of 8 feet. The project would remove the existing metal beam guardrail and replace it with a cable-type fence. To accommodate the new sidewalk, the existing median between El Portal Drive and Bon Air Road would be shifted to the south. Figure 3.24 shows the widened sidewalk on the north side of SFDB between Eliseo Drive and Bon Air Road. To provide additional width between Bon Air Road and Corte Comoda, the proposed project would remove the existing metal beam guardrail and replace it with a cable-type fence.

3.5.4 MMWD Water Pipeline

The County, on behalf of MMWD, proposes to replace a total of 8,000 feet of existing 12-inch cast iron and 14-inch steel potable water pipeline with 12-inch and 18-inch welded steel pipe as part of the proposed project. The existing cast iron pipe is near end-of-life condition.

To continue MMWD's effort to standardize pipe sizes within the District[8], eventually MMWD intends to replace an existing 14-inch-diameter pipe that crosses under Highway 101 north of SFDB with an 18-inch-diameter welded steel pipe. The purpose of increasing the pipe size is to install standard pipe sizes with appurtenance sizes (e.g., valves) that are standard to District warehouse stock for future maintenance, as well as to enhance the reliability of the water system. At this time to avoid future excavation within SFDB, the County proposes to install a section of the 18-inch-diameter pipeline along SFDB from Eliseo Drive to the Caltrans right-of-way at Highway 101 on behalf of MMWD.

Two segments of pipeline would be installed within SFDB:

- **Segment 1 – Ross Terrace to Manor Road along SFDB.** One segment of pipeline along SFDB would include parallel pipeline runs on either side of the roadway in order to shorten laterals to service locations and to avoid lateral runs that extend the full width of the roadway. In total, approximately 7,000 feet of new pipe would be installed as part of Segment 1. The existing 12-inch cast iron pipe would be replaced with 12-inch welded steel pipe. Figure 3.25 shows the MMWD water pipelines that would be replaced as part of Segment 1.

[8] MMWD uses standard sizes of 4-, 6-, 8-, 12-, 18-, 24-, and 36-inch pipe for its distribution and transmission system.

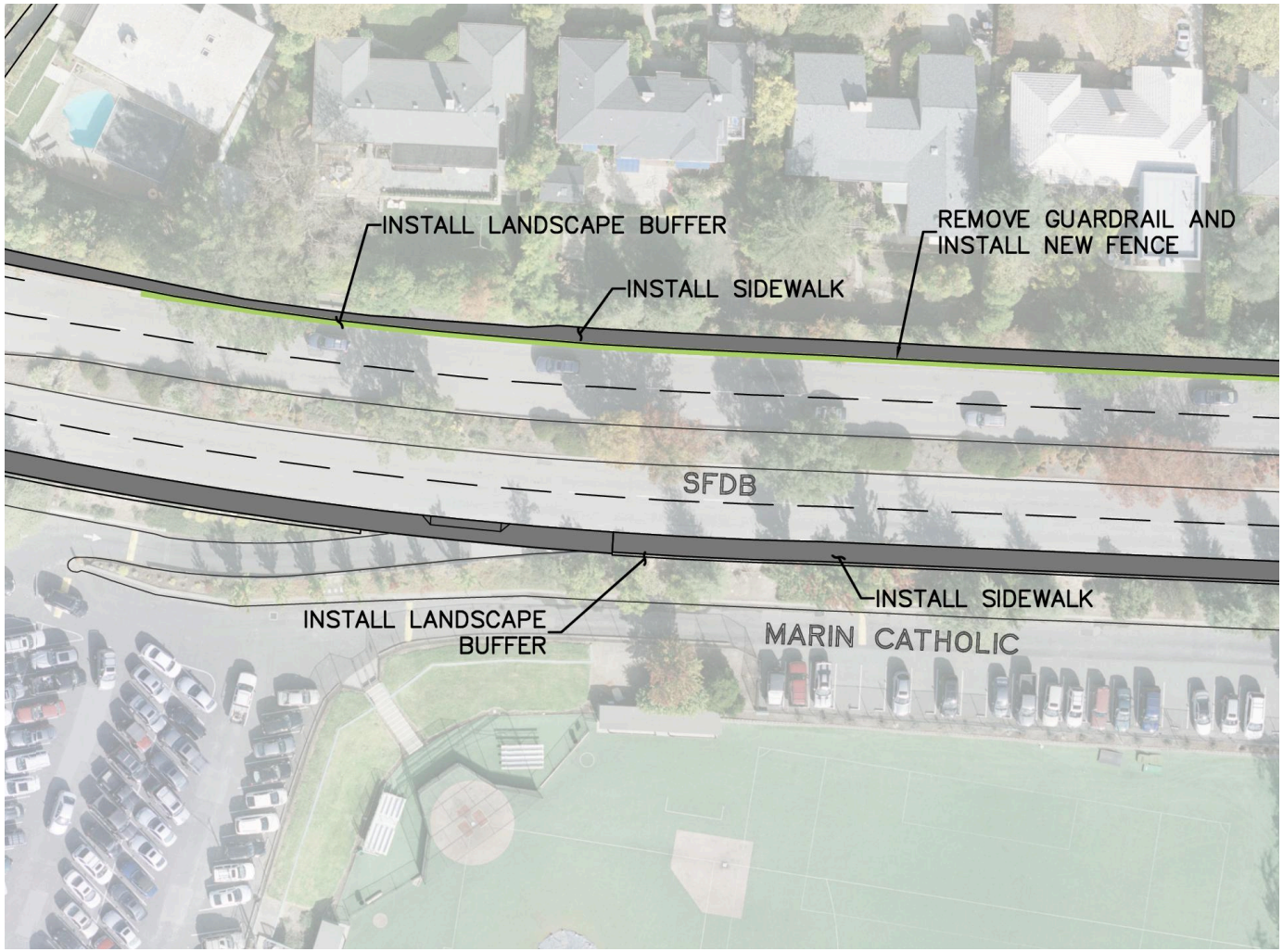

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FIGURE 3.23

FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Marin Catholic High School Frontage Improvements

P:\BKF1501\g\EIR\Figure 3.23_Proposed Marin Catholic High School Frontage Improvements.cdr (5/8/2017)

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FIGURE 3.24

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FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed Widened Sidewalk – North Side of SFDB between Eliseo and Bon Air Road

P:\BKF1501\g\EIR\Figure 3.25-A_Proposed Widened Sidewalk – North Side of SFDB between Eliseo and Bon Air Road.cdr (5/8/2017)

Segment 1: Ross Terrace to Manor Road

Replace pipeline with 7,000 feet of 12 inch WSP.

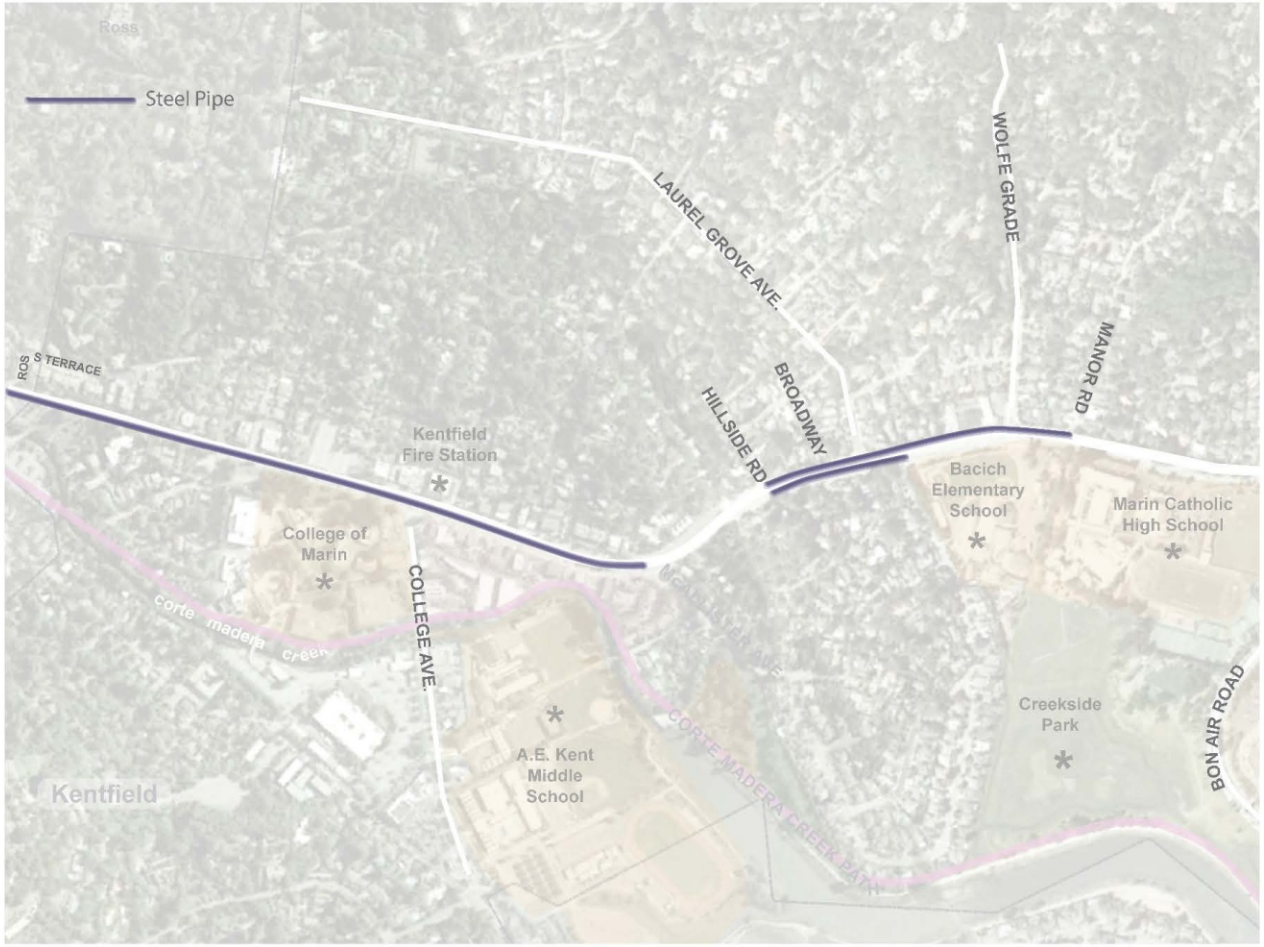

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FIGURE 3.25

FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed MMWD Pipeline Replacement – Segment 1

P:\BKF1501\g\EIR\Figure 3.26_Proposed MMWD Pipeline Replacement – Segment 1.cdr (6/22/2017)

- **Segment 2 – Barry Way to the west side of Caltrans' Highway 101 right-of-way along SFDB.** The project would install approximately 1,000 feet of pipeline for MMWD future use; the pipeline would be extended beyond the paving limits of SFDB to avoid future damage to the pavement when MMWD extends the pipeline. Figure 3.26 shows the MMWD water pipelines that would be replaced as part of Segment 2.

The existing cast iron pipe would be abandoned in place, and the new 12- and 18-inch welded steel pipe would be installed in a new trench, except where the existing and new pipes connect. Open trenching and trenchless methods would both be explored based on the connections and field conditions.

3.5.5 Storm Water Quality Features

With the reconfiguration of SFDB intersections at La Cuesta Drive and El Portal Drive, a large area within the right-of-way would become available to allow the opportunity for installing landscaping features. The proposed project could use a portion of the landscaping area to implement storm water quality facilities such as bioretention areas and pervious pavement. These features would remove pollutants and contaminants from storm water runoff prior to discharge to Corte Madera Creek. Bioretention areas would include 18 inches of an engineered soil that provides a high percolation rate, as well as a suitable soil matrix for landscape planting. Pervious pavement would consist of either asphalt, concrete, and/or pavers placed atop a permeable aggregate. These storm water quality features help the County comply with the Regional Water Quality Control Board's Stormwater Permit.

Representative photograph of a bioretention area

3.5.6 Construction Phasing and Schedule

The Department of Public Works (DPW) anticipates constructing the majority of the improvements to SFDB over a 2-year period provided that construction costs are consistent with available funding. Given the high volume of traffic, the work will require careful scheduling to reduce the potential for delays to users along the corridor. Work would occur from spring to fall. Work hours would generally be between 8:00 AM and 5:00 PM Monday to Saturday. However, when school is in session, work requiring lane closures would only be allowed between 8:30 AM and 5:00 PM Monday through Friday. For specific construction operations, DPW may conduct work during nighttime hours. Nighttime work hours are between 8:00 PM and 5:00 AM Sunday through Thursday.

Segment 2 Eliseo Dr to West of 101

Replace pipeline with 1,000 feet of 18 inch WSP.

LSA

FIGURE 3.26

FIGURE NOT TO SCALE

SOURCE: BKF Engineers, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Proposed MMWD Pipeline Replacement – Segment 2

P:\BKF1501\g\EIR\Figure 3.27_Proposed MMWD Pipeline Replacement – Segment 2.cdr (6/22/2017)

During the first year of construction, DPW plans to complete the following construction activities:

1. Installation of the MMWD pipeline commencing at Manor Road and working toward the Town of Ross. This work would include the following elements:

    a. Saw cutting and removal of pavement as well as trench excavation

    b. Installation of sand bedding at the bottom of the excavation

    c. Placement of welded steel pipe and associated appurtenances

    d. Backfilling of the pipeline trench

    e. Testing and disinfection of the new pipeline segments

    f. Excavation for and the installation of laterals to connect the new pipelines to existing services along SFDB

    g. Connection of the new pipe segments to the existing pipelines and plugging of the old segments to be abandoned

    h. Placement of final asphalt pavement over the trench

2. Simultaneously with the pipeline installation, the contractor would begin installation of the conduits and related infrastructure for the adaptive signal system working from Eliseo Drive to the west.

3. With completion of the conduits and infrastructure for a future adaptive signal system, the contractor would begin construction of the intersection improvements at Eliseo Drive as well as the modification to SFDB to accommodate the third lane. With completion of the Eliseo Drive intersection improvements, DPW would complete the intersection improvements at La Cuesta Drive. With the completion of the La Cuesta Drive intersection improvements, DPW would complete the intersection improvements at El Portal Drive.

4. With the completion of work at Eliseo Drive and La Cuesta Drive, DPW would complete the MMWD pipeline between Eliseo Drive and Highway 101 installed either by horizontal directional bore or the open trench method previously described.

5. The final improvement would be temporary striping of the third lane between El Portal Drive and Highway 101.

During the second year of construction, DPW would complete the following construction activities assuming adequate funds are available:

1. Complete the Bon Air Road intersection improvements, complete the SFDB median improvements east of Bon Air Road, and widen the sidewalk along Marin Catholic High School.

2. Complete the intersection improvements at West McAllister Avenue, Ash, and Elm Avenues.

3. Complete the intersection, median, and parking improvements at College Avenue.

4. When school is out of session, complete the intersection and sidewalk improvements at Laurel Grove Avenue, Bacich Elementary School frontage, Wolfe Grade, and Manor Road.

5. With all improvements complete, mill asphalt, complete pavement repairs, place asphalt, and install final striping along SFDB.

If funding is available, work would occur for a third year or beyond. In these years, DPW may complete some or all of the following construction activities:

1. Complete the multi-use trail working from Eliseo Drive to Bon Air Road including removal of the metal beam guardrail and replacing it with a cable fence. If DPW secures funding to complete this section of multi-use trail, it would defer the final paving of SFDB in the westbound lanes between Eliseo Drive and Bon Air Road until the trail is complete.

2. Construct the sidewalk on the south side of SFDB from Bon Air Road to El Portal Drive. If DPW secures funding to complete this section of multi-use trail, it would defer the final paving of SFDB in the westbound lanes between Bon Air Road and El Portal Drive until the trail is complete.

3. Widen the sidewalk between Bon Air Road and Manor Roads including improving the connection to the Rosey Path.

Implementation of a traffic control system to route motorists through the work zone along SFDB can reduce efficiency, thereby increasing construction costs. In an effort to reduce congestion, improve safety, and maximize DPW's investment in rehabilitating SFDB, DPW may allow the contractor to perform certain construction operations during the night. These operations would not include major demolition and would be limited to generating no more than 90 decibels measured at 50 feet from the source of noise. Construction operations to be performed by the contractor at night could include:

1. Asphalt milling

2. Placement of asphalt pavement

3. Placement of pavement stripes and markings

4. General excavation, grading, drilling/augering of holes for retaining walls or fence foundations, minor retaining walls, and backfilling

5. Trench excavation, placement of pipelines, and backfilling

6. Pipeline pressure testing and chlorination

7. Forming and pouring of concrete

8. Placement of conduits, pull boxes, and conductors

9. Installation of traffic signal poles, mast arms, signal controller and timing upgrades, and related appurtenances

3.6 REQUIRED PERMITS AND APPROVALS

The project would require local, State, and federal permits and approvals prior to construction. These are described below.

3.6.1 Approvals Required by the Lead Agency (County of Marin)

The proposed project requires the Certification of the EIR by the Marin County Board of Supervisors (the Board). The Board will vote on whether to certify the EIR before considering the merits of the project and making a decision to approve or deny the project or a project alternative. If the Board votes not to certify the EIR, then it cannot approve the project. The County will follow its normal notification and hearing processes for Board action. The Board will hold hearings on the EIR and the project merits. After certifying the EIR, the Board will make the final decision about whether to approve, conditionally approve, or deny the project.

3.6.2 Approvals Required from Other Agencies

Carrying out the project and developing the site may require approvals from the following agencies. These agencies could use this EIR or require further environmental review to make their decisions about the project and the permits they have the authority to grant.

- ***State of California Department of Transportation (CALTRANS)*** – has jurisdiction over portions of SFDB near the entrance ramps to Highway 101. The project will need to apply for an encroachment permit to complete work within this area.

- ***City of Larkspur*** – has jurisdiction over portions of Barry Road. The project will need to apply for an encroachment permit to complete work within this area.

- ***Regional Water Quality Control Board (RWQCB)*** – has jurisdiction over discharges affecting water quality. The RWQCB regulates discharges to waterways and wetlands through the adoption of Waste Discharge Requirements (WDR) and National Pollution Discharge Elimination System (NPDES) permits. Projects must comply with General Construction Activity Stormwater Permit requirements. The RWQCB may use the EIR to determine project consistency with the General Construction Permit requirements. The RWQCB issues the State certification for any required Corps permit. The RWQCB also has regulatory authority in connection with the CDFW's Streambed Alteration Agreement to grant Water Quality Certification (or Waiver) to cover any in-channel or wetland construction work related to the project.

- ***Bay Area Air Quality Management District (BAAQMD)*** – has jurisdiction over regional air quality issues. BAAQMD will review the EIR to ensure that the project is consistent with its regulations.

- ***California Department of Fish and Wildlife (CDFW)*** – has authority to oversee work done in streams pursuant to California Fish and Wildlife Code Sections 1601 and 1603. Project modification of permanent and seasonal drainages would require approval of a Streambed Alteration Agreement. Such an agreement would require that there be no net loss of wildlife habitat values or that lost acreage would be replaced. CDFW also has the authority to comment on Corps permits. Any waterway subject to CDFW jurisdiction is subject to Corps regulations. A Streambed Alteration Agreement would be a prerequisite for obtaining any Corps permit. The CDFW is also responsible for the protection of plant and wildlife populations and for overseeing the California Endangered Species Act. CDFW would require approval of a Mitigation Agreement and Mitigation Plan for plants listed as rare under the Native Plant Protection Act.

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4.0 ENVIRONMENTAL IMPACT ANALYSIS

This chapter contains an analysis of each potentially significant environmental issue identified in the NOP prepared for the proposed project and, as such, constitutes the major portion of the Draft EIR. Sections 4.1 through 4.12 of this chapter describe the environmental setting of the project as it relates to each specific issue, the impacts resulting from implementation of the project, and the mitigation measures that would avoid or reduce impacts of the project to a less-than-significant level.

Determination of Significance

Under CEQA, a significant effect is defined as a substantial, or potentially substantial, adverse change in the environment.[9] The *CEQA Guidelines*[10] direct that this determination be based on scientific and factual data. Each impact evaluation in this chapter is prefaced by criteria of significance, which are the thresholds for determining whether an impact is significant. These criteria of significance are derived from Appendix G of the *CEQA Guidelines*, the Marin County Environmental Impact Review Guidelines, and criteria expressed through the policies contained in the Marin CWP.

Issues Addressed in the Draft EIR

The following environmental issues are addressed in this chapter:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Global Climate Change
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning Policy
- Noise
- Public Services and Utilities
- Traffic and Circulation

It was determined that this project would not have a significant effect on population, employment and housing, and agricultural resources. As a result, these issues have not been investigated further in this chapter of the Draft EIR, but they are briefly addressed in Chapter 6.0, CEQA Required Assessment Conclusions, in the subsection Effects Found Not to Be Significant.

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9 Public Resources Code §21068.

10 California, State of, Governor's Office of Planning and Research. *California Environmental Quality Act Statutes and Guidelines.* 2016.

Format of Issue Sections

Each environmental issue section has four main subsections: (1) Setting; (2) Regulatory Framework; (3) Significance Criteria; and (4) Impacts and Mitigation Measures. Each impact and mitigation measure subsection is further subdivided into a discussion of the *less-than-significant* impacts and a subsequent discussion of *significant* impacts. Any identified significant impacts are numbered and shown in bold type, and the corresponding mitigation measures are numbered and indented. Significant impacts and mitigation measures are numbered consecutively within each topic and begin with a shorthand abbreviation for the impact section (e.g., LU for land use). The following symbols are used for individual topics:

AES: Aesthetics
AIR: Air Quality
BIO: Biological Resources
CULT: Cultural Resources
GEO: Geology and Soils
GCC: Global Climate Change
HAZ: Hazards and Hazardous Materials
HYD: Hydrology and Water Quality
LU: Land Use
NOI: Noise
PUB: Public Services
TR: Traffic and Circulation

The following notations are provided after each identified significant impact and after identification of mitigation measures:

SU: Significant and Unavoidable
S: Significant
LTS: Less than Significant

These notations indicate the significance of the impact before and after mitigation.

4.1 AESTHETICS/VISUAL RESOURCES

This section assesses the effects of the proposed project on the aesthetic and visual resources of the project area, including the visual impact of proposed roadway improvements on the existing visual character of the setting traversed by SFDB. The analysis also discusses the consistency of proposed project improvements with applicable visual resource related policies found in the November 2007 Marin CWP.

4.1.1 Setting

The evaluation of existing conditions for aesthetic resources requires the application of a process that objectively identifies the visual features, or resources of a landscape, assesses the character and quality of those resources relative to the overall visual character of the region, and describes the perspective of people to the visual resource landscape.

4.1.1.1 Visual Characteristics of the City-Centered Corridor

The City-Centered Corridor, along Highway 101 in the eastern part of Marin County near San Francisco and San Pablo bays, is designated for urban development and for protection of environmental resources. This corridor is divided into six planning areas that correspond with distinct watersheds. The project site is located within the Lower Ross Valley planning area, which includes lands south of Southern Heights and San Quentin Ridge, north of Corte Madera Ridge and east of Phoenix Lake. The Planning Area includes the City of Larkspur, the Town of Corte Madera, and the unincorporated communities of Kentfield, Greenbrae, San Quentin, and the Greenbrae Boardwalk. The bay waters, bordering the eastern boundary of the City-Centered Corridor, provide outstanding views, particularly from Highway 101.

4.1.1.2 Neighborhood Visual Character

Throughout Marin County, open space – particularly along hillsides and ridgelines – has played a major role in shaping urban form. The Corte Madera Ridge (also known as the North Ridge of Mill Valley) separates Larkspur from Mill Valley, while the Southern Heights Ridge separates Larkspur from San Rafael and extends eastward to form the San Quentin peninsula. The flat area between these ridges includes the urbanized areas of Larkspur and Corte Madera with the Lower Ross Valley extending and narrowing northwest into Kentfield and Ross. Greenbrae is built on the visible south-facing slope of the "Southern Heights Ridge." The San Francisco Bay opens out to the east.

SFDB is the east-west connection between West Marin, the Upper Ross Valley, Larkspur, San Quentin, and the East Bay. From the east in the Town of Ross, SFDB follows the base of the Southern Heights Ridge in Greenbrae and after passing north of Wood Island and the Ferry Terminal, follows the shoreline of the Corte Madera Channel before continuing northward over the ridge around San Quentin to the San Rafael-Richmond Bridge. North-south connectors such as College Avenue, Magnolia Avenue, Corte Madera Avenue, and Camino Alto follow the base of Ross Hill opposite the College of Marin and the base of King Mountain at Bon Air Road. Most of the area between these roads is flat land, water, and marsh, with the exception of Bon Air Road Hill, Wood Island, and Palm Hill. Corte Madera Creek flows through the valley floor.

At the western end of the project alignment in the Town of Ross, the streets are lined with tall, leafy trees, generally a mixture of exotic and native deciduous species, although evergreens, especially redwoods, are quite common as well. The combination of mountains, upland hills, valleys, valley floors, and trees creates a particularly scenic environment for Ross. The density of development is relatively low, especially in the hillside areas. As a result, the foliage-covered hillsides generally provide a scenic backdrop when seen from the valley floor or from a distance across the valley. [11]

At the eastern end of the project alignment near Highway 101, the entire hill from SFDB north to the top of the ridge is developed with single-family ranch houses. Major entrances to this neighborhood are identified by lighted pillars and signs, and well-planted medians divide the streets, many of which are split-level. The landscaping in this area is mature. Multi-family housing is located on the south side of SFDB, from Marin Hospital to the Bon Air Shopping Center. From a distance, these light-colored buildings look like long horizontal "dashes" on the darker hill. The Bon Air Shopping Center and Drake's Landing Office Center are the major commercial developments along the project alignment. A small commercial area, with a mix of offices and retail uses, lies just west of the Bon Air Shopping Center on SFDB.

4.1.1.3 Scenic Resources

Highway 101 in the project corridor is not designated as a State scenic highway. However, the Marin Countywide Plan identifies Highway 101 through Marin County as a scenic corridor. Further, the Countywide Plan includes policies to protect scenic resources, including ridgelines and hillsides, as well as to create attractive and functional streets and parking areas.

As described in Section 4.3, Biological Resources, the Marin County Native Tree Protection and Preservation Ordinance[12] limits the removal of County-designated "protected" and "heritage" trees, as defined in Table 4.1.A. Removal of any protected or heritage trees requires that a tree removal permit be obtained, except where the health of the tree is poor, the tree is infected by a pathogen or insect, the tree is a potential public health and safety hazard, nuisance, or fire hazard, or any of the other exemptions identified in Section 22.62.040 of the Marin County Code apply.

In addition, Section 12.16 of the City of Larkspur Municipal Code[13]restricts and regulates the removal and/or excessive pruning of mature or "heritage" trees. The City defines a "heritage tree" as either of the following: (1) a live tree or grove of live trees of historical significance specifically designated by official action of the City Council; or (2) any live tree which has a trunk with a

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[11] WRA Environmental Consultants, 2014. Upper Road Land Division Draft Subsequent Environmental Impact Report. April. Available online at: http://www.townofross.org/documentsandforms?field_microsite_tid=21 (Accessed July 16, 2017)

[12] Marin County, 2017. Marin County Code Chapter 22.27, Native Tree Protection and Preservation. Available online at: https://library.municode.com/ca/marin_county/codes/code_of_ordinances?nodeId=MARIN_CO_CALIFORNIAMUCO (Accessed on July 16 ,2017)

[13] City of Larkspur, 2017. City of Larkspur Municipal Code, Section 12.16, Trees, Including Heritage Trees. Available online at: http://www.codepublishing.com/CA/Larkspur/?Larkspur18/Larkspur1816.html. (Accessed on July 16, 2017).

circumference of fifty inches or more, measured at 24 inches above the natural grade, or at a point 24 inches above the highest grade.

Table 4.1.A: Marin County Protected and Heritage Trees

Common Name	Botanical Name	Protected Size – Diameter at Breast Height	Heritage Size – Diameter at Breast Height
Arroyo willow	S. lasiolepis	6 inches	18 inches
Big-leaf maple	Acer macrophyllum	10 inches	30 inches
Bishop pine	Pinus muricata	10 inches	30 inches
Blue oak	Q. douglasii	6 inches	18 inches
Box elder	A. negundo var. californicum	10 inches	30 inches
California bay	Umbellularia californica	10 inches	30 inches
California black oak	Q. kelloggii	6 inches	18 inches
California buckeye	Aesculus californica	10 inches	30 inches
California nutmeg	Torreya californica	10 inches	30 inches
Canyon live oak	Q. chrysolepis	6 inches	18 inches
Chaparral oak	Q. wislizeni	6 inches	18 inches
Coast live oak	Quercus agrifolia	6 inches	18 inches
Coast redwood	Sequoia sempervirens	10 inches	30 inches
Douglas-fir	Pseudotsuga menziesii	10 inches	30 inches
Giant Chinquapin	Castanopsis chrysophylla	10 inches	30 inches
Hawthorn	Crataegus douglasii	10 inches	30 inches
Mountain-mahogany	Cercocarpus betuloides	10 inches	30 inches
Narrow leaved willow	Salix exigua	6 inches	18 inches
Oak	Q. parvula var. shrevei	6 inches	18 inches
Oregon ash	Fraxinus latifolia	10 inches	30 inches
Oregon oak	Q. garryana	6 inches	18 inches
Pacific madrone	Arbutus menziesii	6 inches	18 inches
Pacific yew	Taxus brevifolia	10 inches	30 inches
Red alder	A. rubra	10 inches	30 inches
Red elderberry	Sambucus callicarpa	10 inches	30 inches
Red willow	S. laevigata	6 inches	18 inches
Sargent cypress	Cupressus sargentii	6 inches	18 inches
Scoulier's willow	S. scouleriana	6 inches	18 inches
Service-berry	Amelanchier alnifolia	10 inches	30 inches
Shining willow	S. lucida ssp. lasiandra	6 inches	18 inches
Silk tassel	Garrya elliptica	10 inches	30 inches
Sitka willow	S. sitchensis	6 inches	18 inches
Tanbark oak	Lithocarpus densiflorus	10 inches	30 inches
Valley oak	Q. lobata	6 inches	18 inches
Wax myrtle	Myrica californica	10 inches	30 inches
White alder	Alnus rhombifolia	10 inches	30 inches

Source: Marin County Code 2017

4.1.1.4 Views of the Roadway

Other viewers in the project area consist of all those who can see the roadway project alignment or any of its components from offsite locations, including adjacent development and local roadways on either side of SFDB. Drivers, bicyclists, and pedestrians using local streets each day have short

duration views of the project area. Other than from adjacent roadways and Highway 101, direct open views of the site are generally unavailable.

4.1.1.5 Views from the Roadway

Views of the project area are experienced by those who travel along the roadway. The majority of views are from moving vehicles and bicyclists. Pedestrians who might have more time to view the roadway are not easily accommodated along the roadway due to the narrow paved width of the road and topographic conditions that for the most part prohibit continuous pedestrian movement adjacent to the roadway within the project area. Trees, vegetation, varied topography, and the curvilinear alignment of SFDB limit and focus views to either side of the roadway and a short distance ahead.

This section of SFDB is located in the highly developed area of Marin County. Overall the dominant visual character of the project area consists of urban uses, including residential and commercial development, and public facilities. The visual and aesthetic character of SFDB from Highway 101 in the east to the Town of Ross to the west is largely uniform with minor variations in the visual experience an observer encounters along the roadway depending on the density of development, the extent of landscaping, and the width of the roadway.

- **Eastern Segment.** The eastern segment near the Bon Air Shopping Center has the highest motor vehicle traffic volume. Traveling along SFDB from east to west, the observer can see the houses of Greenbrae to the right and above with the offices of Drake's Landing and the Bon Air Shopping Center on the left. The visual experience from the roadway is one of increasing traffic congestion. Traveling west from the Richmond-San Rafael Bridge, the driver has traveled from the open road of the bridge, past the increasingly dense development associated with San Quentin Prison, Larkspur Landing, and the Ferry Terminal and into the City of Larkspur. The observer encounters commercial development associated with the Bon Air Shopping Center with associated street trees and ornamental landscaping on the left. To the right, hillsides with trees and shrubs, as well as residential landscaping, are in view. A landscaped median is present in this roadway segment. In addition, street lights and utility poles (and lines) are prominent along the roadway edge and Mount Tamalpais is visible in the far distance.

- **Central Segment.** The central segment of SFDB between College Avenue and El Portal Drive consists of four lanes with right and left turn pockets and sidewalks, and includes on-street parking west of Wolfe Grade. Small businesses, multifamily housing, and the College of Marin front this segment, as well as, two schools, Bacich Elementary School and Marin Catholic High School. This stretch includes a very constrained section of right-of-way due to steep topography between Bon Air Road and El Portal Drive that includes retaining walls and no median. These conditions (e.g., steep topography, retaining walls) combined with mature trees and fairly dense vegetation, create a narrow visual experience for the observer with limited views beyond the roadway until just before Bon Air Road. At Bon Air Road, views open up to the south and west from the roadway with Mount Tamalpais prominent in the distance and residential development visible on the nearby ridgelines. Foreground views include public facilities associated with Bacich Elementary School and Marin Catholic High School, landscaping associated with adjacent residential development that backs onto the roadway and roadway

infrastructure. After Wolfe Grade, the topography flattens out and the character of the roadway becomes suburban in nature with views of residential development and mature landscaping until the observer approaches the College of Marin.

- **Western Segment.** The western segment near the Town of Ross has the lowest traffic volumes and generally includes the narrowest roadway cross-section, with three vehicle lanes and sidewalks, fronted by multifamily housing and the College of Marin. According to the Town of Ross General Plan, the Town of Ross is a quiet residential community with tree-lined, shady streets. The combination of mountains, upland hills, valleys, valley floors, and mature trees creates a scenic environment for the Town of Ross.

4.1.1.6 Light and Glare Conditions

The project site is located in an urban area with a nighttime ambient light environment consisting of artificial lighting. Lighting sources on the project site and in the surrounding area include interior and exterior building lighting, security/courtesy lighting for parking areas, vehicle headlights, and street lighting. Daytime sources of glare on the project site and in the surrounding area include reflections from light-colored surfaces, windows, and metal details on cars traveling on nearby roadways.

4.1.2 Regulatory Framework

The Marin CWP, the Marin County Code, and the California State Scenic Highway Program include the following policies relevant to the visual resources of the project area.

4.1.2.1 State Regulations

California State Scenic Highway Program. California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. A highway may be designated as "scenic" based on the expanse of the natural landscape that can be seen by travelers, the scenic quality of that landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. A Scenic Corridor is described as the land generally adjacent to and visible from such a highway and is usually limited by topography and/or jurisdictional boundaries. In addition to State Highways, County roads are also eligible for scenic designation.

No designated State Scenic Highways are located within Marin County, although roadways throughout Marin, especially in the rural area of Western Marin, offer views of the County's scenic resources. Two segments of Highway 101 in Marin County are eligible for inclusion on the list of State Scenic Highways: the segment opposite San Francisco/State Route 1 in Marin City and the segment near State Route 37/Ignacio in Novato.

4.1.2.2 Marin County

Marin Countywide Plan. The Marin Countywide Plan serves as the comprehensive guide for making decisions about road improvements, protection of natural resources, and public health and safety. Goals and policies within the Marin Countywide Plan emphasize the value of preserving scenic views

and visual resources in Marin County. Policies relevant to the visual character or aesthetics of the proposed project include:

Goal DES-1: Preservation of Community Character. Perpetuate the unique character of each community, including the essential design characteristics that make it attractive and livable.

Goal DES-4: Protection of Scenic Resources. Minimize visual impacts of development and preserve vistas of important natural features.

Policy DES-4.1: Preserve Visual Quality. Protect scenic quality and views of the natural environment — including ridgelines and upland greenbelts, hillsides, water, and trees — from adverse impacts related to development.

> *Program DES-4.b: Minimize Visual Impacts of Public Facilities.* Amend applicable codes and procedures to require appropriate placement, design, setbacks, and native landscaping of public facilities (including sound-walls, medians, retaining walls, power lines, and water tanks) to reduce visual impacts, and encourage local agencies to adopt similar standards.

Goal DES-5: Attractive and Functional Streets and Parking Areas. Design automobile use areas to fit the character of the community, and comfortably accommodate travel by pedestrians and bicyclists, while still meeting health, safety, and emergency access needs.

Policy DES-5.1: Achieve Streetscape Compatibility. Ensure that roadways, parking areas, and pedestrian and bike movement are functionally and aesthetically appropriate to the areas they serve.

Goal TR-1: Safe and Efficient Movement of People and Goods. Provide a range of transportation options that meet the needs of residents, businesses, and travelers.

Goal TR-41: Protection of Environmental Resources. Minimize environmental disruption and energy use related to transportation

Policy TR-4.1: Minimize Disturbance and Condemnation. Limit environmental disruption and condemnation of land due to transportation projects.

Marin County Development Code. The broad purposes of the Marin Development Code are to protect and promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents and businesses in Marin County and to implement the policies of the Marin Countywide Plan.

Chapter 22.27 establishes regulations to preserve and protect native trees by limiting tree removal while allowing reasonable use and enjoyment of the property. Although the intent is to preserve and protect native trees, the chapter clarifies that it does not confer an obligation by the County to protect view-sheds. The intent of the chapter is to control the removal of protected trees and to maintain and enhance tree cover; to prevent the unpermitted wholesale removal of native trees

prior to an application for development; to protect woodland environments on agricultural land; and to educate residents of the County about the functions, benefits, and values of trees.

Protected trees may be removed in specific circumstances as clarified in Section 22.27.040 *Exemptions to the Prohibition on Removal of a Protected Tree* without obtaining a permit. These exemptions include the following which is applicable to the proposed project:

> *K. The tree removal is by a public agency to provide for the routine management and maintenance of public land or to construct a fuel break.*

Some of the trees within and adjacent to the public right-of-way within this section of SFDB meet the definition of "protected" and/or "heritage" trees. However, given that the project is being initiated by a public agency "for the routine management and maintenance" of a public roadway, the proposed project, in accordance with Section 22.27.040 (k) of the County Code, would not trigger the requirement for a permit.

4.1.2.3 City of Larkspur

City of Larkspur General Plan. The City of Larkspur General Plan provides the development policies for the City and its Sphere of Influence. The General Plan is the official policy guide for governmental decision-makers within and outside of Larkspur and is a reference for Larkspur citizens who want to know what is planned for their city and for property owners who want to know the potential use of their land. Policies relevant to the visual character or aesthetics of the proposed project include:

<u>Community Character Element</u>

Goal 2: Maintain Larkspur's livable and attractive environment.

Policy b: Preserve the desirable features of the built environment as well as the remaining natural environment - trees, marshes, creeks, hillsides - as components of Larkspur's community character and identity.

Policy d: Visually integrate the various sections of the community.

<u>Circulation Element</u>

Goal 1: Regard quality of life in Larkspur as more important than mobility of traffic.

Goal 2: Provide safe and efficient local-serving transportation facilities and services for the movement of people and goods.

Policy h: Design circulation facilities that minimize disruption of neighborhoods and communities.

Policy m: SFDB shall not be widened to allow additional through-traffic lanes.

Action Program [2]: Actively cooperate with the County of Marin to seek workable capacity improvements to SFDB that are not disruptive to the community.

Action Program [3]: Maintain and improve the existing median strip landscaping on SFDB.

Action Program [5]: Perform the following specific capacity and safety related improvements:

- *Signalize the intersection of SFDB with Larkspur Landing Circle (east).*
- *Remove the railroad trestle from the roadway of SFDB, east of Highway 101.*
- *Make capacity enhancing improvements on east SFDB between Larkspur Landing Circle (west) and Highway 101.*
- *Add a southbound-to-eastbound left-turn lane on Eliseo Drive at the intersection with SFDB.*
- *Signalize the intersection of Redwood Highway and Industrial Way, and add a northbound left-turn lane.*
- *Signalize the intersection of SFDB with El Portal Drive.*

Goal 5: Encourage attractive alternatives to the use of single-occupant automobiles.

Goal 16: Circulation improvements should not adversely affect the environment.

Policy ag: Ensure that transportation facilities do not impinge upon irreplaceable resources (such as Corte Madera Creek, the Bay and its shoreline, important open space lands, and recreational facilities).

Action Program [21]: Landscape new circulation facilities in harmony with the environment and safety considerations.

<u>Environmental Resources Element</u>

Goal 1: Preserve and enhance a variety of open space features including ridgelines, the wetlands along the Bay and the creeks, wildlife habitats, view corridors, and other amenities which contribute to a sense of openness in Larkspur.

Action Program [7]: If a development proposal requires the removal of trees or other vegetation of significant resource value or adversely impacts a wetlands area (as defined in implementing ordinances), require the developer to replace the lost resources.

City of Larkspur Municipal Code. The purpose of Chapter 12.16 Trees, Including Heritage Trees, of the City of Larkspur Municipal Code is to protect the City's native trees, such as redwood, oak, and madrone by restricting and regulating the removal and/or excessive pruning of mature or "heritage"

trees. According to Section 12.16.010, a "heritage tree" means either of the following: (1) a live tree or grove of live trees of historical significance specifically designated by official action of the City Council; or (2) any live tree which has a trunk with a circumference of fifty inches or more, measured at twenty-four inches above the natural grade, or at a point twenty-four inches above the highest grade.[14] Removal or pruning (beyond the "best practices" pruning guidelines of the International Society of Arboriculture or the American National Standards Institute) requires a permit from the City of Larkspur City Manager or Planning Department. The City of Larkspur Planning Commission may require replacement trees in a reasonable number depending on the type and size of the tree(s) removed and the recommendations of a qualified arborist.

Kentfield/Greenbrae Community Plan. The study area for the Kentfield/Greenbrae Community Plan, adopted in 1987, includes the unincorporated area of Marin County bordered by the Town of Ross and the cities of San Rafael, Larkspur, and Mill Valley. The intent of the Kentfield/Greenbrae Community Plan is to protect those qualities of the community that enhance it as a predominantly single-family residential area and to limit multi-family and commercial development to the historic Kentfield area. Goals and policies relevant to the visual resources and aesthetics of the proposed project include:

Goal 1: Achieve high quality in the natural and built environment through a balanced system of land use, transportation and open space.

Goal 4: Encourage land use modifications, circulation improvements, and community organizations which further a sense of neighborhood and community identity.

Goal 7: Limit changes in land use and circulation to those which do not: 1) generate substantial additional traffic; 2) conflict with and congest intra-community travel; and 3) endanger pedestrian and bicycle movement.

4.1.3 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on visual resources if it would:

- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

[14] The measurement producing the greatest circumference shall be used. In the case of multi-trunk trees, the circumference of each trunk is to be measured in the manner previously described, and the circumference of each trunk is to be added to ascertain the total circumference of the tree.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to visual quality if it would:

- Conflict with County goals and policies related to visual quality.
- Significantly alter the existing natural view sheds, including changes in natural terrain or vegetation.
- Significantly change the existing visual quality of the region or eliminate significant visual resources.
- Significantly increase light and glare in the project vicinity.
- Significantly reduce sunlight or introduce shadows in areas used extensively by the public.

4.1.4 Impacts and Mitigation Measures

This section discusses potential impacts to the visual quality of the project site and vicinity that could result from the implementation of the proposed project. The section describes the visual components of the proposed project including an assessment of the potential change, if any, to the existing visual character of the project area. Impacts associated with the proposed project are identified, as well as mitigation measures, if appropriate.

(1) Scenic Vista/Existing Viewshed. The project area is most visible to motorists and cyclists traveling along SFDB. Limited scenic vistas are possible along the project corridor due to the relatively flat topography and the surrounding urban development. Visible elements of the proposed project would include the roadway reconstruction, intersection modifications, proposed pedestrian safety improvements (e.g., sidewalks, rapid flashing beacons, high visibility crosswalks), and stormwater quality facilities, such as bioretention areas and pervious pavement. In addition, as part of the bicycle and pedestrian access improvements, the project would remove the existing metal beam guardrail and replace it with a cable-type fence. The majority of these project elements would be at-grade or low-level and are not expected to impair surrounding views. Proposed retaining walls would replace and/or extend the existing retaining walls that support the slopes adjacent to the roadway; these walls would not block scenic vistas or otherwise affect the surrounding viewshed.

Implementation of the proposed project would require some excavation and grading for roadway rehabilitation and pipeline replacement. However, these activities would not result in a change in elevation and the existing topography of the project site would be maintained. Implementation of the proposed project would require removal of some trees and vegetation adjacent to the roadway in order to accommodate proposed improvements. As described in Section 4.3, Biological Resources, some of the trees to be removed may be defined as “protected” and/or “heritage” trees by either Marin County or the City of Larkspur. As outlined in the project description, up to 10 trees would be removed to accommodate proposed improvements at the College Avenue intersection and along the Bacich Elementary School frontage. However, these activities would not result in

substantial adverse impacts to scenic views available from SFDB, given the limited extent of tree removal. Therefore, the impact of the project on scenic vistas would be less than significant.

(2) Scenic Resources along a State Scenic Highway. According to the California Department of Transportation (Caltrans), no officially designated state scenic highways are located in the vicinity of the project site. The proposed project is not within view from any designated State Scenic Highway and would not affect scenic resources along a State Scenic Highway. Therefore, the proposed project would have a less-than-significant impact on scenic resources along a State Scenic Highway.

(3) Existing Visual Character or Quality. The project's effect on the visual character of the site and vicinity is evaluated below.

Temporary Impacts (Construction). Construction activities often contrast with and disrupt the general order and existing aesthetic character of a given location or area; however, such impacts are considered temporary and no longer exist upon completion of construction and the maturation of landscaping at a project site. The total duration of construction would occur over a 2-year period, with work occurring during the seven months of the dry season (April 1 through October 31) for each of those 2 years. If funding is available, work would occur for a third year or beyond.

Although temporary in nature and common for most construction sites, construction activities associated with the project could have the potential to give the project site a visually unappealing quality during certain phases of the construction. On-site excavation and construction activities would be visible to adjacent land uses, particularly travelers along SFDB and adjacent roadways and adjacent land uses. Temporary fencing would be placed during construction to screen demolition and construction activities from the street level. As a result, views of most demolition and construction activities would be largely blocked by perimeter fencing.

As described above, construction of the project would require the removal of some trees and vegetation along the roadway alignment. Due to the limited extent of tree removal and the existing landscaping along the project corridor, the effects of tree removal would create a recognizable change in the appearance of the site but would not significantly degrade the existing scenic quality or character of the project site.

Construction-related effects to views of the site would not be out of character with the existing urban landscape surrounding the site and would be temporary. Therefore, since impacts during construction activities would be temporary and would cease upon completion of construction, the project would not substantially alter the character of views for off-site viewers. For these reasons, construction activities would not substantially degrade the existing visual character and quality of the site and its surroundings, and no mitigation is required.

Permanent Impacts (Operation). The project site is located in a developed and urbanized area consisting of a mix of commercial (including retail and office uses), residential, and public uses (e.g., schools). The project site consists of an existing roadway with associated roadway infrastructure including curb and gutter, signals, roadway striping, and sidewalks. Mature landscaping occurs along the roadway in some locations. The proposed project includes three classes of improvements that

would modify the existing engineering features, design characteristics, and setting of the roadway. These classes are: (1) pavement rehabilitation; (2) intersection/roadway adjustments; and (3) guardrail replacement, retaining wall installation/extension, and other roadway infrastructure. Each class would require some degree of alteration of the existing roadway or roadway features to accommodate a design or construction feature. These alterations would modify the existing physical characteristics and form of SFDB that contribute to its visual character. Each class of alterations and the potential for impacts from these modifications are discussed below.

Pavement Rehabilitation. The project would repair damaged pavement, mill the surface, and place an asphalt overlay on the roadway between Ross and Highway 101. In conjunction with the asphalt repair, the project would update curb ramps at intersections to comply with the ADA. Proposed pavement rehabilitation would alter portions of the original roadway but would not modify the visual appearance of the roadway with the exception of the roadway looking new rather than old and dilapidated and the addition of new curb ramps. Accordingly, the visual impact to the appearance of the roadway is deemed less than significant.

Intersection/Roadway Adjustments. The proposed project would relieve congestion along SFDB by adding a third lane eastbound from El Portal Drive to Highway 101, modifying several intersections to allow for simultaneous left turn movements, and adding a second left turn lane at College Avenue. These adjustments would result in an alteration to the roadway's design, including creating standard intersection right turn lanes, modifying the lane configurations, and shifting the roadway median in some locations. However, the alterations would be localized and would occur within the existing roadway corridor, and the finished roadway would be visually similar to the existing roadway. The alterations would be slight adjustments and would not diminish the design or aesthetic characteristics of the roadway. Accordingly the visual impacts of the intersection and roadway adjustments are deemed less than significant.

Guardrail Replacement, Retaining Wall Installation/Extension, and Other Roadway Infrastructure. As part of the proposed project, the metal beam guardrail would be removed and a new cable fence would be installed from Eliseo Drive to Wolfe Grade. The proposed new cable fence would introduce a modern structure that will improve the roadway's integrity of design, workmanship, and materials and improve the visual quality of the project alignment.

The proposed project would construct segments of retaining wall on portions of SFDB to facilitate proposed improvements. Low retaining wall segments would be used to increase the sidewalk width without extending the grading limits. The low retaining walls of no more than 3 feet in height would be installed between El Portal Drive and Bon Air Road, where no existing walls exist. The existing retaining walls along this segment of SFDB would remain in place. The low retaining walls would be constructed from either concrete or wood planking. Proposed retaining walls would be visually consistent with the existing retaining walls along the project corridor. Therefore, the retaining walls would not substantially diminish the visual character of the roadway.

The project would install new traffic signal controllers as well as poles, mast arms, and signal faces in all signalized intersections between College Avenue and Eliseo Drive using the latest technology available. In addition, the proposed project would install pedestrian and bicycle improvements, including widened sidewalks, a relocated transit stop, and rectangular rapid flashing beacons or a

HAWK-type beacon and a high visibility crosswalk at the Ash Avenue intersection. These proposed improvements would be visible along the roadway; however, they would be consistent with existing roadway infrastructure in the project area and in other developed areas in Marin County. Therefore, the construction of proposed roadway infrastructure would result in a less-than-significant impact to the visual character of SFDB.

Improvements proposed as part of the proposed project would be generally consistent with the visual landscape of the area and would not result in a substantial or adverse change to the visual quality or character of the site and surroundings.

(4) Reduction in Sunlight or Introduction of Shadows in Areas Used by the Public. Implementation of the proposed project, including repaving the surface, modifying intersection operations, and implementing pedestrian and bicycle improvements, would not significantly reduce sunlight or introduce a substantial amount of new shadowing in public access areas adjacent to the project area, such as College of Marin, Bacich Elementary School, and Marin Catholic High School. The removal of trees and other vegetation to accommodate these changes would not reduce sunlight or introduce shadows in areas used by the public due to the number of trees that would remain and the urban character of the project site. Therefore, reduction in sunlight and shadow impacts of the project are considered less than significant.

(5) New Source of Light and Glare. The potential impacts of lighting and glare from the project are discussed below.

Temporary Impacts (Construction). Most of the construction activities would occur during the daytime in compliance with Marin County requirements. However, some nighttime construction would be required.

Impact VIS-1: Nighttime construction for the proposed project would create a new source of light affecting nighttime views for adjacent residences. (S)

Lighting required during the construction period could generate light spillover in the vicinity of the project site. “Spill light” is defined as light that trespasses or spills out of the intended area and illuminates adjacent property, and is generally considered unwanted. Although proposed lighting would be generally consistent with and similar to existing lighting along the project corridor, this lighting could increase levels of nighttime light in the area, particularly for the residential areas adjacent to the project corridor.

“Glare” refers to the sensation experienced looking into an excessively bright light source that causes a reduction in the ability to see or causes discomfort. Daytime glare can result from natural sunlight reflecting from a shiny surface that would interfere with the performance of an off-site activity, such as the operation of a motor vehicle. Construction activities are not anticipated to result in flat, shiny surfaces that would reflect sunlight or cause other natural glare. Minor glare from sunlight on construction equipment and vehicle windshields is not anticipated to impact visibility in the area as the construction site would largely be shielded from pedestrian and motorist views. As described above, construction vehicles would be operating at night for some portions of project construction, and thus could create nighttime sources of glare.

Implementation of the following mitigation measure would reduce this impact to a less-than-significant level:

> Mitigation Measure VIS-1: Contract specifications shall require that flood lighting be placed in a manner such that the light will be cast downward and confined to the immediate work area. In addition, lights will be shielded to prevent stray light. County staff may require photometric analysis if necessary to properly evaluate the proposed lighting. (LTS)

Significance After Mitigation. Implementation of Mitigation Measure VIS-1 would reduce potential impacts due to glare generation to less than significant during construction.

Permanent Impacts (Operation). Existing nighttime lighting at the project site and in the surrounding area would include interior and exterior building lighting, security/courtesy lighting for parking areas, vehicle headlights, and street lighting. The proposed project would entail improvements on the existing roadway; therefore, it would not generate more light along the project corridor than occurs under existing conditions. No new light standards and limited light fixtures (e.g., replacement signals, flashing crosswalk beacons) are proposed. These fixtures would be consistent with existing roadway infrastructure along the project corridor and would not result in a new source of light that would adversely affect nighttime views in the area. No new light sources are proposed, no substantial nighttime views exist in the immediate vicinity, and existing commercial lighting and vehicle light in the project area is already substantial. Therefore, the proposed project would not result in light impacts, and no mitigation is required.

The proposed project would not construct any new shiny surfaces, such as window glass or polished surfaces that would create daytime glare. While some of the proposed improvements would include metal surfaces, such surfaces would be consistent with existing roadway infrastructure along the project corridor and the reflection toward oncoming motorists from such surfaces would be minimal.

Nighttime glare-sensitive uses include vehicles traveling along the roadway. No nighttime glare-producing facilities are proposed as part of the project. The nighttime glare associated with the proposed project would be the same as the nighttime glare under the existing condition. Therefore, impacts due to glare would be less than significant during operation of the project. No mitigation is required.

(6) Conflict with County Goals and Policies. Most aspects of the proposed project, including repaving the surface, reconfiguring the roadway, and installing roadway improvements, would not significantly affect the visual character or scenic quality of the roadway and its surrounding area and therefore would not conflict with County goals and policies related to visual quality (see Section 4.2.2, Regulatory Framework, above). Tree removal and installation of proposed improvements change the visual experience for those familiar with traveling the roadway but would not alter the visual character of the roadway or the project area. Therefore, the project is consistent with various policies intended to ensure that future projects are sensitive to the surrounding visual context, including preservation of scenic quality and views of the natural environment. The project would have a less-than-significant impact in relation to consistency with these specific County policies.

4.2 AIR QUALITY

This section has been prepared using methodologies and assumptions recommended in the air quality impact assessment guidelines of the BAAQMD.[15] In keeping with these guidelines, this section describes existing air quality, impacts of the project on local carbon monoxide (CO) levels, impacts of vehicular emissions that have regional effects, and exposure of sensitive receptors to toxic air contaminants (TACs). Mitigation measures to reduce or eliminate potentially significant air quality impacts are identified, where appropriate. Air quality modeling results are included in Appendix E.

4.2.1 Setting

The following discussion provides an overview of existing air quality conditions in the region and Marin County. Ambient air quality standards and the regulatory framework are summarized, and climate, air quality conditions, and typical air pollutant types and sources are also described.

4.2.1.1 Air Pollutants and Health Effects

Both State and federal governments have established health-based Ambient Air Quality Standards (AAQS) for six criteria air pollutants:[16] carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Two criteria pollutants, O_3 and NO_2, are considered regional pollutants because they (or their precursors) affect air quality on a regional scale. Pollutants such as CO, SO_2, and Pb are considered local pollutants that tend to accumulate in the air locally.

The primary pollutants of concern in the project area are O_3, CO, and PM. Significance thresholds established by an air district are used to manage total regional and local emissions within an air basin based on the air basin's attainment status for criteria pollutants. These emission thresholds were established for individual development projects that would contribute to regional and local emissions and could adversely affect or delay the Air Basin's projected attainment target goals for nonattainment criteria pollutants.

Because of the conservative nature of the significance thresholds, and the basin-wide context of individual development project emissions, no direct correlation can be made between a single project and localized air quality-related health effects. One individual project that generates emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like nitrogen oxides (NO_x) and reactive organic gases (ROG).

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15 Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

16 Criteria pollutants are defined as those pollutants for which the Federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

Occupants of facilities such as schools, daycare centers, parks and playgrounds, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to air pollutants because these population groups have increased susceptibility to respiratory disease. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions, compared to commercial and industrial areas, because people generally spend longer periods of time at their residences, with greater associated exposure to ambient air quality conditions. Recreational uses are also considered sensitive compared to commercial and industrial uses due to greater exposure to ambient air quality conditions associated with exercise.

Air pollutants and their health effects, and other air pollution-related considerations are summarized in Table 4.2.A and are described in more detail below.

Table 4.2.A: Sources and Health Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood functions and nerve construction. • Behavioral and hearing problems in children.
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardiorespiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board (ARB), 2015.

Ozone (O_3). Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_x. The main sources of ROG and NO_x, often referred to as ozone precursors, are combustion processes (including combustion in motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide (CO). CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. CO transport is limited - it disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels that adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Extremely high levels of CO, such as those generated when a vehicle is running in an unventilated garage, can be fatal.

Particulate Matter (PM). Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from manmade and natural sources. Particulate matter is categorized in two size ranges: PM_{10} for particles less than 10 microns in diameter and $PM_{2.5}$ for particles less than 2.5 microns in diameter. In the Bay Area, motor vehicles generate about half of the air basin's particulates, through tailpipe emissions as well as brake pad, tire wear, and entrained road dust. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of such fine particulates. These fine particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. According to the California Air Resources Board (ARB), studies in the United States and elsewhere have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks, and studies of children's health in California have demonstrated that particle pollution may significantly reduce lung function growth in children. The ARB also reports that statewide attainment of particulate matter standards could prevent thousands of premature deaths, lower hospital admissions for cardiovascular and respiratory disease and asthma-related emergency room visits, and avoid hundreds of thousands of episodes of respiratory illness in California.[17]

Nitrogen Dioxide (NO_2). NO_2 is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring

[17] California Air Resources Board, 2011. *Fact Sheets*. Website: www.arb.ca.gov/html/brochure/pm10.htm October.

component on high pollution days, especially in conjunction with high ozone levels. NO_2 decreases lung function and may reduce resistance to infection.

Sulfur Dioxide (SO_2). SO_2 is a colorless acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease. SO_2 also reduces visibility and the level of sunlight at the ground surface.

Lead. Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery factories. Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the United States Environmental Protection Agency (USEPA) established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The USEPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of the USEPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

Toxic Air Contaminants. In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. Potential human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs do not have ambient air quality standards, but they are regulated by the USEPA and ARB. In 1998, ARB identified particulate matter from diesel-fueled engines as a toxic air contaminant. ARB has completed a risk management process that identified potential cancer risks for a range of activities and land uses that are characterized by use of diesel-fueled engines.[18] High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers, and schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

The BAAQMD regulates TACs using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis in which human health exposure to toxic substances is estimated, and considered together with information regarding the toxic potency of the substances,

[18] California Air Resources Board, 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. October. https://www.arb.ca.gov/diesel/factsheets/rrpfactsheet.pdf

in order to provide a quantitative estimate of health risks.[19] As part of ongoing efforts to identify and assess potential health risks to the public, the BAAQMD has collected and compiled air toxics emissions data from industrial and commercial sources of air pollution throughout the Bay Area. Monitoring data and emissions inventories of TACs help the BAAQMD determine health risk to Bay Area residents.

Ambient monitoring concentrations of TACs indicate that pollutants emitted primarily from motor vehicles (1,3-butadiene and benzene) account for slightly over 50 percent of the average calculated cancer risk from ambient air in the Bay Area.[20] According to the BAAQMD, ambient benzene levels declined dramatically in 1996 with the advent of Phase 2 reformulated gasoline. Due to this reduction, the calculated average cancer risk based on monitoring results has been reduced to 143 in 1,000,000; however, this risk does not include the risk resulting from exposure to diesel particulate matter or other compounds not monitored.

Unlike TACs emitted from industrial and other stationary sources noted above, most diesel particulate matter is emitted from mobile sources – primarily “off-road” sources such as construction and mining equipment, agricultural equipment, and truck-mounted refrigeration units, as well as trucks and buses traveling on freeways and local roadways. Agricultural and mining equipment is not commonly used in urban parts of the Bay Area, while construction equipment typically operates for a limited time at various locations. As a result, the readily identifiable locations where diesel particulate matter is emitted in the Bay Area include high-traffic roadways and other areas with substantial truck traffic.

Although not specifically monitored, recent studies indicate that exposure to diesel particulate matter may contribute significantly to a cancer risk (a risk of approximately 500 to 700 in 1,000,000) that is greater than all other measured TACs combined.[21] The ARB's Diesel Risk Reduction Plan is intended to substantially reduce diesel particulate matter emissions and associated health risks through introduction of ultra-low-sulfur diesel fuel – a step already implemented – and cleaner-burning diesel engines. The technology for reducing diesel particulate matter emissions from heavy-duty trucks is well established, and both State and federal agencies are moving aggressively to regulate engines and emission control systems to reduce and remediate diesel emissions. ARB anticipates that by 2020 average statewide diesel particulate matter concentrations will decrease by 85 percent from levels in 2000 with full implementation of the Diesel Risk Reduction Plan, meaning that the statewide health risk from diesel particulate matter is expected to decrease from 540 cancer cases in 1,000,000 to 21.5 cancer cases in 1,000,000. The Bay Area cancer risk from diesel particulate matter will likely decrease by a similar factor by 2020.

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19 In general, a health risk assessment is required if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk. Such an assessment generally evaluates chronic, long term effects, including the increased risk of cancer as a result of exposure to one or more TACs.

20 Bay Area Air Quality Management District, 2013. *Toxic Air Contaminant Control Program Annual Report 2013 Volume 1.* May. http://www.baaqmd.gov/research-and-data/air-toxics/annual-report

21 Ibid.

High Volume Roadways. Air pollutant exposures and their associated health burdens vary considerably within places in relation to sources of air pollution. Motor vehicle traffic is perhaps the most important source of intra-urban spatial variation in air pollution concentrations. Air quality research consistently demonstrates that pollutant levels are substantially higher near freeways and busy roadways, and human health studies have consistently demonstrated that children living within 100 to 200 meters (328 to 656 feet) of freeways or busy roadways have reduced lung function and higher rates of respiratory disease. At present, it is not possible to attribute the effects of roadway proximity on non-cancer health effects to one or more specific vehicle types or vehicle pollutants. Engine exhaust, from diesel, gasoline, and other combustion engines, is a complex mixture of particles and gases, with collective and individual toxicological characteristics.

4.2.1.2 Existing Climate and Air Quality

The following provides a discussion of the local and regional air quality and climate in the Marin County area.

Regional and Local Air Quality Conditions. The proposed project is located in the Marin County climate subregion in the San Francisco Bay Area. Marin County is wedge shaped, bounded on the west by the Pacific Ocean, on the east by the San Pablo Bay, on the south by the Golden Gate, and on the north by the Petaluma Gap.[22] The county is mostly hilly. A few small towns are located in the western portion of the County, such as Stinson Beach, Bolinas, Inverness, Point Reyes Station, and Dillon Beach, but most of the population lives on the eastern side of the hills, in small, sheltered valleys. Areas along the west coast of Marin County are usually subject to cool marine air. In the summer months, the marine air is cooled as it passes over the offshore upwelling region, and forms a fog layer along the coast. In the winter, proximity to the ocean keeps the coastal regions relatively warm. Temperatures do not vary much over the year at these coastal areas: high 50s in the winter and low 60s in the summer. The warmest months are September and October, which are in the mid to high 60s.

The eastern side of Marin County has warmer weather and less fog.[23] This difference is due less to the blocking effect of the hilly terrain to the west, but more to its distance from the ocean. Although there are a few mountains above 1,500 feet, most of the terrain is only 800 to 1,000 feet high. Much of the time, this elevation is not high enough to block the marine layer, which averages 1,700 feet in depth. Because of the wedge shape of the county, areas to the north are farther from the ocean. This extra distance from the ocean allows the marine air mass to be heated before it arrives at eastern Marin County cities. In south Marin County, the travel distance from the water is short, and the elevations are lower, so there is a higher incidence of cool, unmodified, maritime air.

Cities next to the bay have their temperatures somewhat moderated.[24] For example, San Rafael, being near the bay, experiences average maximum winter temperatures in the high 50s to low 60s and average maximum summer temperatures in the high 70s to low 80s. Inland areas, such as

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22 Bay Area Air Quality Management District, n.d. *Climate, Physiography, and Air Pollution Potential – Bay Area and Its Subregions (Referenced by County)*.

23 Ibid.

24 Ibid.

Kentfield, experience average maximum temperatures two degrees cooler in the winter and two degrees warmer in the summer. Average minimum temperatures in San Rafael are in the low 40s in the winter and low 50s in the summer. Minimum temperatures in Kentfield are two degrees cooler all year.

Wind speeds are highest along the west coast of Marin, about 8 to 10 mph.[25] Although most of the terrain throughout central Marin County is not high enough to act as a barrier to the marine air flow, the complex terrain creates sufficient friction to slow the air flow. Downwind, at Hamilton Air Force Base in northeastern Marin County, the annual average wind speeds are only 5 mph. The prevailing wind directions throughout Marin County show less variation and are generally from the northwest.

The mountainous terrain in Marin County has higher rainfall amounts than most parts of the Bay Area (the southern Santa Cruz Mountains report higher rainfall amounts).[26] Near Mount Tamalpais, rainfall amounts are twice as high as the rest of the Bay Area, with San Rafael reporting an average of 37.5 inches per year and Kentfield reporting 49 inches per year. Farther north, Hamilton Air Force Base and Petaluma report 26 and 24 inches, respectively. Consistent with the Bay Area Mediterranean climate, 84 percent of the annual rainfall in Marin occurs November through March.

Air pollution potential is highest on the eastern side of Marin County.[27] This area is where the semi-sheltered valleys and largest population centers are located. Currently, most of the development has been along the bay, particularly in southern Marin. In the south, where distances to the ocean are short, the influence of the marine air keeps the pollution levels low. As development moves farther north where the valleys are more sheltered from the sea breeze, it will encounter greater pollution potential.

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment. Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants and the number of days during which the region exceeds air quality standards have fallen dramatically. Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons.

Ozone levels, measured by peak concentrations and the number of days over the State 1-hour standard, have declined substantially as a result of aggressive programs by the BAAQMD and other regional, State, and federal agencies. The reduction of peak concentrations represents progress in improving public health; however, the Bay Area still exceeds the State standard for 1-hour ozone as well as the State and federal 8-hour standards. Levels of PM_{10} have exceeded State standards two of the last 3 years, and the area is considered a nonattainment area for this pollutant relative to the State standards. The Bay Area is an unclassified area for the federal PM_{10} standard.

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25 Ibid.
26 Ibid.
27 Ibid.

No exceedances of the State or federal CO standards have been recorded at any of the region's monitoring stations since 1991. The Bay Area is currently considered a maintenance area for State and federal CO standards.

Attainment Status Designations. The ARB and USEPA designate areas of the State as attainment, nonattainment, or unclassified for each State or federal standard, respectively. An "attainment" designation for an area signifies that pollutant concentrations did not violate pollutant standards. A "nonattainment" designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An "unclassified" designation signifies that data do not support either an attainment or nonattainment status. The State also divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category. Table 4.2.B provides a summary of the attainment status for the San Francisco Bay Area with respect to national and State ambient air quality standards.

Table 4.2.B: Bay Area Attainment Status

Pollutant	Averaging Time	California Standards [a]		National Standards [b]	
		Concentration	Attainment Status	Concentration [c,j]	Attainment Status
Ozone (O_3)	8-Hour	0.070 ppm (137 µg/m^3)	Nonattainment [h]	0.075 ppm	Nonattainment [d]
	1-Hour	0.09 ppm (180 µg/m^3)	Nonattainment	Not Applicable	Not Applicable [e]
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment [f]
	1-Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	1-Hour	0.18 ppm (339 µg/m^3)	Attainment	0.100 ppm	Unclassified
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	Not Applicable	0.053 ppm (100 µg/m^3)	Attainment
Sulfur Dioxide (SO_2)	24-Hour	0.04 ppm (105 µg/m^3)	Attainment	0.14 ppm (365 µg/m^3)	Attainment
	1-Hour	0.25 ppm (655 µg/m^3)	Attainment	Not Applicable	Attainment
	Annual Arithmetic Mean	Not Applicable	Not Applicable	0.030 ppm (80 µg/m^3)	Attainment
Particulate Matter Coarse (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	Nonattainment [g]	Not Applicable	Not Applicable
	24-Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified
Particulate Matter Fine ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	Nonattainment [g]	12 µg/m^3	Attainment
	24-Hour	Not Applicable	Not Applicable	35 µg/m^3 [i]	Nonattainment

[a] California standards for ozone, carbon monoxide (except in the Lake Tahoe air basin), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter – PM_{10}, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour, or 24-hour average (i.e., all standards except for lead and the PM_{10} annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on average. The

Table 4.2.B: Bay Area Attainment Status

Pollutant	Averaging Time	California Standards [a]		National Standards [b]	
		Concentration	Attainment Status	Concentration [c,j]	Attainment Status

Lake Tahoe CO standard is 6.0 ppm, a level one-third the national standard and two-thirds the State standard.

[b] National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates, and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than 1. The 8-hour ozone standard is attained when the 3-year average of the fourth highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m^3. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m^3. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM_{10} is met if the 3-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the 3-year average of annual averages spatially averaged across officially designed clusters of sites falls below the standard.

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

[d] In June 2004, the Bay Area was designated as a marginal nonattainment area for the national 8-hour ozone standard. USEPA lowered the national 8-hour ozone standard from 0.80 to 0.75 ppm (i.e., 75 ppb), effective May 27, 2008.

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

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

[g] In June 2002, ARB established new annual standards for $PM_{2.5}$ and PM_{10}.

[h] The 8-hour California ozone standard was approved by the ARB on April 28, 2005 and became effective on May 17, 2006.

[i] USEPA lowered the 24-hour $PM_{2.5}$ standard from 65 µg/m^3 to 35 µg/m^3 in 2006. The USEPA designated the Bay Area as nonattainment for the 35 µg/m^3 $PM_{2.5}$ standard on October 8, 2009. The effective date of the designation is December 14, 2009, and the BAAQMD has 3 years to develop a plan called a State Implementation Plan (SIP) that demonstrates how the Bay Area will achieve the revised standard by 2014. The SIP for the new standard must be submitted to the USEPA by December 14, 2012.

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

Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.

ppm = parts per million

mg/m^3 = milligrams per cubic meter

µg/m^3 = micrograms per cubic meter

Source: Bay Area Air Quality Management District, Bay Area Attainment Status, 2015.

Air Quality Monitoring Results. Air quality monitoring stations are located throughout the nation and maintained by the local air pollution control district and state air quality regulating agencies. Ambient air data collected at permanent monitoring stations are used by the USEPA to identify regions as attainment or nonattainment depending on whether the regions met the requirements stated in the primary NAAQS. Attainment areas are required to maintain their status through moderate, yet effective air quality maintenance plans. Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment such as marginal, moderate, serious, severe, and extreme are used to classify each air basin in the state on a pollutant-by-pollutant basis. Different classifications have different mandated attainment dates and are used as guidelines to create air quality management strategies to improve air quality and comply with the NAAQS by the attainment date. A region is determined to be unclassified when the data collected from the air quality monitoring stations do not support a designation of attainment or nonattainment, due to lack of information, or a conclusion cannot be made with the available data.

The closest ambient air quality monitoring station to the project site is located in San Rafael. Monitored pollutants include CO, O_3, PM_{10}, $PM_{2.5}$, and NO_2. The San Rafael station does not monitor SO_2. The next closest monitoring station is located in Richmond. Air quality trends at these

monitoring stations are representative of the ambient air quality in the project area. Thus, the data shown in Table 4.2.C provide a good characterization of levels of these pollutants within the project site.

Table 4.2.C summarizes pollutant concentrations and exceedances of State and federal standards in Marin County during the period 2014 through 2016. The ambient air quality data in Table 4.2.C indicate that air quality in Marin County has generally been good. As indicated in the monitoring results, the CO, O_3, PM_{10}, $PM_{2.5}$, SO_2, and NO_2 standards were not exceeded in this area during the 3-year period.

4.2.2 Regulatory Framework

Air quality standards, the regulatory framework, and State and federal attainment status are discussed below.

The BAAQMD is primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as for monitoring ambient pollutant concentrations. The BAAQMD's jurisdiction encompasses seven counties – Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa – and portions of Solano and Sonoma Counties. The ARB and the USEPA regulate direct emissions from motor vehicles.

4.2.2.1 United States Environmental Protection Agency

At the federal level, the USEPA has been charged with implementing national air quality programs. USEPA's air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990.

The FCAA required USEPA to establish primary and secondary NAAQS and required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The FCAA Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. USEPA has the responsibility to review all state SIPs to determine conformity with the mandates of the FCAA and determine if implementation will achieve air quality goals. If the USEPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area, which imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions on transportation funding and stationary air pollution sources in the air basin.

The USEPA is also required to develop National Emission Standards for Hazardous Air Pollutants, which are defined as those which may reasonably be anticipated to result in increased deaths or serious illness and which are not already regulated. An independent science advisory board reviews the health and exposure analyses conducted by the USEPA on suspected hazardous pollutants prior to regulatory development.

Table 4.2.C: Ambient Air Quality at the San Rafael Monitoring Station

Pollutant	Standard	2014	2015	2016
Carbon Monoxide (CO)				
Maximum 1-hour concentration (ppm)		1.9	1.4	1.4
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8-hour concentration (ppm)		1.1	0.9	1.0
Number of days exceeded:	State: > 9 ppm	0	0	0
	Federal: > 9 ppm	0	0	0
Ozone (O_3)				
Maximum 1-hour concentration (ppm)		0.088	0.081	0.088
Number of days exceeded:	State: > 0.09 ppm	0	0	0
Maximum 8-hour concentration (ppm)		0.068	0.070	0.067
Number of days exceeded:	State: > 0.07 ppm	0	0	0
	Federal: > 0.08 ppm	0	0	0
Coarse Particulates (PM_{10})				
Maximum 24-hour concentration (µg/m^3)		40.9	42.0	27.0
Number of days exceeded:	State: > 50 µg/m^3	0	0	0
	Federal: > 150 µg/m^3	0	0	0
Annual arithmetic average concentration (µg/m^3)		14.1	16.1	13.8
Exceeded for the year:	State: > 20 µg/m^3	No	No	No
	Federal: > 50 µg/m^3	No	No	No
Fine Particulates ($PM_{2.5}$)				
Maximum 24-hour concentration (µg/m^3)		38.1	36.3	15.6
Number of days exceeded:	Federal: > 35 µg/m^3	1	2	0
Annual arithmetic average concentration (µg/m^3)		10.7	8.7	6.5
Exceeded for the year:	State: > 12 µg/m^3	No	No	No
	Federal: > 12 µg/m^3	No	No	No
Nitrogen Dioxide (NO_2)				
Maximum 1-hour concentration (ppm)		0.062	0.044	0.045
Number of days exceeded:	State: > 0.250 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.011	0.011	0.009
Exceeded for the year:	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO_2)[1]				
Maximum 1-hour concentration (ppm)		0.019	0.012	0.013
Number of days exceeded:	State: > 0.25 ppm	0	0	0
Maximum 3-hour concentration (ppm)		ND	ND	ND
Number of days exceeded:	Federal: > 0.50 ppm	ND	ND	ND
Maximum 24-hour concentration (ppm)		0.005	0.0028	0.0004
Number of days exceeded:	State: > 0.04 ppm	0	0	0
	Federal: > 0.14 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.0005	0.0006	0.0007
Exceeded for the year:	Federal: > 0.030 ppm	No	No	No

[1] Data from the Richmond monitoring site.
ppm = parts per million
µg/m^3 = micrograms per cubic meter
ND = No data. There was insufficient (or no) data to determine the value.
Source: USEPA, 2017.

4.2.2.2 California Air Resources Board

The ARB is the agency responsible for the coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA), adopted in 1988. The CCAA requires that all air districts in the State achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. The CCAA specifies that districts should focus on reducing the emissions from transportation and air-wide emission sources, and provides districts with the authority to regulate indirect sources.

ARB is also primarily responsible for developing and implementing air pollution control plans to achieve and maintain the NAAQS. ARB is primarily responsible for statewide pollution sources and produces a major part of the SIP. Local air districts provide additional strategies for sources under their jurisdiction. ARB combines these data and submits the completed SIP to USEPA.

Other ARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control and air quality management districts), establishing CAAQS (which are more stringent than the NAAQS), determining and updating area designations and maps, and setting emissions standards for mobile sources, consumer products, small utility engines, and off-road vehicles. The ARB's Diesel Risk Reduction Plan is intended to substantially reduce diesel particulate matter emissions and associated health risks through introduction of ultra-low-sulfur diesel fuel – a step already implemented – and cleaner-burning diesel engines.

Because of the robust evidence relating proximity to roadways and a range of non-cancer and cancer health effects, the ARB also created guidance for avoiding air quality conflicts in land use planning in its Air Quality and Land Use Handbook: A Community Health Perspective. In its guidance, the ARB advises that new sensitive uses (e.g., residences, schools, day care centers, playgrounds, and hospitals) not be located within 500 feet of a freeway or urban roads carrying 100,000 vehicles per day, or within 1,000 feet of a distribution center (warehouse) that accommodates more than 100 trucks or more than 90 refrigerator trucks per day.

ARB guidance suggests that the use of these guidelines be customized for individual land use decisions, and take into account the context of development projects. The Air Quality and Land Use Handbook specifically states that these recommendations are advisory and acknowledges that land use agencies must balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

4.2.2.3 National and State Ambient Air Quality Standards

Pursuant to the FCAA of 1970, the USEPA established NAAQS. The NAAQS were established for major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

Both the USEPA and the ARB have established ambient air quality standards for the following common pollutants: CO, O_3, NO_2, SO_2, Pb, and PM. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

These ambient air quality standards are levels of contaminants that avoid specific adverse health effects associated with each pollutant.

Federal standards include both primary and secondary standards. Primary standards establish limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.[28] State and federal standards for the criteria air pollutants are listed in Table 4.2.D.

4.2.2.4 Bay Area Air Quality Management District

The BAAQMD seeks to attain and maintain air quality conditions in the San Francisco Bay Area Air Basin through a comprehensive program of planning, regulation, enforcement, technical innovation, and education. The clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. The BAAQMD also inspects stationary sources and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by law.

Table 4.2.D: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
Ozone (O_3)[h]	1-Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM_{10})[i]	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		–		
Fine Particulate Matter ($PM_{2.5}$)[i]	24-Hour	–		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	–	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–	–	
Nitrogen Dioxide (NO_2)[j]	Annual Arithmetic Mean	0.03 ppm (57 µg/m^3)	Gas Phase Chemi-luminescence	53 ppb (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemi-luminescence
	1-Hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3)	–	
Lead (Pb)[l,m]	30-Day Average	1.5 µg/m^3	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m^3 (for certain areas)[l]	Same as Primary Standard	
	Rolling 3-	–		0.15 µg/m^3		

[28] U.S. Environmental Protection Agency, 2011. Website: www.epa.gov/air/criteria.html (Accessed March 18, 2015). October.

Table 4.2.D: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
	Month Average[i]					
Sulfur Dioxide (SO_2)[k]	24-Hour	0.04 ppm (105 µg/m^3)	Ultraviolet Fluorescence	0.14 ppm (for certain areas)	–	Ultraviolet Fluorescence; Spectro-photometry (Pararosaniline Method)
	3-Hour	–		–	0.5 ppm (1,300 µg/m^3)	
	1-Hour	0.25 ppm (655 µg/m^3)		75 ppb (196 µg/m^3)[k]	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)[k]	–	
Visibility-Reducing Particles[l]	8-Hour	See footnote n	Beta Attenuation and Transmittance through Filter Tape	No Federal Standards		
Sulfates	24-Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[j]	24-Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

[a] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles) are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact USEPA for further clarification and current national policies.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] Any equivalent measurement method which can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.

[e] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[f] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[g] Reference method as described by the USEPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the USEPA.

[h] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[j] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[k] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm).

Table 4.2.D: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]

To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[l] The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[m] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[n] In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

CARB = California Air Resources Board
USEPA = United States Environmental Protection Agency
ppb = parts per billion
ppm = parts per million
mg/m^3 = milligrams per cubic meter
µg/m^3 = micrograms per cubic meter

Source: California Air Resources Board, 2016. https://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

BAAQMD Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds.[29] This regulation limits the "discharge of any odorous substance which causes the ambient air at or beyond the property line…to be odorous and to remain odorous after dilution with four parts of odor-free air." The BAAQMD must receive odor complaints from ten or more complainants within a 90-day period in order for the limitations of this regulation to go into effect. If this criterion has been met, an odor violation can be issued by the BAAQMD if a test panel of people can detect an odor in samples collected periodically from the source.

Clean Air Plan. The Clean Air Plan guides the region's air quality planning efforts to attain the CAAQS. The BAAQMD's 2017 Clean Air Plan, adopted on April 19, 2017 by the BAAQMD's Board of Directors, is the current Clean Air Plan which contains district-wide control measures to reduce ozone precursor emissions (i.e., ROG and NO_x), particulate matter, and greenhouse gas emissions.

The Bay Area 2017 Clean Air Plan:

- Describes the Air District's plan toward attaining all state and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities;
- Defines a vision for transitioning the region to a post-carbon economy needed to achieve ambitious greenhouse gas reduction targets for 2030 and 2050;

[29] Bay Area Air Quality Management District, 1982. *Rules and Regulations, Regulation 7: Odorous Substances.* March.

- Provides a regional climate protection strategy that will put the Bay Area on a pathway to achieve GHG reduction targets; and

- Includes a wide range of control measures designed to decrease emissions of air pollutants that are most harmful to Bay Area residents, such as particulate matter, ozone, and toxic air contaminants; to reduce emissions of methane and other "Super-GHGs" that are potent climate pollutants in the near term; and to decrease emissions of carbon dioxide by reducing fossil fuel combustion.

BAAQMD CEQA Air Quality Guidelines. The BAAQMD CEQA Air Quality Guidelines were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. The Guidelines also include recommended assessment methodologies for air toxics, odors, and greenhouse gas emissions.

In June 2010, BAAQMD adopted updated draft California Environmental Quality Act (CEQA) Air Quality Guidelines and finalized them in May 2011. These guidelines superseded previously adopted agency air quality guidelines of 1999 and were intended to advise lead agencies on how to evaluate potential air quality impacts.

In May 2017, the BAAQMD published an updated version of the CEQA Guidelines. The 2017 CEQA Guidelines include thresholds to evaluate project impacts in order to protectively evaluate the potential effects of the project on air quality. These protective thresholds are appropriate in the context of the size, scale, and location of the project.

4.2.2.5 County of Marin

Marin Countywide Plan. The County of Marin addresses air quality in the Natural Systems & Agriculture Element of the Marin Countywide Plan.[30] The Countywide Plan includes goals, policies, and implementing programs that promote planning and programs that result in the reduction of airborne pollutants measured within the county and the Bay Area, minimize the potential impacts from land uses that may emit pollution and/or odors on residential and other land uses sensitive to such emissions, reduce vehicle trips and emissions, and improve vehicle efficiency, as a means of limiting the volume of pollutants generated by traffic. Policies and implementing programs relevant to this project include the following:

- **Policy AIR-1.1: Coordinate Planning and Evaluation Efforts.** Coordinate air quality planning efforts with local, regional, and State agencies, and evaluate the air quality impacts of proposed plans and development projects.

[30] Marin, County of. 2007. *Marin Countywide Plan.* November 6.

- **Policy AIR-1.3: Require Mitigation of Air Quality Impacts.** Require projects that generate potentially significant levels of air pollutants, such as quarry, landfill operations, or large construction projects, to incorporate best available air quality mitigation in the project design.
    - **Implementing Program AIR-1.a: Inform Local and Regional Agencies.** Notify local and regional jurisdictions of proposed projects in unincorporated areas that may affect regional air quality, as identified by project type and size thresholds in the BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans.
    - **Implementing Program AIR-1.b: Evaluate Air Quality Impacts of Proposed Projects and Plans.** As part of the Environmental Review Process, use the current BAAQMD CEQA Guidelines to evaluate the significance of air quality impacts from projects or plans, and to establish appropriate minimum submittal and mitigation requirements necessary for project or plan approval.
    - **Implementing Program AIR-1.g: Require Control Measures for Construction and Agricultural Activity.** Require reasonable and feasible measures to control particulate emissions (PM_{10} and $PM_{2.5}$) at construction sites and during agricultural tilling activity, pursuant to the recommendations in the BAAQMD CEQA Guidelines, which may include the following:
        - Watering active construction or agricultural tilling areas.
        - Covering hauled materials.
        - Paving or watering vehicle access roads.
        - Sweeping paved and staging areas.
- **Policy AIR-2.1: Buffer Emission Sources and Sensitive Land Uses.** Consider potential air pollution and odor impacts from land uses that may emit pollution and/or odors when locating (a) air pollution sources, and (b) residential and other pollution-sensitive land uses in the vicinity of air pollution sources (which may include freeways, manufacturing, extraction, hazardous materials storage, landfill, food processing, wastewater treatment, and other similar uses).
    - **Implementing Program AIR-2.a: Require Separation Between Air Pollution Sources and Other Land Uses.** Only allow (a) emission sources or (b) other uses in the vicinity of air pollution or odor sources if the minimum screening distances between sources and receptors established in the BAAQMD CEQA Guidelines can be met, unless detailed project-specific studies demonstrate compatibility with adjacent uses despite separations that do not meet the screening distance requirements.
    - **Implementing Program AIR-2.b: Protect Sensitive Receptors Near High-Volume Roadways.** Amend the Development Code to require mitigation measures such as increased indoor air filtration to ensure the protection of sensitive receptors (facilities where individuals are highly susceptible to the adverse effects of air pollutants, such as housing, child care centers, retirement homes, schools, and hospitals) near freeways, arterials, and other major transportation corridors.

- **Policy AIR-3.1: Institute Transportation Control Measures.** Support a transportation program that reduces vehicle trips, increases ridesharing, and meets or exceeds the Transportation Control Measures recommended by BAAQMD in the most recent Clean Air Plan to reduce pollutants generated by vehicle use.
    - **Implementing Program AIR-3.d: Reduce Peak-Hour Congestion.** Implement recommended BAAQMD Transportation Control Measures in the Clean Air Plan to reduce vehicle emissions and congestion during peak commute periods.
    - **Implementing Program AIR-3.e: Improve Arterial Traffic Management.** Modify arterial roadways to allow more-efficient bus operation, including possible signal preemption, and expand signal-timing programs where air quality benefits can be demonstrated.

4.2.2.6 City of Larkspur

City of Larkspur General Plan. The City of Larkspur addresses air quality in the Health and Safety Element of the Larkspur General Plan.[31] The General Plan includes goals, policies, and action programs that aim to ensure that air pollution levels do not threaten public health and safety. Policies and action programs relevant to this project include the following:

- **Policy R:** Seek to comply with State and federal standards for air quality.
- **Policy S:** Seek to reduce auto travel and, thereby, the pollutants from auto emissions.

    Action Program 37: Require new development to mitigate impacts if the project causes a change in the level of air pollutants by a specified amount.

4.2.3 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard;
- Contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

[31] Larkspur, City of. 1990. *Larkspur 1990 General Plan*.

Implementation of the proposed project would have a significant impact on the environment related to air quality if it would:

- During project construction, result in average daily emissions of 54 pounds per day of ROG, NO_x, or $PM_{2.5}$ or 82 pounds per day of PM_{10};
- During project operation, result in average daily emissions of 54 pounds per day of ROG, NO_x, or $PM_{2.5}$ or 82 pounds per day of PM_{10}; or result in maximum annual emissions of 10 tons per year of ROG, NO_x, or $PM_{2.5}$ or 15 tons per year of PM_{10};
- Contribute to carbon monoxide (CO) concentrations exceeding the CAAQS of nine parts per million (ppm) averaged over eight hours and 20 ppm for one hour;[32]
- For new sources of Toxic Air Contaminants (TACs), during either project construction or project operation, expose sensitive receptors to substantial levels of TACs under project conditions resulting in (a) an increase in cancer risk level greater than 10 in one million, (b) a non-cancer risk (chronic or acute) hazard index greater than 1.0, or (c) an increase of annual average $PM_{2.5}$ of greater than 0.3 micrograms per cubic meter; or, under cumulative conditions, resulting in (a) a cancer risk level greater than 100 in a million, (b) a non-cancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 micrograms per cubic meter;[33]
- Expose new sensitive receptors to substantial ambient levels of Toxic Air Contaminants (TACs) resulting in (a) a cancer risk level greater than 100 in a million, (b) a non-cancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 micrograms per cubic meter;[34]

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32 Pursuant to BAAQMD CEQA Guidelines, localized CO concentrations should be estimated for projects in which (a) project-generated traffic would conflict with an applicable congestion management program established by the county congestion management agency or (b) project-generated traffic would increase traffic volumes at affected intersections to more than 44,000 vehicles per hour (or 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited, such as tunnels, parking garages, bridge underpasses, natural or urban street canyons, and below-grade roadways).

33 Pursuant to the BAAQMD CEQA Guidelines, when siting new TAC sources consider receptors located within 1,000 feet. For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, and medical centers. The cumulative analysis should consider the combined risk from all TAC sources.

34 Pursuant to the BAAQMD CEQA Guidelines when siting new sensitive receptors consider TAC sources located within 1,000 feet including, but not limited to, stationary sources, freeways, major roadways (10,000 or greater vehicles per day), truck distribution centers, airports, seaports, ferry terminals, and rail lines. For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, and medical centers.

- Frequently and for a substantial duration, create or expose sensitive receptors to substantial objectionable odors affecting a substantial number of people;[35] or

- Significantly reduce sunlight or introduce shadows in areas used extensively by the public.

4.2.4 Impacts and Mitigation Measures

The following discussion analyzes impacts related to land use that could result from project implementation. Air pollutant emissions associated with the proposed project would primarily occur short-term in association with construction activities, including excavation and vehicle/equipment use. Long-term operational emissions would result from vehicle trips to and from the project site. The following is a description of potential air quality impacts that could occur as a result of the proposed project including short-term construction emissions, such as fugitive dust, and long-term operational emissions. All impacts would be less than significant.

(1) Conflict with Current Air Quality Plans. The applicable air quality plan is the BAAQMD's 2017 Clean Air Plan, adopted on April 19, 2017. The 2017 Clean Air Plan/Regional Climate Protection Strategy serves as a roadmap for the BAAQMD to reduce air pollution and protect public health and the global climate. The 2017 Clean Air Plan also includes measures and programs to reduce emissions of fine particulates and toxic air contaminants. In addition, the Regional Climate Protection Strategy is included in the 2017 Clean Air Plan, which identifies potential rules, control measures, and strategies that the BAAQMD can pursue to reduce greenhouse gases throughout the Bay Area.

Consistency with the 2017 Clean Air Plan is determined by whether or not the proposed project would result in significant and unavoidable air quality impacts or hinder implementation of control measures (e.g., excessive parking or preclude extension of transit lane or bicycle path). The proposed project would rehabilitate an existing roadway, including roadway repaving, intersection geometry and striping modifications, installation of pedestrian, bicyclist, and Americans with Disabilities Act (ADA) improvements, installation of drainage improvements, and replacement and installation of water supply mains. Implementation of the proposed project would improve access and safety for vehicles, bicyclists, and pedestrians. In general, the project would promote the BAAQMD's initiatives to reduce vehicle trips and vehicle miles traveled (VMT) and would support the use of alternate means of transportation.

In addition, as indicated in the analysis that follows, the proposed project would not result in significant operational and construction-period emissions. Therefore, the proposed project supports the goals of the Clean Air Plan and would not conflict with any of the control measures identified in the plan or designed to bring the region into attainment. Additionally, the proposed project would not substantially increase the population, vehicle trips, or VMT. The proposed project would not hinder the region from attaining the goals outlined in the Clean Air Plan. Therefore, the proposed project would not hinder or disrupt implementation of any control measures from the Clean Air Plan.

[35] For this threshold, sensitive receptors include residential uses, schools, daycare centers, parks, nursing homes, and medical centers.

(2) Violate Any Air Quality Standards. According to the BAAQMD CEQA Guidelines, to meet air quality standards for operational-related criteria air pollutant and air precursor impacts, the project must not:

- Contribute to CO concentrations exceeding the State ambient air quality standards;
- Generate average daily construction emissions of ROG, NO_x or $PM_{2.5}$ (exhaust) greater than 54 pounds per day or PM_{10} exhaust emissions greater than 82 pounds per day; or
- Generate operational emissions of ROG, NO_x or $PM_{2.5}$ of greater than 10 tons per year or 54 pounds per day or PM_{10} emissions greater than 15 tons per year or 82 pounds per day.

The following section describes the project's CO impacts and construction- and operation-related air quality impacts. The proposed project would rehabilitate and improve an existing roadway. The discussion for localized CO impacts and operational emissions analyzes the impact of the proposed project. The conclusions are summarized at the end of each subsection. As discussed, impacts would be less than significant for localized CO emission and operational emissions. Impacts associated with construction-period emissions would be less than significant with implementation of recommended mitigation measures.

Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate matter emissions (i.e., fugitive dust) generated by excavation, grading, hauling, and other activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, ROG, directly emitted particulate matter ($PM_{2.5}$ and PM_{10}), and TACs such as diesel exhaust particulate matter.

Site preparation and project construction would involve clearing, cut-and-fill activities, grading, and other activities. Construction-related effects on air quality from the proposed project would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils on the site. If not properly controlled, these activities would temporarily generate PM_{10}, $PM_{2.5}$, and to a lesser extent CO, SO_2, NO_x, and volatile organic compounds. Sources of fugitive dust would include disturbed soils at the construction sites and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, the silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site. These emissions would be temporary and limited to the immediate area surrounding the construction sites.

<u>Impact AIR-1</u>: Construction of the proposed project would generate air pollutant emissions that could violate air quality standards. (S)

The BAAQMD has established standard measures for reducing fugitive dust emissions ($PM_{2.5}$ and PM_{10}) including the use of water or other soil stabilizers. With the implementation of Basic

Construction Mitigation Measures such as frequent watering (e.g., two times per day at a minimum), fugitive dust emissions from construction activities would not result in adverse air quality impacts.[36] Construction-period impacts associated with construction of the proposed project are discussed below. As discussed, with implementation of recommended mitigation measures, these impacts would be less than significant.

Construction emissions were estimated for the project using the Sacramento Metropolitan Air Quality Management District's Road Construction Emissions Model, Version 6.3.2 (Roadmod) as recommended by the BAAQMD for roadway projects. The project would include approximately 3,000 truck trips of soil off-haul, which was included as an input to the Roadmod analysis. Other details of construction activities are unknown at this time; therefore, default assumptions (e.g., construction fleet activities) from Roadmod were assumed. Construction of the proposed project would occur over a period of 24 months. Construction-related emissions are presented in Table 4.2.E. Detailed calculations are provided in Appendix E.

As shown in Table 4.2.E, construction emissions of ozone precursors (ROG and NO_x) and particulate matter would not exceed the BAAQMD's threshold for average daily construction emissions.

Table 4.2.E: Construction Emissions Estimates

Source	Pollutant Emissions (Pounds/Day)			
	ROG	**NO_x**	**Exhaust $PM_{2.5}$**	**Exhaust PM_{10}**
Grubbing/Land Clearing	1.4	14.0	0.6	0.6
Grading/Excavation	6.8	71.9	3.1	3.5
Drainage/Utilities/Sub-Grade	3.7	34.4	1.6	1.8
Paving	1.7	15.8	0.8	0.9
Maximum Daily (pounds/day)	6.8	71.9	3.1	3.5
Average Daily (pounds/day)	**4.4**	**44.6**	**2.0**	**2.2**
BAAQMD Thresholds	54.0	54.0	54.0	82.0
Exceed Threshold?	**No**	**No**	**No**	**No**

Source: LSA Associates, Inc., June 2017.

The effects of construction activities would be increased dust and locally elevated levels of PM10 downwind of construction activity. Although ROG, NOx, and exhaust emissions would not exceed the established thresholds, the BAAQMD requires the implementation of Basic Construction Mitigation Measures to ensure construction impacts are minimized. Implementation of the following mitigation measure would require implementation of the BAAQMD's Basic Construction Mitigation Measures and would reduce diesel PM exhaust emissions as well as construction dust (PM10 and PM2.5) impacts to a less-than-significant level.

> Mitigation Measure AIR-1: The County of Marin and project contractor shall follow Basic Construction Mitigation Measures as recommended by the BAAQMD, including:

[36] Bay Area Air Quality Management District, 2017. op. cit.

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt tracked-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- A publicly visible sign shall be posted with the telephone number and person to contact at Marin County regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD phone number shall also be visible to ensure compliance with applicable regulations. (LTS)

Significance After Mitigation. Mitigation Measure AIR-1 would require implementation of the BAAQMD's Basic Construction Mitigation Measures and would reduce diesel PM exhaust emissions as well as construction dust (PM_{10} and $PM_{2.5}$) impacts to a less-than-significant level.

(3) Operational Emissions. Long-term air emission impacts are associated with stationary sources and mobile sources. Stationary source emissions result from the consumption of natural gas and electricity. Mobile source emissions result from vehicle trips and result in air pollutant emissions affecting the entire air basin. The proposed project consists of roadway improvements, including roadway repaving, intersection geometry and striping modifications, installation of pedestrian, bicyclist, and ADA improvements, installation of drainage improvements, and replacement and installation of water supply mains. The proposed project includes roadway improvements that maintain and improve travel efficiency on Sir Francis Drake Boulevard; therefore, the proposed project would not result in an increase in vehicular trips through the project area. The project would not be a source of stationary source emissions. Therefore, operation of the project would not be expected to result in a violation of air quality standards.

(4) Localized CO Impacts. Emissions and ambient concentrations of CO have decreased dramatically in the Bay Area with the introduction of the catalytic converter in 1975. No

exceedances of the State or federal CO standards have been recorded at Bay Area monitoring stations since 1991. The BAAQMD's 2017 CEQA Guidelines include recommended methodologies for quantifying concentrations of localized CO levels for proposed transportation projects. A screening level analysis using guidance from the BAAQMD CEQA Guidelines was performed to determine impacts of the project's concentrations. The screening methodology provides a conservative indication of whether the implementation of a proposed project would result in significant CO emissions. According to the BAAQMD's CEQA Guidelines, a proposed project would result in a less-than-significant impact to localized CO concentrations if the following screening criteria are met:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, and the regional transportation plan and local congestion management agency plans.
- Project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
- The project would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, or below-grade roadway).

Implementation of the proposed project would not conflict with the Transportation Authority of Marin's Congestion Management Program for designated roads or highways, a regional transportation plan, or other agency plans. The project site is also not located in an area where vertical or horizontal mixing of air is substantially limited. Based upon recent traffic data, the Sir Francis Drake Boulevard average volume of daily traffic is between 35,600 and 49,500 vehicles per day, with the heaviest volume on the east of the corridor approaching Highway 101. However, implementation of the proposed project would not increase traffic volumes. Intersection level of service (LOS) associated with the project would not decline with the project. The proposed project would reduce traffic congestion and improve LOS, which would contribute to a reduction in CO concentrations at intersections. Therefore, the proposed project would not result in localized CO concentrations that exceed State or federal standards and this impact would be less than significant.

(5) Substantial Pollutant Concentrations. Sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to diesel particulate matter. Exposure from diesel exhaust associated with construction activity contributes to both cancer and chronic non-cancer health risks.

According to the BAAQMD, a project would result in a significant impact if it would: individually expose sensitive receptors to TACs resulting in an increased cancer risk greater than 10.0 in one million, increased non-cancer risk of greater than 1.0 on the hazard index (chronic or acute), or an annual average ambient $PM_{2.5}$ increase greater than 0.3 $\mu g/m^3$.[37] A significant cumulative impact would occur if the project in combination with other projects located within a 1,000-foot radius of

[37] Ibid.

the project site would expose sensitive receptors to TACs resulting in an increased cancer risk greater than 100.0 in one million, an increased non-cancer risk of greater than 10.0 on the hazard index (chronic), or an ambient $PM_{2.5}$ increase greater than 0.8 µg/m^3 on an annual average basis.[38] Impacts from substantial pollutant concentrations are discussed below and would be less than significant.

Single-family residences are located adjacent to the existing pavement. Other sensitive receptors within the project area include multi-family housing and Bacich Elementary School, Kent Middle School, Marin Catholic High School, College of Marin, and Marin General Hospital. Construction activities associated with the project may expose these receptors to airborne particulates and fugitive dust, as well as a small quantity of pollutants associated with the use of construction equipment (e.g., diesel-fueled vehicles and equipment) on a short-term basis. As shown in Table 4.2-5, the project construction would generate PM_{10} and $PM_{2.5}$ emissions that are well below the BAAQMD's significance criteria. Additionally, implementation of the Basic Construction Mitigation Measures required in Mitigation Measure AIR-1 would reduce construction-related emissions to a less-than-significant level, thus minimizing possible exposure of these sensitive receptors to substantial pollutant concentrations during construction. Additionally, due to the linear nature of the project, construction activities at any one receptor location would occur for a limited duration. Once the project is constructed, the project would not be a source of substantial toxic emissions. The proposed project would not increase vehicle trips and would therefore not result in additional emissions. Therefore, sensitive receptors are not expected to be exposed to substantial pollutant concentrations during project construction or operation.

(6) Odors. During construction, the various diesel powered vehicles and equipment in use at the project site could create localized odors. Potential impacts are discussed below and would be less than significant. Construction-period odors would be temporary and are not likely to be noticeable for extended periods of time beyond the project site. The potential for diesel odor impacts is therefore considered less than significant. Implementation of the proposed project would not change the use of the site and is not expected to produce any offensive odors that would result in frequent odor complaints. Therefore, this impact would be less than significant.

[38] Ibid.

4.3 BIOLOGICAL RESOURCES

This section addresses the biological resources on the project site including: (1) vegetation communities and wildlife habitats; (2) regulatory context; (3) potentially occurring special-status species; (4) sensitive habitats such as wetlands; and (5) potential impacts to biological resources associated with implementation of the proposed project. Mitigation measures are identified as necessary.

4.3.1 Methods

A literature review and field surveys were conducted to identify special-status plant and wildlife species, as well as sensitive habitats that could be present on and within 200 feet of the proposed project site (project study area), where accessible.

Prior to conducting fieldwork, LSA collected information on special-status species known to occur or potentially occurring in the project study area by searching the California Natural Diversity Database[39] (CNDDB) for records within a 5-mile radius of the project site, and the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants[40] for records within the *San Rafael* U.S. Geological Survey (USGS) 7.5-minute quadrangle. For the purpose of this report, special-status species are defined as follows:

- Species that are listed, formally proposed for listing, or designated as candidates for listing as threatened or endangered under the federal Endangered Species Act (ESA);
- Species that are listed, or designated as candidates for listing, as rare, threatened, or endangered under the California Endangered Species Act (CESA);
- Plant species on California Rare Plant Rank (CRP) Lists 1A, 1B, and 2 in the CNPS Inventory of Rare and Endangered Plants;
- Animal species designated as Species of Special Concern or Fully Protected by the California Department of Fish and Wildlife (CDFW);
- Species that meet the definition of rare, threatened, or endangered under Section 15380 of the CEQA guidelines; and
- Species considered being a taxon of special concern by the relevant local agencies.

LSA biologists Todd Catalini and Bernhard Warzecha conducted a reconnaissance-level survey of the project study area on February 25, 2015, and Bernhard Warzecha conducted a second reconnaissance-level survey on June 7, 2017. The surveys assessed the habitat conditions and the potential for those habitats to support special-status plant and animal species. Both sides of SFDB between Del Monte in Larkspur and Ahrens Lane in Ross were surveyed by foot. Basic information on plant communities and animal species were recorded in field notes. No focused tree, rare plant,

[39] California Department of Fish and Wildlife. 2017. *California Natural Diversity Database* (commercial version), Biogeographic Data Branch. April 1, 2017.

[40] California Native Plant Society. 2017. *Inventory of rare and endangered plants in California* (online edition, v7-09a). Website: www.cnps.org/inventory (accessed June 6, 2017).

or special-status animal surveys were conducted, nor was a formal jurisdictional delineation of waters of the United States conducted. Plant taxonomy and nomenclature in this chapter follows Baldwin et al.[41] Common and scientific names for special-status species or subspecies conform to the CNDDB[42]. Common and scientific names for fish, reptiles and amphibians, birds, and mammals conform to Nelson et al.[43], Crother[44], the American Ornithologists' Union (AOU) *Check-list of North American Birds*[45], and Baker et al.[46], respectively.

4.3.2 Setting

The project site is located within the Bay Area/Delta Bioregion, which encompasses the San Francisco Bay Area and the Sacramento-San Joaquin River Delta.[47] The Bay Area/Delta Bioregion extends from the Pacific Ocean to the Sacramento Valley and San Joaquin Valley bioregions to the northeast and southeast, and a short stretch of the eastern boundary joins the Sierra Bioregion at Amador and Calaveras Counties. The bioregion is bounded by the Klamath/North Coast Bioregion to the north and the Central Coast Bioregion to the south.

4.3.2.1 Land Cover Types

The project site comprises approximately 2.24 linear miles of SFDB with an approximate width of 120 feet, bounded on both sides by residential, commercial, and other urban development (Figure 3.2). The prevailing land cover types include developed, ornamental landscaping, and ruderal vegetation. Additionally, native and non-native street trees, tidal marsh, freshwater/brackish marsh, riparian habitat, and open water occur adjacent to or in the vicinity of SFDB. Vegetation types present within the project site and study area are described below. These descriptions are based on LSA's reconnaissance surveys of the study area, unless otherwise noted.

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41 Baldwin, B.G., et al., eds. 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. University of California Press, Berkeley.

42 California Department of Fish and Wildlife, 2017, op. cit.

43 Nelson, J.S., et al., eds. 2004. *A list of common and scientific names of fishes from the United States, Canada, and Mexico*. Sixth edition. American Fisheries Society Special Publication 20.

44 Crother, B.I., editor. 2012. *Scientific and standard English names of amphibians and reptiles of North America north of Mexico*. Society for the Study of Amphibians and Reptiles (SSAR) Herpetological Circular 39.

45 http://checklist.aou.org/.

46 Baker, R. J., et al. 2003. *Revised checklist of North American mammals north of Mexico, 2003*.

47 Welsh, H. 1994. Bioregions: An Ecological and Evolutionary Perspective and a Proposal for California. California Fish and Game (80) 3:97-124.

Developed and Landscaped Areas. Developed and landscaped areas include residential neighborhoods; commercial and industrial buildings; roads, including the median along SFDB; parking lots; neighborhood parks; and associated landscaping consisting of lawns and ornamental plantings. Trees and shrubs observed within these areas are primarily non-native ornamental species, including blue gum (*Eucalyptus globulus*), acacia (*Acacia* spp.), poplar (*Populus* spp.), olive (*Oleo europea*), oleander (*Nerium oleander*), pittosporum (*Pittosporum* sp.), and fruit trees (*Prunus* spp.).

Wildlife species that occur in developed and landscaped areas are able to use ornamental landscaping as foraging habitat and/or escape cover, and some are able to utilize building crevices, rooftops, and/or ledges on buildings for nesting and/or roosting. Common bird species likely to be found in the developed and landscaped areas include mourning dove (*Zenaida macroura*), rock pigeon (*Columba livia*), American crow (*Corvus brachyrhynchos*), European starling (*Sturnus vulgaris*), house finch (*Haemorhous mexicanus*), and house sparrow (*Passer domesticus*). Mammal species expected to occur in developed and landscaped areas include Virginia opossum (*Didelphis virginiana*), fox squirrel (*Sciurus niger*), Botta's pocket gopher (*Thomomys bottae*), and house mouse (*Mus musculus*). Several amphibians and reptile species can occur in developed habitats if suitable cover is present, particularly in residential areas or parks rather than industrial or commercial areas. These species include western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis* sp.), arboreal salamander (*Aneides lugubris*), and slender salamander (*Batrachoseps attenuatus*). Wildlife species observed within the developed and landscaped areas during the survey include cedar waxwing (*Bombycilla cedrorum*), American crow, and fox squirrel.

Trees. Densely vegetated areas consisting primarily of trees are located within the project right-of-way (ROW) and outside of the developed and landscaped areas. These vegetated areas consist of both non-native and native tree species. A few trees native to California that occur in these areas include California bay (*Umbellularia californica*), Monterey pine (*Pinus radiata*), Douglas fir (*Pseudotsuga menziesii*), coast live oak (*Quercus agrifolia*), and coast redwood (*Sequoia sempervirens*).

Some of the large trees within the project site may occasionally support bat species such as hoary bat (*Lasiurus cinereus*) (winter and migration only) and pallid bat (*Antrozous pallidus*); however, the likelihood of these occurrences is low due to the high levels of disturbance by motorized and pedestrian traffic along SFDB. Other larger trees such as eucalyptus and Douglas fir may provide nesting habitat for red-shouldered hawk (*Buteo lineatus*), Cooper's hawk (*Accipiter cooperii*), and downy woodpecker (*Picoides pubescens*). The densely vegetated tree areas observed within the project site are small and intermixed within the developed and landscaped areas and provide limited habitat value for special-status wildlife species. Most wildlife species that have the potential to occur in the tree areas are similar to those described for the developed and landscaped areas (above). However, common and potentially special-status bird species are more likely to nest in the areas with higher densities of trees.

Ruderal Vegetation. Ruderal (weedy) vegetation generally occurs directly adjacent to paved areas in small patches, where active landscaping is absent. Ruderal areas are dominated by non-native invasive grasses and forbs such as wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), Italian thistle (*Carduus pycnocephalus*), sweet fennel (*Foeniculum*

vulgare), broadleaf filaree (*Erodium botrys*), Italian ryegrass (*Festuca perennis*), common mallow (*Malva neglecta*), prickly ox-tongue (*Helminthotheca echioides*), cut-leaf plantain (*Plantago coronopus*), wild radish (*Raphanus sativus*), Himalayan blackberry (*Rubus armeniacus*), and Scotch broom (*Cytisus scoparius*). Patches of native species observed in this habitat include plant species such as California poppy (*Eschscholzia californica*), California buttercup (*Ranunculus californicus*), coyote brush (*Baccharis pilularis*), poison oak (*toxicodendrum diversilobum*), toyon (*Heteromeles arbutifolia*), and lupine (*Lupinus* sp.).

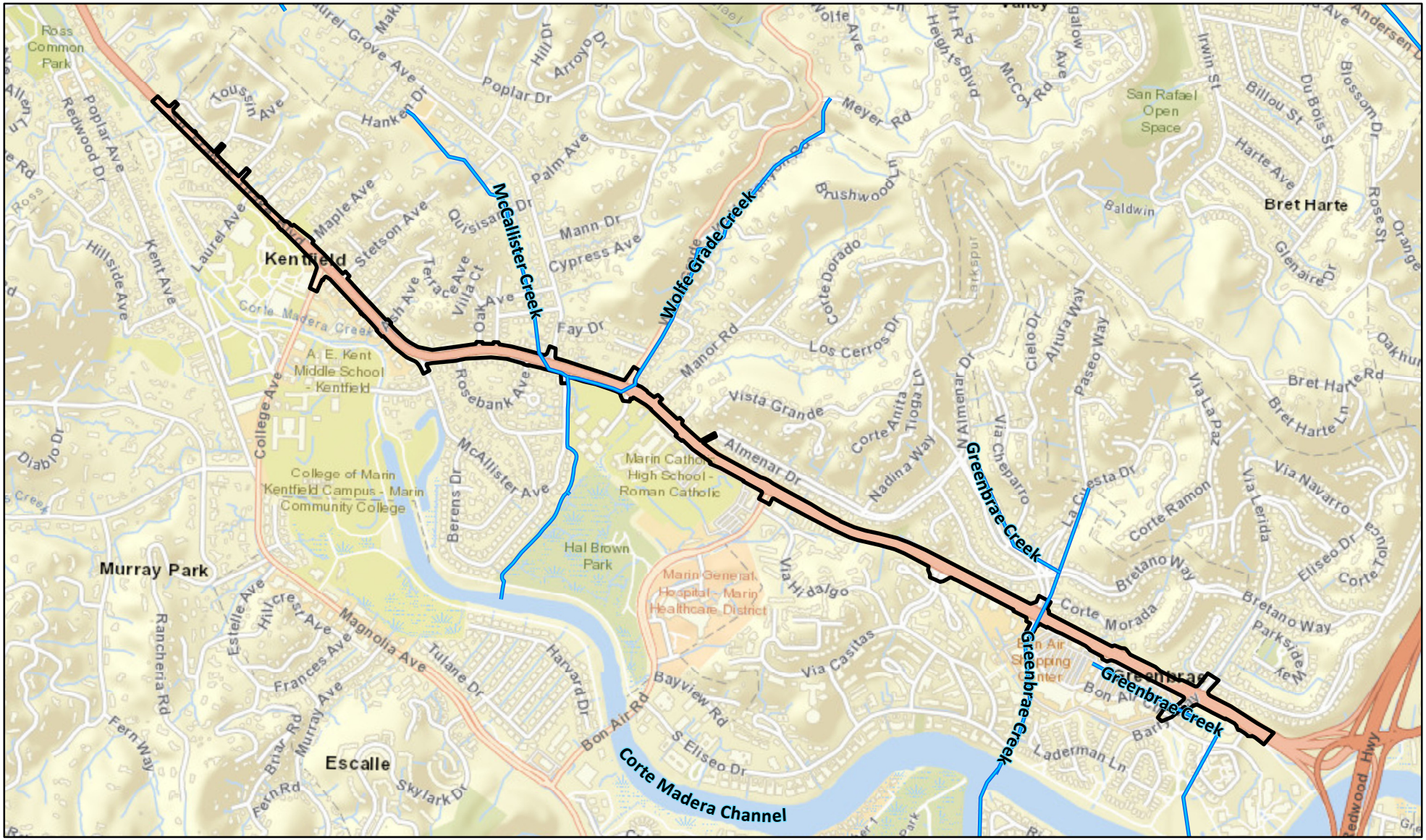
Areas with ruderal vegetation within the project site are small, isolated, and intermixed within the developed and landscaped areas. Accordingly, habitat value for these patches of ruderal vegetation would be considered marginal. Most wildlife species that have the potential to occur in the ruderal areas are similar to those described for the developed and landscaped areas (above). However, some ecological function is nevertheless provided by these small vegetated patches (e.g., support of insects which can be utilized by bird species and water retention).

Wolfe Grade Creek and Riparian Habitat. SFDB crosses Wolfe Grade Creek near the intersection of McAllister Avenue in Kentfield, directly adjacent to the Anthony J. Bacich Elementary School (Figure 4.3.1). This creek is confined to an underground culvert north of SFDB and daylights immediately to the south of the road shoulder. Where it daylights, the creek is approximately 8 feet wide at the ordinary high water mark and lacks any appreciable submerged or emergent vegetation. However, the creek does support dense herbaceous and woody cover along its banks. Overhead vegetation is dominated by willow (*Salix* sp.), ivy (*Hedera helix*, *Delairea odorata*), and acacia, intermixed with mostly ruderal understory species, such as white-flowered onion (*Allium triquetum*) and non-native grasses. At the time of the June 2017 survey, the creek held approximately 6 to 18 inches of water. Mallards (*Anas platyrhynchos*) were observed in the creek during the 2015 reconnaissance survey. The creek is connected via four culverts to Corte Madera Creek, located approximately 0.4 mile downstream of SFDB; Wolfe Grade Creek is connected to tidal marsh habitat approximately 0.2 mile downstream of SFDB. According to Marin County Geographical Information Systems (GIS) data[48], Wolfe Grade Creek and McAllister Creek merge underneath SFDB.

The open water of Wolfe Grade Creek supports urban-adapted waterfowl, such as mallards, and other urban-adapted plant and animal species. Additionally, special-status species such as California red-legged frog (CRLF; *Rana draytonii*) have a low potential to occur at the site. Many of the same wildlife species that occur in developed habitats may also occur in the Wolfe Grade Creek riparian corridor and other, more hydrophyllic plant species could also occur at the site. However, due to the disturbed nature, isolated character, and close proximity to the heavily used SFDB, this habitat is considered compromised and likely does not support special-status species.

Fish species known to occur in the Corte Madera Creek watershed, to which Wolfe Grade Creek is a tributary, include a variety of both native and introduced fish species. Native fish species known to occur in the watershed include steelhead (*Oncorhynchus mykiss*), Chinook salmon (*O. tshawytscha*), California roach (*Lavinia symmetricus*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), threespine stickleback (*Gasterosteus aculeatus*), longjaw mudsucker (*Gillichthys mirabilis*), staghorn sculpin (*Leptocottus armatus*), prickly sculpin

[48] Marin County. 2004. Community Development Agency. Stream Geographical Information Systems Layer.



LSA

LEGEND

Project Site

Stream Crossing

FIGURE 4.3.1

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0 625 1250

FEET

SOURCE: ESRI World Streetmap.

Sir Francis Drake Boulevard Rehabilitation Project
Marin County, California

Project and Stream Crossings

I:\BKF1501\GIS\Maps\EIR\Figure 4.3.1_Project and Stream Crossings.mxd (8/29/2017)

(*Cottus asper*), riffle sculpin (*Cottus gulosus*), starry flounder (*Platichthys stellatus*) and possibly Pacific lamprey (*Entosphenus tridentatus*).[49] Introduced species include common carp (*Cyprinus carpio*), rainwater killifish (*Lucania parva*), western mosquitofish (*Gambusia affinis*), and possibly black crappie (*Pomoxis nigromaculatus*). Coho salmon (*Oncorhynchus kisutch*), tule perch (*Hysterocarpus traskii*), and tidewater goby (*Eucyclogobius newberryi*) are considered extinct in the Corte Madera watershed. Corte Madera Creek runs parallel to the project corridor along SFDB, in some areas as close as 130 feet to SFDB. Corte Madera Creek is designated as critical habitat (San Pablo Bay hydrologic unit #18050002) and essential fish habitat for certain listed fish species (see Table 4.3.B). The aforementioned fish species may inhabit Wolfe Grade Creek, but the culverts downstream of the project site may act as a migration barrier.

Tidal Channels, Tidal Wetlands, and Brackish Wetland. No tidal channels, tidal wetlands, and brackish wetlands occur directly within the project site. However, a few of these habitats are located directly adjacent to the project site, and may receive runoff through the underground stormwater drainage system of SFDB.

Two tidal channels and associated tidal and brackish wetlands occur outside the project site adjacent to Highway 101 crossings with SFDB. Both channels may have underground tributaries via the stormwater drainage system that intersects the project site. One of these areas is located west of the Larkspur Ferry Terminal parking lot and may be mapped as Greenbrae Creek. This channel is a tributary to the Corte Madera channel. The other tidal channel is located south of SFDB and west of Highway 101. Both tidal channels support typical salt or brackish marsh vegetation, such as pickleweed (*Salicornia virginica*) and alkali heath (*Frankenia salina*).

A brackish wetland is located between two SFDB lanes and a Highway 101 on-ramp. This wetland supports the aforementioned salt marsh plants and freshwater/brackish plants, such as cattails (*Typha* sp.) and sedges (*Carex* sp.). This wetland is directly adjacent to, but outside of, the project site.

The tidal channels and associated brackish to saline wetland vegetation adjacent to SFDB provide marginal habitat for wetland species due to the high level of disturbance and degradation, and their isolated and fragmented character. However, vegetation cover resembles vegetation communities of more intact tidal/brackish marshes, which naturally are a highly productive community consisting of salt-tolerant, hydrophytic plants that form moderate to dense cover. Plants are usually segregated vertically depending on their tolerance of inundation and saline soils. This habitat type is typically associated with and occurs adjacent to intertidal mudflats that are devoid of vegetation; during an ebb tide, the bottoms of the channels contain bare mud, cobble, or rock. Under specific circumstances, this plant community and adjacent vegetated uplands within 30 meters of the channels can support special-status species, such as Ridgway's rail (*Rallus longirostris*), California black rail (*Laterallus jamaicensis*), and salt marsh harvest mouse (SMHM; *Reithrodontomys raviventris*). However, due to the location and disturbed condition of the wetlands near the site

[49] Leidy, R.A. 2007. *Ecology, Assemblage Structure, Distribution, and Status of Fishes in Streams Tributary to the San Francisco Estuary, California*. San Francisco Estuary Institute Contribution No. 530. San Francisco Estuary Institute, Oakland, California.

(specifically the isolated brackish wetland), the potential for these species to occur within the project site is low.

Freshwater Wetland. One potentially jurisdictional freshwater wetland is located within the project site. This potential wetland consists of a 45-foot-long by 1-foot-wide artificial roadside ditch along 34 Corte Morada in the community of Greenbrae. Vegetation in this ditch is currently dominated by facultative wetland plant species, including tall flat sedge (*Cyperus eragrostis*) and rabbit's-foot grass (*Polypogon monspeliensis*).

A freshwater wetland is located directly adjacent to the project area below a culvert outfall in a drainage swale south of the Highway 101 southbound on-ramp, approximately 300 feet east of the project site boundary. This wetland drains easterly into a tidal wetland/channel (discussed above). This freshwater wetland supports willows, coast live oaks, and non-native trees. The bottom of the wetland swale consists of dense bulrush (*Scirpus* sp.) and cattails.

Many of the same wildlife species that occur in developed habitats may also occur in the freshwater wetland area. Additionally, special-status species such as CRLF have a low potential to occur. However, due to the disturbed nature, isolated character, and close proximity to the heavily used SFDB, this habitat is considered compromised. Nevertheless, the freshwater wetland could support common freshwater wetland associated plant and animal species.

4.3.2.2 Special-Status Species and Sensitive Habitats

Special-Status Plants. A total of 37 special-status plant species that occur within a 5-mile radius of the project site or within the USGS San Rafael quadrangle were evaluated for their potential to occur on the project site (Table 4.3.A). Suitable habitat is present within the project site for some of these special-status plants, but most of these species are unlikely to occur due to the high level of disturbance, dominant cover of non-native plant species, and the area's urban setting.

Special-Status Animals. Based on a review of the CNDDB and other sources listed below, LSA identified 24 special-status animal species known to occur or potentially occurring in the vicinity of the project (Table 4.3.B). Some of these special-status species may occasionally pass through or forage within the project site but are not known or are not likely to breed within the project site. These species include Chinook salmon, golden eagle (*Aquila chrysaetos*), American peregrine falcon (*Falco peregrinus anatum*), and long-eared owl (*Asio otus*). One special-status animal listed on Table 4.3.B, Coho salmon, is considered extirpated from creeks within the project vicinity.

Table 4.3.A: Special-Status Plant Species Known to Occur or Potentially Occurring in the Vicinity of the Project Area

Species	Status*	Habitat/Blooming Period	Potential for Occurrence
Amorpha californica var. *napensis* Napa false indigo	1B	Openings in broadleafed upland forest, chaparral, cismontane woodland. April-July	Not likely to occur due to the absence of suitable habitat. CNDDB reports one occurrence from 1924 between Ross Valley and Phoenix Lake.
Arctostaphylos montana ssp. *Montana* Mt. Tamalpais Manzanita	1B	Chaparral, valley and foothill grassland/serpentinite, rocky. February-April	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. The CNDDB lists the closest occurrence (0.86 mile) at the King Mountain Loop Trail, King Mountain Open Space, Larkspur.
Arctostaphylos virgata Marin Manzanita	1B	Broadleafed upland forest, closed-cone coniferous forest, chaparral, North Coast coniferous forest on sandstone, or granitic substrates. January-March	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDB occurrence is approximately 1 mile from the project site.
Calamagrostis crassiglumis Thurber's reed grass	2	Coastal scrub (mesic), marshes and swamps (freshwater). April-May	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDB occurrence is approximately 2 miles from the project site on Mt. Tamalpais.
Calochortus tiburonensis Tiburon mariposa-lily	FT/ST/1B	Valley and foothill grassland (serpentinite). March-June	Not likely to occur due to the absence of suitable habitat. Closest CNDDB occurrence is approximately 2.2 miles from the project site, at the Ring Mountain Preserve.
Castilleja affinis ssp. *neglecta* Tiburon paintbrush	FE/ST/1B	Rocky serpentine sites in grasslands. April-June	Not likely to occur due to the absence of suitable habitat. Closest CNDDB occurrence is approximately 2.1 miles from the project site.
Ceanothus masonii Mason's ceanothus	1B	Chaparral (openings, rocky, serpentinite). March-June	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDB occurrence is approximately 4.2 miles from the project site on Mt. Tamalpais.
Chloropyron maritimum ssp. *palustre* Point Reyes bird's-beak	1B	Marshes and swamps (coastal salt), usually in coastal salt marsh with *Salicornia*, *Distichlis*, *Jaumea* and *Spartina*; 0-10 meters. June-October	Suitable habitat present within the tidal marsh habitat of the project site. Closest CNDDB occurrence is approximately 0.3 mile from the project site along the south bank of Corte Madera Creek, just south of the Greenbrae boardwalk.
Chorizanthe cuspidata var. *cuspidate* San Francisco Bay spineflower	1B	Sandy soil on terraces and slopes in coastal bluff, coastal dunes, coastal scrub, and coastal prairie habitat. April-July (August rarely)	Not likely to occur due to the absence of suitable habitat. Closest CNDDB occurrence is approximately 2 miles from the project site (1873).

Table 4.3.A: Special-Status Plant Species Known to Occur or Potentially Occurring in the Vicinity of the Project Area

Species	Status*	Habitat/Blooming Period	Potential for Occurrence
Cirsium hydrophilum var. *vaseyi* Mt. Tamalpais thistle	1B	Serpentine seeps and streams in chaparral and woodland. May-August	Not likely to occur due to the absence of suitable habitat. Closest CNDDB occurrence is approximately 2.7 miles from the project site.
Eriogonum luteolum var. *caninum* Tiburon buckwheat	1B	Serpentine soils; sandy to gravelly sites. May-September	Not likely to occur due to the absence of suitable habitat. Closest CNDDB occurrence is approximately 1 mile from the project site.
Fissidens pauperculus Minute pocket moss	1B	Moss growing on damp soil in coniferous forests along the coast; in dry streambeds and stream banks	Not likely to occur due to the absence of suitable habitat. No CNDDB records occur within 5 miles of the project site, but species is documented by CNPS within the *San Rafael* USGS Quadrangle.
Fritillaria lanceolata var. *tristulis* Marin checker lily	1B	Coastal bluff scrub, Coastal prairie, Coastal scrub. February-May	Not likely to occur due to the absence of suitable habitat. No CNDDB records occur within 5 miles of the project site, but species is documented by CNPS within the *San Rafael* USGS Quadrangle.
Gilia capitata ssp. *tomentosa* Woolly-headed gilia	1B	Serpentine, rocky, outcrops, Coastal bluff scrub, Valley and foothill grassland	Not likely to occur due to the absence of suitable habitat. No CNDDB records occur within 5 miles of the project site, but species is documented by CNPS within the *San Rafael* USGS Quadrangle.
Gillia millefolia Dark-eyed gilia	1B	Coastal dunes. April-July	Not likely to occur due to the absence of suitable habitat. Closest CNDDB occurrence is approximately 3.3 miles from the project site.
Helianthella castanea Diablo helianthella	1B	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. March-June	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDB record is a 1938 record from an unknown location in Mill Valley.
Hemizonia congesta ssp. *congesta* Congested-headed hayfield tarplant	1B	Valley and foothill grassland; sometimes roadsides. April-November	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDB occurrence is approximately 1.1 mile from the project site at Lake Lagunitas.
Hesperolinon congestum Marin western flax	FT/ST/1B	Serpentine barrens and serpentine grassland and chaparral. April-July	Not likely to occur due to the absence of suitable habitat. Closest CNDDB record is a 1880s record from an unknown location, approximately 0.8 mile from the project site in San Rafael.
Holocarpha macradenia Santa Cruz tarplant	FT/SE/1B	Light, sandy soil or sandy clay, often with non-natives in coastal prairie and grasslands. June-October	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDB record is an 1883 record from an unknown location in the vicinity of Ross.

Table 4.3.A: Special-Status Plant Species Known to Occur or Potentially Occurring in the Vicinity of the Project Area

Species	Status*	Habitat/Blooming Period	Potential for Occurrence
Horkelia tenuiloba Thin-lobed horkelia	1B	Broadleafed upland forest, chaparral, valley and foothill grassland on sandy soils, mesic openings. May-July	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDB record is approximately 2.5 miles from the project site.
Kopsiopsis hookeri Small groundcone	2	Open woods, shrubby places, generally on *Gaultheria shallon*. April-August	Not likely to occur due to the absence of suitable habitat. Closest CNDDB record is 1.4 miles from the project site.
Lessingia micradenia var. *micradenia* Tamalpais lessingia	1B	Usually on serpentine, in serpentine grassland or chaparral, often on roadsides. (June rarely) July-October	Not likely to occur due to the absence of suitable habitat. Closest CNDDB record is from a population last observed in 1960 from an unknown location at Phoenix Lake.
Microseris paludosa Marsh microseris	1B	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. April-June	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDB record is from an unknown location in Corte Madera.
Navarretia leucocephala ssp. *Bakeri* Baker's navarretia	1B	Mesic, cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. No CNDDB records occur within 5 miles of the project site, but species is documented by CNPS within the *San Rafael* USGS Quadrangle.
Navarretia rosulata Marin County navarretia	1B	Closed-cone coniferous forest and chaparral on serpentinite. May-July	Not likely to occur due to the absence of suitable habitat. Closest CNDDB occurrence is on Mount Tamalpais, approximately 3.1 miles from the project site.
Pentachaeta bellidiflora White-rayed pentachaeta	FE/SE/1A	Cismontane woodland, valley and foothill grassland on open, dry rocky slopes and grassy areas, often on serpentinite. March-May	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest extant CNDDB record is from a population last observed in 1912 at an unknown location at Bon Air Road Hill.
Plagiobothrys glaber Hairless popcorn-flower	1A	Coastal salt marshes, alkaline meadows, and seeps. March-May	Not likely to occur within the project site due to the small size of suitable tidal marsh habitat and the rarity of the species in the region. Closest CNDDB record is a 1924 record of a possibly extinct population, approximately 3.3 miles from the project site.
Pleuropogon hooverianus North Coast semaphore grass	SE	Wet grassy, usually shady areas, sometimes in freshwater marsh, associated with forest environments. April-June	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. No CNDDB records occur within 5 miles of the project site, but species is documented by CNPS within the *San Rafael* USGS Quadrangle.

Table 4.3.A: Special-Status Plant Species Known to Occur or Potentially Occurring in the Vicinity of the Project Area

Species	Status*	Habitat/Blooming Period	Potential for Occurrence
Quercus parvula var. *tamalpaisensis* Tamalpais oak	1B	Lower montane coniferous forest. March-April	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDB record is from an unknown location approximately 1.4 miles from the project site in Mill Valley.
Sidalcea calycosa ssp. *rhizomata* Point Reyes checkerbloom	1B	Freshwater marshes near the coast. April-September	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. No CNDDB records occur within 5 miles of the project site, but species is documented by CNPS within the *San Rafael* USGS Quadrangle.
Sidalcea hickmanii ssp. *viridis* Marin checkerbloom	1B	Chaparral, serpentine or volcanic soils; sometimes appears after burns. May-June	Not likely to occur due to the absence of suitable habitat. Closest CNDDB occurrence is approximately 4.5 miles from the project site.
Stebbinsoseris decipiens Santa Cruz microseris	1B	Broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland in open areas, sometimes on serpentinite. April-May	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation within the grasslands within the project site. Closest CNDDB record is approximately 3.5 miles from the project site.
Streptanthus batrachopus Tamalpais jewel-flower	1B	Closed-cone coniferous forest, chaparral, Talus serpentine outcrops. April-June	Not likely to occur due to the absence of suitable habitat. Closest CNDDB record is approximately 2.4 miles from the project site.
Streptanthus glandulosus ssp. *niger* Tiburon jewel-flower	FE/SE/1B	Shallow, rocky serpentine slopes in grasslands. May-June	Not likely to occur due to the absence of suitable habitat. Closest CNDDB record is approximately 4.2 miles from the project site.
Streptanthus glandulosus ssp. *pulchellus* Mount Tamalpais bristly jewel-flower	1B	Serpentine slopes. May-July (August rarely)	Not likely to occur due to the absence of suitable habitat. Closest CNDDB record is approximately 3.2 miles from the project site.
Trifolium amoenum Showy Rancheria clover	FE/1B	Coastal bluff scrub, valley and foothill grassland, sometimes on serpentinite. April-June	Not likely to occur within the project site due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDB record is approximately 0.7 mile from the project site.
Triquetrella californica Coastal triquetrella	1B	Coastal bluff scrub, coastal scrub. Moss.	Not likely to occur due to the absence of suitable habitat. Closest CNDDB record is approximately 2.6 miles from the project site.

Source: Compiled by LSA 2017. Nearest records are based on CNDDB (CDFW 2017) occurrences unless otherwise noted.

*Status:
FE = federally endangered
FT = federally threatened
SE = State endangered
ST = State threatened
1A = CRPR List 1A: Presumed extinct in California
1B = CRPR List 1B: Rare, threatened, or endangered in California and elsewhere
2 = CRPR List 2: Rare, threatened, or endangered in California, but more common elsewhere

Table 4.3.B: Special-Status Animal Species Known to Occur or Potentially Occurring within a 5 mile Radius of the Project Site

Species	Status*	Habitat	Potential for Occurrence within 5 miles of Project Area
Fish			
Oncorhynchus kisutch Coho salmon (Central California Coast Evolutionarily Significant Unit [ESU])	FE, SE	Coastal streams from Punta Gorda in northern California down to and including the San Lorenzo River in central California, as well as some tributaries to San Francisco Bay.	Not likely to occur. Species historically occurred in Corte Madera Creek but is considered extinct in the watershed. Species last recorded from San Francisco Bay tributary during early to mid-1980s. Corte Madera Creek is designated as critical habitat (San Pablo Bay hydrologic unit #18050002) and essential fish habitat for this species. The closest CNDDB occurrence is 3.6 miles from the project site.
Oncorhynchus tshawytscha Chinook salmon (Central Valley Spring-run ESU)	FT, ST	Requires clear, cool streams with pools and riffles, with coarse gravel beds for spawning, Sacramento River and its tributaries.	Known to occasionally occur in Corte Madera Creek, but fish may be of hatchery origin. Both native and hatchery fish may occur in the watershed.[1]
Oncorhynchus mykiss Steelhead (Central California Coast Distinct Population Segment [DPS])	FT	Coastal streams from Russian River south to Aptos Creek (Santa Cruz Co.), including streams tributary to San Francisco and San Pablo Bays.	Known to occur in Corte Madera Creek.[2] Corte Madera Creek is designated as critical habitat.
Invertebrates			
Callophrys mossii bayensis San Bruno Elfin butterfly	FE	Coastal, mountainous areas with grassy ground cover. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium*.	Unlikely to occur within project site due to lack of suitable habitat. The closest CNDDB record is near Alpine Lake, approximately 3 miles from project site.
Amphibians and Reptiles			
Rana draytonii California red-legged frog	FT, CSC	Ponds, streams, drainages and associated uplands; requires areas of deep, still, and/or slow-moving water for breeding.	Suitable habitat may be present in and along Wolfe Grade Creek. The closest CNDDB record is 4.3 miles from the project site.

1 Leidy, R.A., G.S. Becker, and B.N. Harvey, 2005. *Historical distribution and current status of steelhead/rainbow trout (Oncorhynchus mykiss) in streams of the San Francisco Estuary, California*. Center for Ecosystem and Restoration, Oakland, California.

2 Ibid.

Table 4.3.B: Special-Status Animal Species Known to Occur or Potentially Occurring within a 5 mile Radius of the Project Site

Species	Status*	Habitat	Potential for Occurrence within 5 miles of Project Area
Actinemys marmorata Western pond turtle	CSC	Ponds, streams with deep pools, drainages and associated uplands for egg laying.	May occur in Corte Madera Creek and the freshwater/brackish tributaries where suitable basking sites (sandy banks and rocks) are present, including Wolfe Grade Creek. The CNDDB lists occurrence of this species at Phoenix Lake, approximately 1.5 miles from the project site.
Dicamptodon ensatus California giant salamander	CSC	Ponds, streams, drainages and associated uplands; requires areas of deep, still, and/or slow-moving water for breeding.	Suitable habitat may be present in the aforementioned freshwater wetland area and creek. The closest CNDDB record is 0.4 mile from the project site. This sighting is from 1954.
Birds			
Elanus leucurus White-tailed kite	CFP	Open grasslands, meadows, or marshes; requires dense-topped trees or shrubs for nesting and perching.	Suitable nesting and foraging habitat may be present within the project area. No CNDDB records occur within 5 miles of the project site.
Haliaeetus leucocephalus Bald eagle	SE, CFP	Ocean shorelines, lake margins, and rivers for both nesting and wintering; nests in large trees with open branches.	Known to occasionally forage along Corte Madera Creek during winter, but not likely to remain for long periods or breed within project site. Observed flying over Corte Madera Creek in December 2009 (LSA personal observation). No CNDDB records occur within 5 miles of the project site.
Laterallus jamaicensis coturniculus California black rail	FT, CFP	Salt marshes bordering larger bays; also found in brackish and freshwater marshes.	May occur in tidal marsh habitats south of the Larkspur Ferry Terminal parking lot. Closest CNDDB record is approximately 0.1 mile from project site.
Rallus obsoletus Ridgway's rail (California clapper rail)	FE, SE, CFP	Tidal salt marshes with sloughs and substantial cordgrass (*Spartina* sp.) cover.	May occur in tidal marsh habitats south of the Larkspur Ferry Terminal parking lot; known to occur at the Corte Madera Marsh State Ecological Reserve, approximately 840 feet south of the project site.
Athene cunicularia Burrowing owl	CSC	Open, dry grasslands that contain abundant ground squirrel burrows.	May forage and migrate through the project site, but not likely to breed or winter in the area due to the lack of suitable habitat. Considered a rare breeder in Marin County.[1]

[1] Shuford, W.D., 1993, op. cit.

Table 4.3.B: Special-Status Animal Species Known to Occur or Potentially Occurring within a 5 mile Radius of the Project Site

Species	Status*	Habitat	Potential for Occurrence within 5 miles of Project Area
Asio otus Long-eared owl	CSC	Conifer, oak, riparian, pinyon-juniper, and desert woodlands adjacent to grasslands, meadows, or shrublands.	May pass through or winter in the woodland habitat within the project site. Not likely to nest within the project site due to the small size of woodland habitat and the area's urban setting.
Contopus cooperi Olive-sided flycatcher	CSC	Coniferous forests with open canopies.	Not likely to occur within the project site due to the small number of coniferous trees and the area's urban setting.
Lanius ludovicianus Loggerhead shrike	CSC	Open grasslands and woodlands with scattered shrubs, fence posts, utility lines, or other perches; nests in dense shrubs and lower branches of trees.	Suitable foraging and nesting habitat present within the ruderal/grassland habitat within the project site.
Progne subis Purple martin	CSC	Woodlands; nests in tree snags and abandoned woodpecker cavities and human-made structures.	May forage over the project site, but not likely to nest due to the lack of suitable habitat.
Geothlypis trichas sinuosa San Francisco (salt marsh) common yellowthroat	CSC	Salt, brackish, and freshwater marshes; and riparian woodlands; nests on or near ground in low vegetation.	Suitable breeding and/or foraging habitat may be present in the tidal marsh and freshwater/brackish marsh habitat near the project site.
Passerculus sandwichensis alaudinus Bryant's savannah sparrow	CSC	Tidal marshes and adjacent ruderal habitat, moist grasslands in the coastal fog belt, and infrequently, drier grasslands farther inland; in South Bay, nests primarily on levee tops overgrown with annual grasses and levee banks dominated by pickleweed.	May forage and breed in tidal marsh habitat adjacent to project site.
Strix occidentalis caurina Northern spotted owl	FT/CSC	Old-growth forests or mixed stands of old growth and mature trees.	May fly over project site, but not likely to breed directly along the project site due to its urban setting. The closest CNDDB record of a breeding pair is approximately 0.23 mile northeast from the project site, at San Rafael Open Space.

Table 4.3.B: Special-Status Animal Species Known to Occur or Potentially Occurring within a 5 mile Radius of the Project Site

Species	Status*	Habitat	Potential for Occurrence within 5 miles of Project Area
Melospiza melodia samuelis San Pablo (Samuels) song sparrow	CSC	Tidal salt marshes dominated by pickleweed; nests primarily in pickleweed and marsh gumplant.	Known to occur in marshes adjacent to the mouth of Corte Madera Creek; likely occurs in other tidal marsh habitats close to the project site. Detected in the tidal marsh south of the Larkspur Ferry Terminal parking lot and in the tidal channels north of Corte Madera Creek (LSA personal observation).
Agelaius tricolor Tricolored blackbird	CSC	Nests in dense vegetation near open water; forages in grasslands and agricultural fields.	May forage in grasslands during nonbreeding season, but not likely to breed within project site due to lack of large stands of freshwater marsh.
Mammals			
Antrozous pallidus Pallid bat	CSC	Tree cavities, but also utilizes man-made structures.	Unlikely to occur within project site due to high level of disturbance. Pallid bats could roost in tree cavities along SFDB, and may forage in the riparian vegetation of Wolfe Grade Creek. CNDDB occurrences recorded from the general vicinity of Ross.
Corynorhinus townsendii Townsend's big-eared bat	CSC	Caves, or spacious cavern-like structures.	Unlikely to occur within project site due to lack of suitable habitat. Closest CNDDB occurrences recorded 4.3 miles from the project site.
Reithrodontomys raviventris Salt marsh harvest mouse	FE, SE, CFP	Tidal salt marshes of San Francisco Bay and its tributaries. Requires tall, dense pickleweed for cover.	Suitable habitat present in tidal marshes on and adjacent to the project site, but lack of adjacent upland refugia likely precludes presence. Closest CNDDB occurrence is south of the project site within the Corte Madera Marsh State Ecological Reserve.

*Status:
FE = federally endangered
FT = federally threatened
SE = State endangered
ST = State threatened
CSC = California Species of Special Concern
CFP = California Fully Protected Species

Source: Compiled by LSA 2017. Nearest records are based on CNDDB (CDFW 2017) occurrences unless otherwise noted.

4.3.2.3 Sensitive Habitats

Special Plant Communities. The CDFW tracks the occurrences of "special" plant communities that are either known or believed to be of high priority for inventory in the CNDDB. These plant communities are listed in the CDFW publication *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database*.[53] These communities are sometimes addressed by lead or trustee agencies in CEQA documents but generally are not afforded the same protection as RPR List 1B and 2 plant species. Many special plant communities support special-status plants and animals and are addressed under CEQA as habitat for those species.

The following special plant communities occur within a 5-mile radius of the project site: serpentine bunchgrass, northern coastal salt marsh, coastal brackish marsh, and coastal terrace prairie. Of these special plant communities, only brackish marsh is confirmed to occur within the project site. Northern coastal salt marsh is dominated by native halophytes and usually supports an abundance of native forbs and potentially supports special-status plants. This community occurs along the northern shoreline of Corte Madera Creek, and also occurs near the project site along Greenbrae Creek, adjacent to the Marin Ferry Terminal parking lot; however, this community is not located within the SFDB right-of-way.

Wildlife Movement Corridors. Wildlife movement includes migration (i.e., usually one way per season), inter-population movement (i.e., long-term genetic flow), and small travel pathways (i.e., daily movement corridors within an animal's territory). While small travel pathways usually facilitate movement for daily home range activities such as foraging or escape from predators, they also provide connection between outlying populations and the main corridor, permitting an increase in gene flow among populations.

Because of the densely developed areas on both sides of SFDB and the substantial utilization of SFDB by motorized traffic throughout the project site, the extent of terrestrial or amphibian wildlife movement is limited.

4.3.2.4 Potential Jurisdictional Waters and Other Hydrological Features

Wetlands and other waters observed within the project site are likely to be jurisdictional under Section 404 of the federal Clean Water Act as well as jurisdictional waters of the State of California under the Porter-Cologne Water Quality Control Act. These features are listed below:

1. Wolfe Grade Creek daylighting at the intersection of SFDB and (West) McAllister Avenue in Kentfield. This Creek probably merges with McAllister Creek underneath SFDB.

2. McAllister Creek, which crosses SFDB underground at Wolfe Grade and follows SFDB for approximately 500 feet east underground, until it drains into the box culvert for Wolfe Grade Creek underneath SFDB.

[53] California Department of Fish and Wildlife. 2003. *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database*. Wildlife and Habitat Data Analysis Branch, Vegetation Classification and Mapping Program, California Department of Fish and Game, Sacramento.

3. Several drop inlets and culverts tributary to Corte Madera Creek.
4. A concrete v-ditch along the top of a 5-foot-tall retaining wall that extends parallel northwest along SFDB from Oak Avenue.
5. An open drainage ditch perpendicular to SFDB at 714 SFDB.
6. An open drainage ditch and drop inlet parallel to SFDB at 14 Corte Los Sombras, Greenbrae.
7. Two culverts and an open ditch dominated by wetland vegetation parallel to SFDB at 34 Corte Morada, Greenbrae.

No formal jurisdictional delineation has been conducted at the site.

4.3.3 Regulatory Framework

A large number of plans, policies, and regulations apply to biological resources on and in the vicinity of the project site. Starting at the federal level followed by State, regional, and local levels, this regulatory context is described below.

4.3.3.1 Applicable Federal Laws and Regulations

The following federal laws and regulations apply to the proposed project.

Federal Endangered Species Act (ESA). The United States Fish and Wildlife Service (USFWS) has jurisdiction over terrestrial and freshwater species that are formally listed as Threatened or Endangered under the federal ESA. The National Marine Fisheries Service (NMFS) has jurisdiction over listed marine species, which include anadromous fish such as salmon.

The ESA protects listed wildlife species from harm or “take.” The term “take” is broadly defined as to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” An activity is defined as a “take” even if it is unintentional or accidental. An Endangered plant or wildlife species is one that is considered in danger of becoming extinct throughout all, or a significant portion, of its range. A Threatened species is one that is likely to become endangered within the foreseeable future. In addition to Endangered and Threatened species, legally protected under the federal ESA, the USFWS has a list of proposed and candidate species. Proposed species are those for which a proposed rule to list them as Endangered or Threatened has been published in the Federal Record. A candidate species is one for which the USFWS currently has enough information to support a proposal to list it as a Threatened or Endangered species. These latter species are not afforded legal protection under the federal ESA. Nonetheless, project-related impacts to federally listed, proposed, and candidate species or their habitats are considered “significant” under *CEQA Guidelines* (discussed below).

Critical habitat is defined under the ESA as a specific geographic area(s) within a listed species’ range that contains features considered essential for the conservation of the listed species. Designated critical habitat for a given species may not necessarily be currently occupied by that species, if it is

within the historic range of the species and supports habitat deemed by the USFWS to be important for the recovery of the species. Critical habitat designation applies only to federal actions or actions funded or permitted by federal agencies. If a federal action or an action allowed by federal funding or a federal permit has the potential to adversely affect critical habitat for a listed species, the responsible federal agency is required to consult with the USFWS or NMFS. Corte Madera Creek is designated critical habitat for Central California Coast coho salmon ESU and Central California Coast steelhead ESU, but this creek occurs outside of the project site boundary.

Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The National Oceanic and Atmospheric Administration Marine Fisheries Service (NOAA Fisheries or NMFS) is responsible for managing Essential Fish Habitat (EFH) as designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). EFH is broadly defined to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," and requires Fishery Management Councils (FMC) to describe and identify the essential habitat for the managed species, minimize to the extent practicable adverse effects on EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of EFH. The MSFCMA also establishes measures to protect EFH. NMFS must coordinate with other federal agencies to conserve and enhance EFH, and federal agencies must consult with NOAA on all actions or proposed actions authorized, funded, or undertaken by the agency that may adversely affect EFH. In turn NOAA must provide recommendations to federal and state agencies (including CDFW and the Regional Water Quality Control Board [RWQCB]) on such activities to conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency.

Clean Water Act. Under Section 404 of the Clean Water Act (CWA), the United States Army Corps of Engineers (Corps) is responsible for regulating the discharge of fill material into waters of the U.S. Waters of the United States (U.S.) and their lateral limits are defined in 33 Code of Federal Regulations (CFR) Part 328.3(a) and include streams that are tributary to navigable waters and their adjacent wetlands. Wetlands that are not adjacent to waters of the U.S. are termed “isolated wetlands” and may not be subject to Corps jurisdiction.

In general, a Corps permit must be obtained before placing fill in wetlands or other waters of the U.S. The type of permit required depends on the amount of acreage and the purpose of the proposed fill, and is subject to discretion from the Corps. The two categories of Corps permits are: nationwide (general) permits and individual permits. To qualify for a nationwide permit, a project must demonstrate that it has no more than a minimal adverse effect on an aquatic ecosystem. The Corps typically interprets this condition to mean that there will be no net loss of either habitat acreage or habitat value. This usually results in the need to provide mitigation for project-related fill of any waters of the U.S.

An individual permit is required where a nationwide permit is not applicable. The consideration of an individual permit includes, but is not limited to, factors such as significant acreage of wetlands or waters of the U.S., areas of high or unique biological value, or length of watercourse affected. Individual permits require review of the project by the public, evidence that wetland impacts have been avoided or minimized to the extent possible, and provision of appropriate compensatory mitigation for unavoidable impacts.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act (16 USC 703) prohibits the taking, hunting, killing, selling, purchasing, etc. of migratory birds, parts of migratory birds, or their eggs and nests. In addition, it contains a clause that prohibits baiting or poisoning of these birds. As used in this act, the term "take" is defined as meaning, "to pursue, hunt, shoot, capture, collect, kill, or attempt to pursue, hunt, shoot, capture, collect, or kill, unless the context otherwise requires." Most of the native bird species that occur in the vicinity of the project study area are covered by this act.

4.3.3.2 Applicable State Laws and Regulations

The following State laws and regulations apply to the proposed project.

California Endangered Species Act. The CDFW has jurisdiction over state-listed Rare plants, and Threatened and Endangered plant and animal species under the California Endangered Species Act. In addition, its provisions protect species proposed for listing under the State Act.

California Department of Fish and Wildlife Species of Special Concern. The CDFW also maintains informal lists of "species of special concern." These species are broadly defined as plants and animals that are of concern to CDFW because of population declines and restricted distributions, and/or they are associated with habitats that are declining in California. Project-related impacts to species of special concern are considered "significant" under *CEQA Guidelines* (discussed below).

California Department of Fish and Game Code. The following sections of the Fish and Game Code apply to the proposed project:

- *California Fully Protected and Protected Species.* California fully protected and protected species may not be taken or possessed without a permit from the Fish and Game Commission and/or the CDFW. These take permits do not allow "incidental take," except in limited circumstances, and are more restrictive than the take allowed under Section 2081 for the California Endangered Species Act. Information on fully protected species can be found in the Fish and Game Code (birds at Section 3511, mammals at Section 4700, reptiles and amphibians at Section 5050, and fish at Section 5515). Information on protected (as opposed to fully protected) amphibians can be found in Chapter 5, Section 41; protected (as opposed to fully protected) reptiles at Chapter 5, Section 42.

- *California Fish and Game Code Sections 3503, 3503.5, and 3513.* The Fish and Game Code (cited sections) protects the nests and eggs of birds, including raptors (Falconiformes and Strigiformes) and the migratory bird species protected under the Migratory Bird Treaty Act.

- *California Fish and Game Code Section 1600.* The CDFW also administers the issuance of Streambed Alteration Agreements under the Fish and Game Code Section 1600. Streambed Alteration Agreements are required any time project activities would substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated as such by CDFW.

Section 401 Water Quality Certification. Pursuant to Section 401 of the federal CWA, projects that require a permit from the Corps under Section 404 must also obtain Water Quality Certification

from the RWQCB. This regulatory program is administered by one of nine Regional Boards depending on project location. The RWQCB has adopted a policy requiring mitigation for any loss of wetland, streambed, or jurisdictional area.

Porter-Cologne Water Quality Act. Wetlands and other waters may also be subject to regulation by the State under the Porter-Cologne Water Quality Act. The RWQCB has provisionally agreed to use published federal CWA criteria to define the extent of State Waters. State jurisdiction, however, is ultimately determined by the RWQCB and may differ from CWA jurisdiction at their discretion. One clear difference is that RWQCB jurisdiction under the Porter-Cologne Water Quality Act extends to isolated waters.

CEQA Guidelines Section 15380. Although Threatened and Endangered species are protected by specific federal and State statutes, *CEQA Guidelines* Section 15380(b) provides that a species not listed on the federal or State list of protected species may be considered Rare or Endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the federal Endangered Species Act and the section of the California Fish and Game Code dealing with Rare or Endangered species. Section 15380 (b) was included in the guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on a species that has not yet been listed by either the USFWS or CDFW. Thus, CEQA provides a lead agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted. The California Native Plant Society (CNPS), a non-governmental conservation organization, has developed lists of plants of special concern in California. A CNPS List 1A plant is a species, subspecies, or variety that is considered to be extinct. A List 1B plant is considered Rare, Threatened, or Endangered in California and elsewhere. A List 2 plant is considered Rare, Threatened, or Endangered in California but is more common elsewhere. A List 3 plant is a species for which CNPS lacks necessary information to determine if it should be assigned to a list or not. A List 4 plant has a limited distribution in California.

All of the plant species on List 1 and List 2 meet the requirements of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the Fish and Game Code, and are eligible for State listing. Therefore, plants appearing on Lists 1 or 2 are considered to meet CEQA's Section 15380 criteria and effects to these species are considered "significant" in this document.

4.3.3.3 Marin County

Marin Countywide Plan. The Marin CWP is a comprehensive plan for the development and use of land in the County and is an expression of community values. The Marin CWP was adopted by the Board of Supervisors on November 6, 2007. The CWP serves as the comprehensive guide for making decisions about land use, economic development, road improvements, and protection of natural resources and public health and safety. It also provides the legal foundation for all zoning, subdivision and public facilities ordinances, decisions, and projects.

Policies throughout the CWP emphasize the value of protecting and preserving the natural resources of the County. Policies relevant to the biological resources of the project site include:

Goal BIO-1: Enhanced Native Habitat and Biodiversity. Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.

Policy BIO-1.1: Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife Nursery Areas and Movement Corridors. Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local and resource agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.

Policy BIO-1.3: Protect Woodlands, Forests, and Tree Resources. Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas. See also Policy SV-1.7.

Goal BIO-2: Protection of Sensitive Biological Resources. Require identification of sensitive biological resources and commitment to adequate protection and mitigation, and monitor development trends and resource preservation efforts.

Policy BIO-2.1: Include Resource Preservation in Environmental Review. Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving “no net loss” of sensitive habitat acreage, values, and function.

Policy BIO-2.2: Limit Development Impacts. Restrict or modify proposed development in areas that contain essential habitat for special-status species, sensitive natural communities, wetlands, baylands and coastal habitat, and riparian habitats, as necessary to ensure the continued health and survival of these species and sensitive areas. Development projects should preferably be modified to avoid impacts to sensitive resources, or to adequately mitigate impacts by providing on-site or (as a lowest priority) off-site replacement at a higher ratio.

Policy BIO-2.3: Preserve Ecotones. Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the margins of riparian corridors, baylands and marshlands, vernal pools, and woodlands and forests where they transition to grasslands and other habitat types.

Policy BIO-2.4: Protect Wildlife Nursery Areas and Movement Corridors. Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits,

including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.

Policy BIO-2.5: Restrict Disturbance in Sensitive Habitat During Nesting Season. Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional where development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.

Policy BIO-2.6: Identify Opportunities for Safe Wildlife Movement. Ensure that existing stream channels and riparian corridors continue to provide for wildlife movement at roadway crossings, preferably through the use of bridges, or through over-sized culverts, while maintaining or restoring a natural channel bottom. Consider the need for wildlife movement in designing and expanding major roadways and other barriers in the county. Of particular concern is the possible widening of Highway 101 north of Novato to the county line, where maintenance of movement opportunities for terrestrial wildlife between the undeveloped habitat on Mount Burdell and the marshlands along the Petaluma River is critical.

Policy BIO-2.8: Coordinate with Trustee Agencies. Consult with trustee agencies (the California Department of Fish and Game, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, U.S. Army Corps of Engineers, Environmental Protection Agency, Regional Water Quality Control Board, and Bay Conservation and Development Commission) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected.

Policy BIO-2.9: Promote Early Consultation with Other Agencies. Require applicants to consult with all agencies with review authority for projects in areas supporting wetlands and special-status species at the outset of project planning.

> *Program BIO-2.a: Require Site Assessments.* Require site assessment by a qualified professional for development applications that may adversely affect sensitive biological or wetland resources, including jurisdictional wetlands, occurrences of special-status species, occurrences of sensitive natural communities, and important wildlife nursery areas and movement corridors. The assessment should determine the presence or absence of any sensitive resources that could be affected by development, evaluate the potential impacts, and identify measures for protecting the resource and surrounding habitat. Require the assessment to be conducted by a qualified professional paid for by the applicant. Unless waived, the qualified professional should be hired directly by Marin County.

Goal BIO-3: Wetland Conservation. Require all feasible measures to avoid and minimize potential adverse impacts to existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.

Policy BIO-3.1: Protect Wetlands. Require development to avoid wetland areas so that the existing wetlands and upland buffers are preserved and opportunities for enhancement are retained (areas within setbacks may contain significant resource values similar to those within wetlands and also provide a transitional protection zone).

Establish a Wetland Conservation Area (WCA) for jurisdictional wetlands to be retained, which includes the protected wetland and associated buffer area. Development shall be set back a minimum distance to protect the wetland and provide an upland buffer. Larger setback standards may apply to wetlands supporting special-status species or associated with riparian systems and baylands under tidal influence, given the importance of protecting the larger ecosystems for these habitat types as called for under Stream Conservation and Baylands Conservation policies defined in Policy BIO-4.1 and BIO-5.1, respectively. Regardless of parcel size, a site assessment is required either where incursion into a WCA is proposed or where full compliance with all WCA criteria would not be met. Employ the following criteria when evaluating development projects that may impact wetland areas:

City-Centered Corridor:

1. For parcels more than 2 acres in size, a minimum 100-foot development setback from wetlands is required.

2. For parcels between 2 and 0.5 acres in size, a minimum 50-foot development setback from wetlands is required. For parcels more than 2 acres, a minimum setback distance of 100 feet from jurisdictional wetlands is required.

3. For parcels between 2 and 0.5 acres in size, a minimum setback distance of 50 feet from jurisdictional wetlands is required.

4. For parcels less than 0.5 acres in size, a minimum setback distance of 20 feet is required.

5. An additional setback distance may be required, based on the results of a site assessment, if such an assessment is determined to be necessary. Site assessments will be required and conducted pursuant to program BIO-3.c, Require Site Assessment.

6. Regardless of parcel size, a site assessment is required either where incursion into a WCA is proposed or where full compliance with all WCA criteria would not be met.

Policy BIO-3.2: Require Thorough Mitigation. Where avoidance of wetlands is not possible, require provision of replacement habitat on-site through restoration and/or habitat creation at a minimum ratio of 2 acres for each acre lost (2:1 replacement ratio) for on-site mitigation and a minimum 3:1 replacement ratio for off-site mitigation. Mitigation wetlands should be of the same type as those

lost and provide habitat for the species that use the existing wetland. Mitigation should also be required for incursion within the minimum WCA setback/transition zone.

Program Bio-3.b: Comply with Regulations to Protect Wetlands. Continue to require development applications to include the submittal of a wetland delineation for sites with jurisdictional wetlands and to demonstrate compliance with these wetlands policies, standards, and criteria, and with State and federal regulations.

Program BIO-3.c: Require Site Assessment. Require development applications to include the submittal of a site assessment prepared by a qualified professional where incursions into the WCA are proposed, or adverse impacts to wetlands resources may otherwise occur. The assessment should be considered in determining whether any adverse direct or indirect impacts to wetlands would occur as a result of the proposed development, whether wetlands criteria and standards are being met, and to identify measures necessary to mitigate any significant impacts. The site assessment may also serve as a basis for the County to apply restrictions in addition to those required by State and federal regulations. The site assessment shall be paid for by the applicant. Unless waived, the qualified professional shall be hired directly by Marin County.

Goal BIO-4: Riparian Conservation. Protect and, where possible, restore the natural structure and function of riparian systems.

Policy BIO-4.1: Restrict Land Use in Stream Conservation Areas. A Stream Conservation Area (SCA) is established to protect the active channel, water quality and flood control functions, and associated fish and wildlife habitat values along streams. Development shall be set back to protect the stream and provide an upland buffer, which is important to protect significant resources that may be present and provides a transitional protection zone. Best management practices shall be adhered to in all designated SCAs. Best management practices are also strongly encouraged in ephemeral streams not defined as SCAs.

Exceptions to full compliance with all SCA criteria and standards may be allowed only if the following is true: 1) A parcel falls entirely within the SCA; or 2) Development on the parcel entirely outside the SCA either is infeasible or would have greater impacts to water quality, wildlife habitat, other sensitive biological resources, or other environmental constraints than development within the SCA. SCAs are designated along perennial, intermittent, and ephemeral streams as defined in the Countywide Plan Glossary. Regardless of parcel size, a site assessment is required where incursion into an SCA is proposed or where full compliance with all SCA criteria would not be met. An ephemeral stream is subject to the SCA policies if it: (a) supports riparian vegetation for a length of 100 feet or more, and/or (b) supports special-status species and/or a sensitive natural community type, such as native grasslands, regardless of the extent of riparian vegetation associated with the stream. For those ephemeral streams that do not meet these criteria, a minimum 20-foot development setback should be required.

SCAs consist of the watercourse itself between the tops of the banks and a strip of land extending laterally outward from the top of both banks to the widths. The SCA encompasses any jurisdictional wetland or unvegetated other waters within the stream channel, together with the adjacent

uplands, and supersedes setback standards defined for WCAs. Human-made flood control channels under tidal influence are subject to the Bayland Conservation policies. The following criteria shall be used to evaluate proposed development projects that may impact riparian areas:

City-Centered Corridor:

- For parcels more than 2 acres in size, provide a minimum 100-foot development setback on each side of the top of bank.
- For parcels between 2 and 0.5 acres in size, provide a minimum 50-foot development setback on each side of the top of bank.
- For parcels less than 0.5 acres in size, provide a minimum 20-foot development setback. The developed portion(s) of parcels (less than 0.5 acres in size) located behind an existing authorized flood control levee or dike are not subject to a development setback.
- Regardless of parcel size, an additional buffer may be required based on the results of a site assessment. A site assessment may be required to confirm the avoidance of woody riparian vegetation and to consider site constraints, presence of other sensitive biological resources, options for alternative mitigation, and determination of the precise setback. Site assessments will be required and conducted pursuant to Program BIO-4.g, Require Site Assessment.

Policy BIO-4.2: Comply with SCA Regulations. Implement established setback criteria for protection of SCAs through established discretionary permit review processes and/or through adoption of new ordinances. Environmental review shall be required where incursion into an SCA is proposed and a discretionary permit is required. In determining whether allowable uses are compatible with SCA regulations, development applications shall not be permitted if the project does any of the following:

- Adversely alters hydraulic capacity;
- Causes a net loss in habitat acreage, value, or function;
- Degrades water quality.

Policy BIO-4.4: Promote Natural Stream Channel Function. Retain and, where possible, restore the hydraulic capacity and natural functions of stream channels in SCAs. Discourage alteration of the bed or banks of the stream, including filling, grading, excavating, and installation of storm drains and culverts. When feasible, replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat, including through retention of large woody debris, except in cases where removal is essential to protect against property damage or prevent safety hazards. In no case shall alterations that create barriers to fish migration be allowed on streams mapped as historically supporting salmonids. Alteration of natural channels within SCAs for flood control should be designed and constructed in a manner that retains and protects the riparian vegetation, allows for sufficient capacity and natural channel migration, and allows for reestablishment of woody trees and shrubs

without compromising the flood flow capacity where avoidance of existing riparian vegetation is not possible.

Policy BIO-4.5: Restore and Stabilize Stream Channels. Pursue stream restoration and appropriate channel redesign where sufficient right-of-way exists that includes the following: a hydraulic design, a channel plan form, a composite channel cross-section that incorporates low flow and bankfull channels, removal and control of invasive exotic plant species, and biotechnical bank stabilization methods to promote quick establishment of riparian trees and other native vegetation.

Policy BIO-4.7: Protect Riparian Vegetation. Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.

Policy BIO-4.14: Reduce Road Impacts in SCAs. Locate new roads and roadfill slopes outside SCAs, except at stream crossings, and consolidate new road crossings wherever possible to minimize disturbance in the SCA. Require spoil from road construction to be deposited outside the SCA, and take special care to stabilize soil surfaces.

Policy BIO-4.15: Reduce Wet Weather Impacts. Ensure that development work adjacent to and potentially affecting SCAs is not done during the wet weather or when water is flowing through streams, except for emergency repairs, and that disturbed soils are stabilized and replanted, and areas where woody vegetation has been removed are replanted with suitable species before the beginning of the rainy season.

Policy BIO-4.20: Minimize Runoff. In order to decrease stormwater runoff, the feasibility of developing a peak stormwater management program shall be evaluated to provide mitigation opportunities such as removal of impervious surface or increased stormwater detention in the watershed.

Program BIO-4.f: Identify Potential Impacts to Riparian Systems. At the time of a development application, evaluate potential impacts to riparian vegetation and aquatic habitat, and incorporate measures to protect riparian systems into the project design and construction. Retain and minimize disturbance to woody and herbaceous riparian vegetation in SCAs and adjacent areas. Tree growth may be cleared from the stream channel where removal is essential to protect against property damage or prevent safety hazards.

Program BIO-4.g: Require Site Assessment. Require development applications to include the submittal of a site assessment prepared by a qualified professional where incursions into the SCA are proposed, or adverse impacts to riparian resources may otherwise occur. Unless waived, the qualified professional shall be hired by Marin County. The site assessment shall be paid for by the applicant and considered in determining whether any adverse direct or indirect impacts to riparian resources would occur as a result of the proposed development, whether SCA criteria and standards are being met, and to identify measures necessary to mitigate any significant impacts. The site assessment may also serve as a basis for the County to apply restrictions in addition to those required by State and federal regulations.

Program BIO-4.h: Comply with SCA Criteria and Standards. All development permit applications shall be reviewed for conformity with these SCA policies, criteria, and standards and in accordance with the California Environmental Quality Act. Proposals that do not conform to SCA policies, and cannot be modified or mitigated to conform, shall be denied. If a proposal involves the creation of a new parcel that is wholly or partially in an SCA, the land division shall be designed to ensure that no development occurs within the SCA.

Program BIO-4.p: Implement NPDES Phase II. Continue to implement NPDES Phase II permit requirements relating to peak flow controls to ensure that project related and cumulative impacts to peak flows are minimized or avoided through conditions on project approval as required by the ordinances.

4.3.3.4 City of Larkspur

City of Larkspur General Plan. The following policies and programs from the Larkspur's General Plan apply to the proposed project: [54]

Environmental Resources Element

Goal 1: Preserve and enhance a variety of open space features including ridgelines, the wetlands along the Bay and the creeks, wildlife habitats, view corridors, and other amenities which contribute to a sense of openness in Larkspur.

> *Action Program [7]: If a development proposal requires the removal of trees or other vegetation of significant resource value or adversely impacts a wetlands area (as defined in implementing ordinances), require the developer to replace the lost resources.*
>
> *Action Program [8]: Avoid development in areas which contain rare or endangered species of plants or animals.*

4.3.4 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, adopted policies, or regulations, or by the California Department of Fish and Game or United States Fish and Wildlife Service.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or United States Fish and Wildlife Service.

[54] City of Larkspur, 1990. *City of Larkspur, CA, General Plan*. http://www.ci.larkspur.ca.us/152/General-Plan. Accessed: June 16, 2017.

- Have a substantial adverse effect on federally or State protected wetlands as defined by Section 404 of the Clean Water Act or Porter-Cologne Water Quality Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

- Conflict with the provisions of an adopted Habitat Conservation Plan; Natural Community Conservation Plan; or other approved local, regional, or state habitat conservation plan.

- Substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or substantially reduce the number or restrict the range of an endangered, rare, or threatened species.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to biological resources if it would:

- Substantially reduce the number or restrict the range of a rare, endangered, or threatened plant or animal.

- Cause a fish or wildlife population to drop below self-sustaining levels.

- Adversely affect significant riparian lands, wetlands, marshes, and other significant wildlife habitats.

4.3.5 Impacts and Mitigation Measures

The following discussion analyzes impacts related to biological resources that could result from project implementation. All impacts will be less than significant with implementation of mitigation measures defined below.

(1) Special-status Species. As described in Section 4.3.1 above, special-status plant species are unlikely to occur due to the high level of disturbance, dominant cover of non-native plant species, and the area's urban setting. Therefore, no impacts to special-status plant species are anticipated and no mitigation is required.

Implementation of the proposed project could impact special-status wildlife, including nesting bird species protected under the MBTA and under Sections 355 and 356 of the California Fish and Game Code (including migratory birds and raptor species), salmonids, amphibians and reptiles, and roosting bats. Impacts to special-status wildlife are described below.

Impact BIO-1: Implementation of the proposed project could impact special-status bird species protected under the MBTA potentially nesting in and adjacent to the project site. (S)

Implementation of the proposed project could impact nesting special-status bird species located in the proposed project disturbance zone and adjacent areas. Implementation of the project could also impact common nesting bird species protected under the MBTA and under Sections 355 and 356 of the California Fish and Game Code (including migratory birds and raptor species).

Direct impacts to special-status and other protected bird nests could occur during removal of vegetation within the project disturbance zone. Removal of trees could also lead to the destruction of bird nests. Indirect impacts to nesting bird species could occur if bird species abandon active nest sites due to noise generated by construction activities or due to visual disturbance from construction workers and equipment.

No special-status bird species were observed nesting in the project study area during field surveys; however, they could establish active nest sites prior to implementation of the proposed project. Impacts to active nest sites could be a potential violation of the MBTA Sections 355 and 356 of the California Fish and Game Code, and therefore a significant impact.

> Mitigation Measure BIO-1: If construction work is scheduled during the breeding season (February through August), a qualified wildlife biologist shall conduct a pre-construction survey on and within 250 feet of the project site to determine if nesting birds are present. Pre-construction surveys shall not be required for construction work occurring during the non-breeding season from September through January. The pre-construction survey shall be conducted within 15 days prior to the start of work.
>
> If active nests are found in the work area, the biologist shall determine an appropriately-sized buffer around the nest in which no work shall be allowed until the young have successfully fledged or the nest is inactive. The size of the nest buffer shall be determined by the biologist and shall be based on the nesting species, the context of the nest site in relation to existing human activity and its sensitivity to disturbance, and the expected types of disturbance. No project construction activities shall be allowed to occur within this zone until a qualified biologist has determined that all juveniles have fledged from occupied nests or the nest is no longer active. (LTS)

Significance After Implementation. Implementation of Mitigation Measure BIO-1 will reduce project impacts to special-status and other protected bird species to ***less than significant***.

Impact BIO-2: Implementation of the proposed project could impact federal and/or state listed salmonid species - Central California Coastal coho salmon, Central California Coast steelhead, and California Coastal chinook salmon. (S)

The proposed project would not directly impact or result in "take" [55] of potentially present salmonids in Wolfe Grade Creek since no work is proposed in the creek channel or the box culvert. However, the proposed project has the potential to cause indirect impacts to salmonids as a result of the following construction-related activities: grading and other earthmoving; tree removal; culvert and drop inlets replacement work; construction equipment operation, maintenance, and storage; and fuel and other materials storage. Each of the potential impacts to salmonids from these construction activities is discussed below:

Impacts to salmonids due to temporary changes in the volume and timing of storm water runoff into Wolfe Grade Creek or Corte Madera Creek during construction. During the May 15 - October 15 period, salmonids in Corte Madera Creek and potentially in Wolfe Grade Creek are in the juvenile rearing and out-migration phases of their life cycles and are dependent on maintaining adequate baseflows in the creek. However, construction work under the proposed project is unlikely to affect Corte Madera Creek and Wolfe Grade Creek baseflows because the work would be limited to the May 15 - October 15 period when there is little or no rainfall. Changes to surface runoff from the project site during this period would be insufficient to appreciably influence stream flows. Therefore, the project's effects on the volume and timing of storm water runoff during the construction period would have a less-than-significant impact on salmonids in Corte Madera Creek and Wolfe Grade Creek.

Impacts to salmonids due to temporary water quality degradation in Corte Madera Creek and Wolfe Grade Creek during the construction period. In the absence of a properly implemented Storm Water Pollution Protection Plan (SWPPP), the proposed project would have the potential to cause significant adverse impacts to salmonids during construction due to runoff and/or direct discharges of contaminated water from the construction site. Contaminated runoff includes fine sediments, turbidity, metals, and other runoff-associated pollutants. Project construction would have the potential to discharge silt and sediment into Corte Madera Creek and Wolfe Grade Creek, and to cause high levels of turbidity. Project construction work could also result in the release of oil and grease, hydrocarbons, and metals. All these contaminants could adversely affect the water quality of spawning, rearing, feeding, and migration habitats downstream, which may impair salmonid egg incubation, rearing, feeding, respiration, or behavior. Inadvertent releases of fuels and other petroleum-based products and wet or uncured cement/concrete could be toxic to salmonids and other aquatic organisms.

Impacts to salmonids due to construction-related disturbance of riparian vegetation. Loss or damage to riparian vegetation associated with Wolfe Grade Creek could cause significant adverse impacts to salmonids by resulting in: new streamside erosion and associated sedimentation in the Corte Madera Creek and Wolfe Grade Creek, and loss of stream shading and associated water temperature increases in the creek.

> Mitigation Measure BIO-2: A SWPPP, in accordance with the State Water Resources Control Board, National Pollutant Discharge Elimination System (NPDES) Construction General Permit, shall be prepared and implemented. The SWPPP shall include a wide range of Best

[55] "Take" as defined under the ESA includes any activity that would harass, harm, trap, or kill a listed species.

Management Practices (BMPs) for controlling sediment and turbidity during construction. These BMPs should include the following measures to avoid impacts to salmonids:

- No fill material, including asphalt or concrete, shall be allowed to enter the stream. Any concrete structures (such as culvert headwall construction) below the tops of banks shall be poured in tightly sealed forms and shall not be allowed contact with surface waters until the cement has fully cured. Poured concrete shall be excluded from the wetted channel for a period of 30 days after it is poured. During that time the poured concrete shall be kept moist, and runoff from the concrete shall not be allowed to enter the creek. Commercial sealants may be applied to the poured concrete surface where difficulty in excluding water flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is dry and fully cured according to the manufacturer's specifications.
- No substances toxic to aquatic life shall be discharged into Wolfe Grade Creek or the stormwater drainage system of SFDB.
- Hydroseed mixes used to stabilize disturbed areas shall not contain fertilizers.
- Equipment maintenance and fueling areas shall be located at least 100 feet away from any creek bank. Fueling must be behind a containment barrier that shall prevent any spilled or leaked fuel from running into the creek. All equipment servicing must occur within designated areas. All motorized equipment used during construction or demolition activities shall be checked for oil, fuel, and coolant leaks prior to initiating work. Any equipment found to be leaking fluids shall not be used in or around aquatic habitat features in order to minimize the chances of contaminating the habitat and potentially impacting sensitive species, particularly salmon and steelhead.
- The project's contractor shall prepare an emergency response and clean-up plan prior to beginning work at the site. The plan shall detail the methods to be used to contain and clean up spills of petroleum products or other hazardous materials in the work area.
- All maintenance crew personnel shall receive environmental training about the sensitive nature of the special-status species in the project vicinity. This training shall include descriptions of the special-status species and all project measures in place to protect the species during construction. Crews shall also be informed to stop all work and notify their supervisor or the project biologist if special-status species are observed within the project site. (LTS)

Significance After Implementation. Implementation of Mitigation Measure BIO-2 will reduce project impacts to special-status fish species and designated critical habitat to ***less than significant***.

Impact BIO-3: Implementation of the proposed project could impact special-status amphibian and reptile species potentially present within the project area. (S)

No work will occur in the streambed or banks of Wolfe Grade Creek; however, the proposed project could indirectly impact individual western pond turtles, California red-legged frogs, and California giant salamanders, if present within the stream channel.

Implementation of the Best Management Practices described above in Mitigation Measure BIO-2 will prevent construction-related runoff from entering the channel and thus will preclude potential water quality impacts to western pond turtle, California red-legged frog, and California giant salamander. Therefore, with implementation of Mitigation Measure BIO-2, impacts to special-status amphibian and reptile species will be less than significant.

> Mitigation Measure BIO-3: Implement Mitigation Measure BIO-2, which requires preparation and implementation of a SWPPP that includes BMPs for controlling sediment and turbidity during construction.

Significance After Implementation. Implementation of these BMPs will prevent construction-related runoff from entering the channel and thus will preclude potential water quality impacts to western pond turtle, California red-legged frog, and California giant salamander. Implementation of Mitigation Measure BIO-2 will reduce potential impacts to amphibian and reptile species to ***less-than-significant*** levels.

Impact BIO-4: Implementation of the proposed project could impact special-status roosting bat species potentially present within the project area. (S)

Implementation of the proposed project could impact roosting and maternity sites for pallid bats and other bat species, if present. In particular, impacts to coast redwood and other trees could result in the removal of roosting and maternity sites. The removal of active roosting or maternity sites would be considered a significant impact.

> Mitigation Measure BIO-4a: All suitable roost trees to be removed within the project area shall be surveyed for the presence of bat roosts by a qualified biologist. Surveys may entail direct inspection of the trees or nocturnal surveys. The survey shall occur no more than two weeks prior to the initiation of vegetation removal and ground disturbing activities. If no roosting habitat is present, then the tree shall be removed within two weeks following the survey.
>
> If active bat roosts are present, a qualified biologist shall determine the species of bats present and the type of roost (i.e., day roost, night roost, maternity roost). If the biologist determines that the roosting bats are not a special-status species and the roost is not being used as a maternity roost, then the bats may be evicted from the roost using methods developed by a biologist experienced in developing and implementing bat mitigation and exclusion plans.
>
> Mitigation Measure BIO-4b: If special-status bat species are found to be present or if the roost is determined to be a maternity roost for any species of bat, then a qualified biologist experienced in developing bat mitigation and exclusion plans shall develop a mitigation plan to compensate for the lost roost site.
>
> Removal of the roost shall only occur when the mitigation plan has been approved by CDFW and only when bats are not present in the roost. The mitigation plan shall detail the methods of excluding bats from the roost and the plans for a replacement roost in the

vicinity of the project site. One replacement roost shall be provided for each roost impacted. The mitigation plan shall be submitted to CDFW for approval prior to implementation. The plan shall include: (1) a description of the species targeted for mitigation; (2) a description of the existing roost or roost sites; (3) methods to be used to exclude the bats if necessary; (4) methods to be used to secure the existing roost site to prevent its reuse prior to removal; (5) the location for a replacement roost structure; (6) design details for the construction of the replacement roost; (7) monitoring protocols for assessing replacement roost use; (8) a schedule for excluding bats, demolishing of the existing roost, and construction of the replacement roost; and (9) contingency measures to be implemented if the replacement roosts do not function as designed.

Mitigation Measure BIO-4c: Active bat roosts shall only be removed during seasons when bats are active and the young are able to fly (March 1 - April 15, and August 1 - October 15).

Mitigation Measure BIO-4d: Removal of trees surrounding roost trees shall be conducted in a manner to prevent the tree being removed from falling on or otherwise damaging the roost tree.

Mitigation Measure BIO-4e: No diesel or gas-powered equipment shall be stored or operated directly beneath a roost site.

Mitigation Measure BIO-4f: Under supervision of a qualified biologist, roost trees shall be removed in two steps, over two successive days:

1. Branches and limbs identified by the biologist should be removed on Day 1 (Disturbance).
2. The remainder of the tree should be removed on Day 2 (Removal).

Mitigation Measure BIO-4g: All construction activity in the vicinity of an active roost shall be limited to daylight hours. (LTS)

Significance After Implementation. Implementation of Mitigation Measures BIO-4a through BIO-4g will reduce potential impacts to special-status bat species to ***less-than-significant*** levels.

(2) Riparian Habitat. As described in Section 4.3.1 above, where Wolfe Grade Creek daylights, the creek supports dense herbaceous and woody cover along its banks, including willow, ivy, and acacia.

Impact BIO-5: Implementation of the proposed project would impact riparian habitat within the project area. (S)

The project may impact up to 2,000 square feet of riparian vegetation associated with Wolfe Grade Creek at the intersection of SFDB and McAllister Avenue. Permanent and temporary impacts to riparian habitat and vegetation would be considered a significant impact.

Mitigation Measure BIO-5a: Prior to construction, the County shall install protective fencing around and avoid excavating within the root zones of the willows and other riparian vegetation near the intersection of SFDB and McAllister Avenue. If impacts to the willows and riparian vegetation cannot be avoided, the County may need to obtain a Water Quality Certification permit from the RWQCB and/or a CDFW Streambed Alteration Agreement.

Mitigation Measure BIO-5b: If riparian plants, such as willows, are removed or impacted during construction, the impacted riparian plants shall be replaced at a 3:1 ratio, which is the standard mitigation ratio required by CDFW under a Streambed Alteration Agreement. Replacement willows shall be planted at a suitable location along Wolfe Grade Creek near SFDB. (LTS)

Significance After Implementation. Implementation of Mitigation Measures BIO-5a and BIO-5b would reduce impacts to riparian habitat in the project area to ***less-than-significant*** levels.

(3) Wetlands. The project would result in direct, permanent impact to approximately 45 square feet (0.001 acre) of a potentially jurisdictional roadside seasonal wetland ditch that would be filled and replaced with a concrete ditch or underground pipe as a result of road widening. This ditch is located approximately 700 feet east of La Cuesta Drive on the north side of SFDB.

Impact BIO-6: Implementation of the proposed project would impact seasonal wetlands and other waters present within the project area. (S)

On a seasonal basis when extended periods of inundations occur, the roadside seasonal wetland ditch may provide marginal habitat for aquatic invertebrates and amphibians, and feeding and foraging habitat for common wildlife species. However, the feeding and foraging value of this ditch is almost certainly diminished by its small extent, marginal quality, and its location in a highly urbanized area in close proximity to SFDB and associated vehicular traffic. This wetland may also provide limited water quality functions by detaining runoff and absorbing pollutants. However, the value of this function is limited since the ditch was not designed for this purpose (e.g., substrates not suitable, not physically designed to optimize detention).

Implementation of the project could also lead to the release of silt and sediment, turbidity, and other construction-related pollutants into areas adjacent to the construction zone, which could in turn drain into this ditch, thus indirectly impacting water quality and biota in this ditch and other wetlands and streams (see Impact BIO-2 for discussion of biological impacts and mitigation measures related to water quality).

Permanent and temporary impacts to wetland resources would be considered a significant impact. Implementation of the following three-part mitigation measure would reduce potential impacts to wetlands to less than significant:

Mitigation Measure BIO-6a: Prior to construction, a formal wetland delineation shall be prepared to determine the extent of fill to jurisdictional areas, including wetlands. If the U.S. Army Corps of Engineers determines that the seasonal wetland ditch is jurisdictional and the proposed project will impact the wetland ditch, Marin DPW shall obtain all required

regulatory permits to conduct work activities within the ditch. Permits that may be required include a Section 401 Water Quality Certification from the RWQCB, a Section 404 permit from the Corps, and a Lake and Streambed Alteration Agreement from CDFW. The County shall comply with all permit conditions, including providing mitigation for fill of jurisdictional areas.

Mitigation Measure BIO-6b: Prior to construction, Marin County shall provide mitigation for the loss of 45 square feet of seasonal wetlands associated with the filling of the potentially jurisdictional roadside wetland ditch by either establishing a new seasonal wetland ditch at a minimum 1:1 on-site replacement ratio within the vicinity of the SFDB project, applying a native wetland seed mix to a new or existing ditch, or enhancing a creek channel in the vicinity of the project. The 1:1 on-site replacement ratio would provide for no-net-loss of wetlands.

Mitigation Measure BIO-6c: During construction, Marin County shall implement all water quality protection measures contained in the SWPPP to prevent the direct and indirect release of soil and other construction materials into wetlands and streams. (LTS)

Significance After Implementation. Implementation of Mitigation Measures BIO-6a through BIO-6c would reduce impacts to seasonal wetlands and other waters in the project area to ***less-than-significant*** levels.

(4) Wildlife Movement Corridors. The term "corridor" as applied to wildlife habitat and movement has been defined in a variety of ways by ecologists, wildlife biologists, and landscape planners. For the purposes of this EIR, a corridor is defined as "any space, usually linear in shape that improves the ability of organisms to move among patches of their habitat."[56] In the San Francisco Bay Area, landscape elements that facilitate local and/or regional wildlife movement include stream drainages, canyons, ridges, or other prominent natural or man-made landscape features.

The proposed project will not substantially interfere with wildlife movement or corridors. Because of the densely developed areas on both sides of SFDB and the substantial utilization of SFDB by motorized traffic throughout the project site, the extent of terrestrial or amphibian wildlife movement is limited. Any animals that currently move through the site will continue to do so after the project is completed since most of the species that likely occur in the area are generalists that are adept at moving through urban landscapes. Therefore, impacts to wildlife movement corridors would be less than significant and no mitigation is required.

(5) Conflict with Local Plans or Policies. Trees that are protected by local and county tree ordinances including County of Marin ordinance #3342 (native tree protection ordinance), the Town of Ross Municipal Code Section 12.24.080(d) (replacement tree requirements), and the City of Larkspur ordinances 968, 906, 862, 877, and 772 (Tree Protections) may be impacted directly by project activities due to their close proximity to SFDB.

[56] Hilty, J. A., W. J. Lidicker, Jr., and A. M. Merenlender. 2006. Corridor ecology: The science and practice of linking landscapes for biodiversity conservation. Island Press, Washington, D.C.

Impact BIO-7: Implementation of the proposed project would impact native trees protected by the Marin County Tree Preservation Ordinance present within the project area. (S)

Relative to the large number of trees occurring along the SFDB corridor, the loss of trees could be locally significant and also require compensatory mitigation actions under the tree protection ordinances.

> Mitigation Measure BIO-7: The project shall comply with the requirements of the Marin County Tree Protection Ordinance, the Town of Ross Municipal Code Section 12.24.080(d) (replacement tree requirements), and the City of Larkspur ordinances 968, 906, 862, 877, and 772 (Tree Protections) for any tree loss under the proposed project. Consistent with the ordinances, trees of the same species as those impacted shall be replanted at a 3:1 replacement ratio. The replacement trees shall be 15-gallon specimens unless a certified arborist determines otherwise. Planted trees shall be maintained with browse protection and weed cloth around the root zones as needed, and regularly watered during the dry season until such time that a certified arborist has determined that they are sufficiently established to not require further maintenance or watering. (LTS)

Significance After Implementation. The implementation of Mitigation Measure BIO-7 will reduce the impacts of tree removal habitat loss to ***less-than-significant*** levels.

(6) Conflict with Conservation Policies or Plans. The project site is not subject to a Habitat Conservation Plan, Natural Community Conservation Plan, or any other habitat plan. Therefore, development of the proposed project would not conflict with any habitat conservation plan.

4.4 CULTURAL RESOURCES

This section describes existing conditions for cultural resources within the project vicinity, as well as potential impacts to those resources that could occur due to project implementation. The evaluation is based on review of existing documents, Native American contacts, and a field survey. Cultural resources are sites, buildings, structures, objects, and districts that may have traditional or cultural value due to their historical significance. The California Environmental Quality Act (CEQA) requires that agencies considering projects that are subject to discretionary action shall consider the potential impacts on cultural resources that may occur from project implementation (see Section 15064.5 and Appendix G of the CEQA Guidelines).

This section also describes (1) the pertinent state and local agency laws and regulations related to cultural resources; (2) potentially significant adverse impacts that could result from project implementation; and (3) mitigation measures to reduce these impacts to less-than-significant levels, as appropriate.

4.4.1 Setting

This section describes the methods used to establish the baseline conditions for cultural resources in the project corridor and vicinity; provides a brief overview of the pre-contact,[57] ethnographic, and historical contexts for the project area; describes the cultural resources identified in the vicinity of the project and their potential significance under CEQA; and presents the State and local legislative regulatory context for cultural resources.

4.4.1.1 Methods

A cultural resource records search of the project site was conducted on June 9, 2017, at the Northwest Information Center (NWIC) of the California Historical Resources Information System to identify previous cultural resources studies and site records for the project site and vicinity. The NWIC, an affiliate of the OHP, is the official State repository of cultural resource records and reports for Marin County. The search consisted of a review of records for built-environment resources within the project corridor and a review of recorded archaeological sites within 500 feet of the project corridor.

A review of the Sacred Lands File, on file at the Native American Heritage Commission (NAHC) in West Sacramento, was completed on June 12, 2017, for the project site and vicinity. The NAHC is a state agency responsible for maintaining the Sacred Lands File, which is a list of site locations that are of traditional, religious, and cultural importance to California Native American tribes.

Pursuant to Assembly Bill 52 (AB 52) (see Regulatory Framework discussion below), the County notified the Federated Indians of Graton Rancheria (FIGR) via a letter dated December 13, 2016, of the opportunity to consult regarding potential impacts from the project to tribal cultural resources.

[57] "Pre-contact," as used here, refers to Native American populations before the arrival of European and American colonists and settlers.

Geologic maps were reviewed to assess the potential for buried pre-contact archaeological deposits and fossil-bearing deposits in the project corridor. The University of California Museum of Paleontology (UCMP) online fossil database was also reviewed to assess the presence of fossil-bearing deposits underlying the project corridor.

On June 19, 2017, an LSA archaeologist conducted a pedestrian survey of previously unsurveyed segments of the project corridor. Visibility of native exposed soil was limited due to the presence of pavement, buildings, and landscaping. Areas of exposed soil in and immediately adjacent to the project corridor were visible in scattered places and were inspected for archaeological materials and midden soil.

4.4.1.2 Results

NWIC Database.A search of the NWIC database indicates that no built-environment resources are located within the project corridor; three archaeological cultural resources are recorded within 500 feet of the project corridor. The archaeological cultural resources recorded near the project corridor are described below.[58]

CA-MRN-75. Archaeologist Nels Nelson recorded CA-MRN-75 in 1907 as a pre-contact "shellground" north of Corte Madera Creek, 200-300 feet from the marsh. The exact location and current condition of CA-MRN-75 are not known, although mapping information provided by the NWIC indicates the site as either north or south of Sir Francis Drake Boulevard in the community of Greenbrae. Nelson indicated the dimensions of the site as 40-50 ft. in diameter.

CA-MRN-76. Archaeologist Nels Nelson recorded CA-MRN-76, the Greenbrae Mound, in 1907 as a pre-contact "shellmound" north of Corte Madera Creek at the edge of the marsh. Nelson estimated the site's dimensions as 100 x 150 ft. in diameter and 15 ft. high, indicating a substantial pre-contact occupation site.

In 1949, archaeologist Arnold Pilling prepared a supplemental record to Nelson's documentation for CA-MRN-76. Pilling's record mentions 19 human burials, ground stone artifacts, baked clay artifacts, shell ornaments, quartz crystals, a bone tool, and obsidian projectile points.

More recently, Archaeological Resource Service has conducted archaeological monitoring and mechanical trenching at, and in the vicinity of, CA-MRN-76 in 1989, 2001, 2006, and 2008-09. These monitoring and trenching efforts identified previously disturbed archaeological materials between 18 and 36 inches below the surface, with intact archaeological deposits below those depths. Human bone, numerous artifacts, and dietary remains (e.g., shell and animal bones) were identified.

CA-MRN-406. This pre-contact archaeological cultural resource is documented as a Native American village mound that measures approximately 170 meters (558 feet) by 100 meters (328

[58] The locations of archaeological cultural resources are confidential and the exact locations of sites mentioned in this section are not disclosed. The legal authority to restrict cultural resources information is in California Government Code Sections 6254(r) and 6254.10, and California Code of Regulations Section 15120(d).

feet). The site was first recorded by Jackson in 1972, who described it as north of Corte Madera Creek with "numerous artifacts and human remains recovered in the course of excavation." Excavations were conducted at CA-MRN-406 during the 1960s, which yielded human burials and numerous artifacts.

In addition, the NWIC indicates that there have been four previous cultural resource studies of the project corridor. These studies included pedestrian surveys to identify archaeological cultural resources and are summarized in Table 4.4.A below.

Table 4.4.A: Previous Cultural Resource Studies of the Project Corridor

Author (year)	Area of Project Subject to Survey	Findings
Desgrandchamp and Chavez (1984)[59]	La Cuesta Drive / SFDB intersection to Highway 101	No cultural resources identified in current project corridor
Pastron (2008)[60]	McAllister Avenue / SFDB intersection to Del Monte / SFDB intersection	No cultural resources identified in current project corridor
Roop (1991)[61]	Laurel Avenue / SFDB intersection to College Avenue / SFDB intersection; La Cuesta Drive / SFDB intersection to Highway 101	No cultural resources identified in current project corridor
Roop (1993)[62]	McAllister Avenue / SFDB intersection to Highway 101	No cultural resources identified in current project corridor

Source: NWIC.

NAHC and Tribal Cultural Resources. On June 12, 2017, the NAHC responded that a search of the Sacred Lands File for the project had "negative results."

FIGR did not respond to the County's letter notification of the tribe's opportunity to consult—pursuant to AB 52—for the purpose of mitigating the project's potential impacts to tribal cultural resources.

Geologic Maps. Geologic mapping and a geotechnical study completed for the project indicates that the project corridor is situated on artificial fill, Holocene-age (~11,500 years B.P.) alluvial and colluvial deposits, Holocene-age Bay Mud, and Franciscan Complex rock. Holocene-age landforms were deposited in and along the project corridor as a result of stream channel terrace, channel, and floodplain environments; at the base of slopes as a result of gravitational or slope wash processes; and in the case of Bay Mud, as a result of sea level rise beginning in the Late Pleistocene and Early

[59] Desgrandchamp, Cindy, and David Chavez, 1984. *Archaeological Resources Evaluation for the Central Marin Sanitation Wastewater Transportation Facilities Improvement Project—Phase II, Marin County, California.* David Chavez, Consulting Archaeologist, Mill Valley, California.

[60] Pastron, Alan, 2008. *Limited Cultural Resources Evaluation for the Ross Valley Sanitation District Kentfield Forcemain Rehabilitation Project, Located in the City of Kentfield, Marin County, California.* Archeo-Tec, Oakland.

[61] Roop, William, 1991. *A Cultural Resources Evaluation of a Proposed Reclaimed Water Pipeline in the San Quentin Point, Corte Madera, Larkspur, Kentfield, and San Rafael Areas.* Archaeological Resource Service, Petaluma.

[62] Roop, William, 1993. *A Cultural Resources Evaluation of the Sir Francis Drake Boulevard Repaving and Drainage Improvement Project, Marin County, California*. Archaeological Resource Service, Petaluma.

Holocene. Since these Holocene-age landforms were deposited during the time of pre-contact occupation in the Bay Area, there is a potential that these surfaces overlie buried Native American archaeological cultural resources. Near the project corridor, for example, Middle and Late Holocene landforms have been identified at a depth of 11.5 to 13.1 feet below the modern surface during recent geoarchaeological testing, indicating a potential for buried archaeological cultural resources and human remains.[63]

Franciscan Complex, Cretaceous-age sandstone pre-dates human occupation of the region and, therefore, has no potential to contain archaeological deposits or human remains. However, this formation has paleontological sensitivity and has yielded significant vertebrate fossils, including marine reptiles and fish.

As reported in the geotechnical study prepared for the project "*The western portion of the project will likely encounter 10-feet of medium-stiff and medium-dense colluvial and alluvial deposits. Excavations near US 101, will likely encounter 0 to 10 feet of medium dense to dense fill underlain by either soft Bay Mud or weak to strong Franciscan Mélange and sandstone bedrock.*"[64] These conditions indicate a potential for buried archaeological cultural resources, human remains associated with these deposits, and fossils within the project corridor.

UCMP Fossil Locality Search. A search of the UCMP fossil database was done on May 11, 2017. The database search was used to determine if any fossil localities had been identified within or near the project corridor, or within Franciscan Complex bedrock in Marin County. The UCMP database indicates that the Franciscan Complex has produced fossils that include fish, marine reptiles, and bivalves. In Marin County, over 800 fossils have been collected. These specimens were primarily from the Pleistocene and Pliocene-aged Purisima, Drakes Bay, and Tomales Formations. None of these fossil bearing formations are mapped on or within 100 feet of the project corridor.

Field Survey. No archaeological materials were identified during the field survey. There is a potential for significant archaeological cultural resources and human remains to be buried under fill soil or otherwise obscured by landscaping or pavement in the project corridor.

4.4.1.3 Pre-Contact History and Ethnography of the Project and Vicinity

The Archaic-Emergent cultural sequence developed by Fredrickson,[65] recalibrated by Milliken et al.,[66] is commonly used to interpret the pre-contact occupation of the San Francisco Bay Area. The recalibrated sequence is broken into two broad periods: 1) the Archaic Period, consisting of the

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63 Kaijankoski, Philip, and Jack Meyer, 2011. *Extended Phase I Subsurface Geoarchaeological Investigation Report for the Central Marin Ferry Connection Project, Larkspur, Marin County, California*. Davis, CA: Far Western Anthropological Research Group, Inc.

64 Miller Engineering Group, 2017. *Geotechnical Investigation Report, Sir Francis Drake Boulevard MMWD Pipeline Replacement Project, Larkspur and Kentfield, California.*

65 Fredrickson, David A., 1974. Cultural Diversity in Early Central California: A View from the North Coast Ranges, *Journal of California Anthropology* 1:41-54.

66 Milliken, Randall et al., 2007. Punctuated Culture Change in the San Francisco Bay Area, in *California Prehistory: Colonization, Culture, and Complexity*, edited by T.L. Jones and K.A. Klar, pp. 99-123, Lanham, MD: Alta Mira Press.

Early Holocene Lower Archaic (8000-3500 cal B.C.), Middle Archaic (3500-500 cal B.C.), Initial Upper Archaic (500 cal B.C.-cal A.D. 430), and Late Upper Archaic (cal. A.D. 430-1050); and 2) the Emergent Period, consisting of the Lower Emergent Period (cal A.D. 1050-1550) and Terminal Late (or Upper Emergent) Period (cal. A.D. 1550-historic).

The oldest archaeological deposits in the San Francisco Bay Area have been identified at Los Vaqueros Reservoir, east of Mount Diablo in Contra Costa County. At Los Vaqueros, an Early Holocene component was identified at archaeological site CA-CCO-696, where charcoal associated with a milling slab was dated to 7920 cal. B.C. The sparse archaeological data from Bay Area Early Holocene sites suggest a generalized, mobile hunter-gatherer adaptation characterized by milling stone equipment and wide-stemmed and leaf-shaped projectile points. Beginning at around 3500 B.C., local archaeological assemblages include stylized shell beads (often associated with human burials), mortars and pestles, and structural remains. Collectively, these assemblages indicate increased sedentism, regional symbolic integration, and trade during the Middle Archaic. By the Initial Upper Archaic, a "major disruption in symbolic integration systems" occurred, as evidenced by stylistic changes in shell ornaments and mortuary patterns.[67] The use of mortars and pestles is widespread during this time, although millingslabs and handstones persist in some areas. At around A.D. 430, at the onset of the Late Upper Archaic, archaeological data indicate a westward expansion of "Meganos culture" traits into the Bay Area from the San Joaquin Delta. The Meganos culture is characterized in the archaeological record by dorsally extended burials,[68] often associated with abundant shell beads. The Emergent Period is characterized by introduction of the bow-and-arrow (as evidenced by arrow-sized projectile points), increasing social stratification found in grave goods, and introduction of the Kuksu cult, which unified several language groups around the Bay Area.

Locally, pre-contact archaeological cultural resources have been identified near the bay margin/tidal marshland and include midden deposits, black soil containing artifacts and subsistence debris indicative of intensive episodes of occupation. Nearby archaeological excavations at Native American sites provide evidence of occupation of southern Marin County dating from the Lower Archaic Period at De Silva Island, during the Middle Archaic in Larkspur,[69] during the Upper Archaic and Emergent periods at sites in San Rafael and Larkspur,[70] [71] and during the Spanish colonization.[72]

The project is in the ethnographic territory of the Coast Miwok, who occupied what are now Marin and southern Sonoma counties. The Coast Miwok language is subsumed under the Penutian

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67 Milliken et al., 2007:115.

68 Dorsal extension is a burial position in which the skeleton is found on its back with the legs extended and the arms lying along the sides of the body.

69 Schwitalla, Al W. and Christopher Powell, 2014. *Archaeological Data Recovery at CA-MRN-67, Larkspur, Marin County, California*. San Francisco: Holman & Associates Archaeological Consultants.

70 Bieling, David G., 2000. *Archaeological Investigations at CA-MRN-255/H, Larkspur, Marin County, California*. San Francisco: Holman & Associates.

71 Stewart, Suzanne B., 1999. *Archaeological Test Excavations at CA-MRN-644/H, San Rafael, Marin County, California*. Rohnert Park, CA: Anthropological Studies Center.

72 Schneider, Tsim Duncan, 2010. *Placing Refuge: Shell Mounds and the Archaeology of Colonial Encounters in the San Francisco Bay Area, California.* PhD dissertation, Department of Anthropology, University of California, Berkeley.

language stock and includes two dialects: Western, or Bodega, and Southern, or Marin, with Southern being further divided into valley and coast.

Coast Miwok territories were comprised of one or more land-holding groups that anthropologists refer to as "tribelets." The tribelet, a nearly universal characteristic throughout native California, consists of a principal village occupied year-round and a series of smaller hamlets and resource gathering and processing locations occupied intermittently or seasonally. Tribelet population ranged between 50 and 500 persons and was largely determined by the carrying capacity of a tribelet's territory.

The traditional Coast Miwok lifeway was severely disrupted due to introduced diseases, a declining birth rate, and the impact of the mission system. Coast Miwok were transformed from hunters and gatherers into agricultural laborers who lived at the missions. Later, because of the secularization of the missions by Mexico in 1834, most of the aboriginal population gradually moved to ranchos to work as manual laborers.

Today, many Coast Miwok people still live in their ancestral territory in Marin County and continue to engage in traditional cultural practices. The Federated Indians of Graton Rancheria (FIGR) are a federally recognized tribe consisting of both Coast Miwok and Southern Pomo (whose ancestral tribal territory is in northern Sonoma County). FIGR, established in 1992, provides members with economic and educational opportunities and seeks to preserve their traditional heritage.

4.4.1.4 History of the Project and Vicinity

The project corridor is within the boundary of Punta de Quentin Rancho, which was granted by Governor Juan B. Alvarado to John B.R. Cooper in 1840. The 8,877-acre grant included the San Quentin peninsula and the modern communities of Ross, Kentfield, and part of San Anselmo. In 1847, Cooper leased a portion of his rancho to the U.S. government for a sawmill operation, and in 1850 sold his rancho to Benjamin Buckelew. Buckelew sold a portion of his rancho on the tip of the peninsula to the State, which built a prison on the land where the San Quentin facility is today.

Historical maps indicate that early alignments of modern Sir Francis Drake Boulevard were established by at least the 1870s. The 1873 *Map of Marin County, California*, depicts a wagon road along the Corte Madera Slough, connecting the State prison at San Quentin Point with Ross Landing to the west. In 1897 the alignment of this wagon road was similar to modern Sir Francis Drake Boulevard. Although a few scattered buildings are shown near the wagon road on these maps, the project corridor was largely rural during the 19th century, with the nearest sizeable community located to the north in San Rafael.

By the mid-20th century, the project corridor was an established population center with services for the surrounding community. As depicted on the 1954 U.S. Geological Survey *San Rafael* quadrangle map, residences and institutional facilities, including Marin Jr. College, Marin High School, and Marin General Hospital were established. Sir Francis Drake Boulevard remains an important transportation corridor to the present day.

4.4.2 Regulatory Framework

4.4.2.1 Federal Regulations

Section 106 of the National Historic Preservation Act. If a project is subject to federal jurisdiction and the project is an undertaking as defined at 36 CFR §800.16(y) with the potential to cause effects on historic properties (36CFR §800.3(a)), Section 106 of the National Historic Preservation Act of 1966, as amended, must be addressed to take into account the effect of the undertaking on any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (National Register).

An historic property is any district, site, building, structure, or object listed in or eligible for listing in the National Register at the local, state, or national level (36 CFR §800.16(l)(1). The criteria for determining a resource's eligibility for National Register listing are defined at 36 CFR §60.4. The four evaluation criteria are applied to the property in which the property's significance for its association with important events or persons, importance in design or construction, or information potential is assessed. The criteria are as follows:

> . . .the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> B. That are associated with the lives of persons significant in our past; or
>
> C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D. That have yielded, or may be likely to yield, information important in prehistory or history.

In order to be eligible for the National Register, a cultural resource must retain historical integrity, which is the ability of a resource to convey its significance. The evaluation of integrity must be grounded in an understanding of a resource's physical features and its environment, and how these relate to its significance. A property conveys its significance through the retention of its aspects of integrity. Under Criteria A, B, and C, the National Register places an emphasis on a resource appearing like it did during its period of significance to convey historical significance; under Criterion D, properties convey significance through the information they contain. Resources that meet the age guidelines, are significant, and possess integrity will generally be considered eligible for listing in the National Register.

4.4.2.2 State Regulations

California Environmental Quality Act. CEQA applies to all discretionary projects undertaken or subject to approval by the state's public agencies (14 CCR Section 15002(i)). Under the provisions of CEQA, "A project with an effect that may cause a substantial adverse change in the significance of a

historical resource is a project that may have a significant effect on the environment" (14 CCR Section 15064.5(b)).

CEQA Guidelines Section 15064.5(a) defines a "historical resource" as a resource that meets one or more of the following criteria:

- Listed in, or eligible for listing in, the California Register of Historical Resources (as defined under California Public Resources Code [PRC], Section 5024.1; 14 CCR Section 4850, *et seq.*);
- Listed in a local register of historical resources (as defined at PRC Section 5020.1(k));
- Identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or
- Determined to be a historical resource by a project's lead agency (14 CCR Section 15064.5(a)).

A historical resource consists of "Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California…Generally, a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing in the California Register of Historical Resources" (14 CCR Section 15064.5(a)(3)).

If an impact on a historical or archaeological resource is significant, CEQA requires feasible measures to minimize the impact (14 CCR Section 15126.4 (a)(1)). Mitigation of significant impacts must lessen or eliminate the physical impact that the project would have on the resource. Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (Weeks and Grimmer, 1995) shall be considered mitigated to a level of a less-than-significant impact on the historical resource (14 CCR Section 15064.5(b)(3)). The use of drawings, photographs, and/or displays does not typically mitigate the physical impact on the environment caused by demolition or destruction of a historical resource. However, CEQA requires that all feasible mitigation be undertaken even if it does not mitigate impacts to less-than-significant levels (14 CCR Section 15126.4(a)(1)).

California Assembly Bill 52 (AB 52). Assembly Bill 52, which became law on January 1, 2015, provides for consultation with California Native American tribes during the CEQA process, and equates significant impacts to "tribal cultural resources" with significant environmental impacts. PRC Section 21074 states that "tribal cultural resources" are:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe and are one of the following:
    - Included or determined to be eligible for inclusion in the California Register of Historical Resources.

- Included in a local register of historical resources as defined in subdivision (k) of PRC Section 5020.1.
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

A "historical resource" (PRC Section 21084.1), a "unique archaeological resource" (PRC Section 21083.2(g)), or a "nonunique archaeological resource" (PRC Section 21083.2 (h)) may also be a tribal cultural resource if it is included or determined to be eligible for inclusion in the California Register.

The consultation provisions of the law require that a public agency consult with local Native American tribes that have requested placement on that agency's notification list for CEQA projects. Within 14 days of determining that a project application is complete, or a decision by a public agency to undertake a project, the lead agency must notify tribes of the opportunity to consult on the project, should a tribe have previously requested to be on the agency's notification list. California Native American tribes must be recognized by the NAHC as traditionally and culturally affiliated with the project site, and must have previously requested that the lead agency notify them of projects. Tribes have 30 days following notification of a project to request consultation with the lead agency.

The purpose of consultation is to inform the lead agency in its identification and determination of the significance of tribal cultural resources. If a project is determined to result in a significant impact on an identified tribal cultural resource, the consultation process must occur and conclude prior to adoption of a Negative Declaration or Mitigated Negative Declaration, or certification of an Environmental Impact Report (PRC Sections 21080.3.1, 21080.3.2, 21082.3).

California Public Resources Code Section 5097.98. Section 5097.98 of the California Public Resources Code states that the NAHC, upon notification of the discovery of Native American human remains pursuant to Health and Safety Code Section 7050.5 (discussed below), shall immediately notify those persons (i.e., the Most Likely Descendant or "MLD") it believes to be descended from the deceased. With permission of the landowner or a designated representative, the MLD may inspect the remains and any associated cultural materials and make recommendations for treatment or disposition of the remains and associated grave goods. The MLD shall provide recommendations or preferences for treatment of the remains and associated cultural materials within 48 hours of being granted access to the site.

California Health and Safety Code Section 7050.5. Section 7050.5 of the California Health and Safety Code states that, in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether or not the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the NAHC within 24 hours of this identification. The NAHC will identify a Native American MLD

to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods.

4.4.2.3 Marin County

Marin Countywide Plan. The Marin Countywide Plan promotes the identification and preservation of Marin County's historical and archaeological resources. Specifically, implementing programs HAR-1.1 through HAR-1.5 encourage the identification and documentation of archaeological and historical resources, promote avoidance of impacts to resources, encourage community involvement in preservation efforts, and encourage the regulation of modifications to historical structures and neighborhoods.

Marin County Municipal Code. Archaeological and historical resources are addressed in the County's Municipal Code. Relevant sections of the Municipal Code are:

- **Chapter 5.32 *et seq.*** Chapter 5.32 of the Municipal Code pertains to the excavation of "Indian Middens" and identifies permitting requirements for archaeological excavation of such sites.

- **Section 22.20.040.** In the event that archaeological or historic resources are discovered during any construction, construction activities shall cease, and the Agency shall be notified so that the extent and location of discovered materials may be recorded by a qualified archaeologist, and disposition of artifacts may occur in compliance with State and Federal law. The disturbance of an Indian midden may require the issuance of an Excavation Permit by the Department of Public Works, in compliance with Chapter 5.32 (Excavating Indian Middens) of the County Code.

4.4.2.4 City of Larkspur

City of Larkspur General Plan. The following policies and programs from the Larkspur's General Plan apply to the proposed project: [73]

<u>Community Character Element</u>

Goal 3: Assure the survival of Larkspur's special "sense of place."

Policy h: Encourage broad-based community interest in and support of preservation activities.

Policy i: Identify significant archaeological, historic, and natural resources representing all of the ethnic, cultural, and economic groups that have lived and worked in Larkspur.

Policy j: Safeguard and maintain significant historic, archaeological, and natural resources.

Goal 4: Promote a greater awareness of and sensitivity toward Larkspur's archaeological heritage.

[73] City of Larkspur, 1990. *City of Larkspur, CA, General Plan*. http://www.ci.larkspur.ca.us/152/General-Plan. Accessed: June 16, 2017.

Action Program [21]: All development applications and public projects that require EIRs will routinely be sent to the "California Archaeological Inventory – Northwest Information Center" (CAI) at the Department of Anthropology, Sonoma State University, for review and recommendations regarding archaeological findings.

Action Program [24]: Where an archaeological site is in proximity to a project under review, City staff in conjunction with CAI will determine the particular qualities to be preserved and the methods of preservation.

4.4.3 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5.
- Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to CEQA Guidelines Section 15064.5.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
- Disturb any human remains, including those interred outside of formal cemeteries.

The *CEQA Guidelines* defines a substantial adverse change as:

- Physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.
- Demolition or material alteration in an adverse manner of those physical characteristics of an historical resource which convey its historical significance and justify its inclusion in or eligibility for inclusion in the California Register of Historical Resources, inclusion in a local register, or identification in a historical resources survey.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact on cultural resources if it would:

- Affect federally or State-listed resources.
- Disrupt or adversely affect a prehistoric or archaeological site, or a property of historic or cultural significance to a community or ethnic or social group, or a paleontological site, except as part of a scientific study.
- Affect a local landmark of local cultural/historical importance.

4.4.4 Impacts and Mitigation Measures

The following describes the project's potential impacts to cultural resources. For the project to have "a substantial adverse change" on a historical resource, it would have to demolish, destroy, relocate, or alter the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired (CEQA Guidelines Section 15064.5(b)). Archaeological sites may qualify as historical resources under CEQA (CEQA Guidelines Section 15064.5(c)(1)).

Generally, for purposes of CEQA, the significance of a historical resource is materially impaired when a project demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the California Register or an officially recognized local register of historical resources, or its identification in a historical resources survey meeting the requirements of PRC Section 5024.1(g).

(1) Historical Resources. The project corridor—which is situated north of Corte Madera Creek and marshland—and general vicinity would have attracted Native American populations due to the resource rich environment, including local access to bay, creek, and oak woodland resources. No recorded historical resources are located within the project corridor. However, three archaeological sites have been identified in proximity to the project site and could be impacted by project activities.

<u>Impact CULT-1:</u> Project ground-disturbing activities could have a substantial adverse change on archaeological deposits that qualify as historical resources, as defined in CEQA Guidelines Section 15064.5, and could materially impair a pre-contact archaeological site. (S)

The general sensitivity of the project corridor for pre-contact archaeological cultural resources is supported by the background research conducted for this EIR, which identified three pre-contact archaeological sites within 500 feet of the project: CA-MRN-75, CA-MRN-76, and CA-MRN-406. Two of these sites, CA-MRN-76 and CA-MRN-406, are known to have yielded human skeletal remains and numerous artifacts and dietary debris. CA-MRN-76, in particular, is known to contain intact archaeological deposits that underlie pavement and disturbed soils.

Intact deposits associated with CA-MRN-76—or other intact archaeological cultural resources within the project corridor identified during project excavation—will qualify as historical resources under CEQA due to their eligibility for listing in the California Register of Historical Resources. Should project excavation unearth intact archaeological deposits, a substantial adverse change to a historical resource would occur due to the partial or complete destruction of the resource. This destruction would undermine the integrity of the resource such that it would no longer be eligible for listing in the CRHR.

> <u>Mitigation Measure CULT-1a:</u> All project ground disturbance within 500 feet of the Sir Francis Drake Boulevard / La Cuesta Drive intersection that is 18 inches below surface shall be monitored by an archaeologist. Monitoring shall continue at this location until the archaeologist determines that there is a low potential for subsurface archaeological

deposits. The archaeological monitoring shall be overseen by an archaeologist that meets or exceeds the Secretary of the Interior's Professional Qualifications Standards in archaeology.

Should an archaeological deposit be encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and the on-site archaeologist shall assess the deposit, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. The County shall be notified by the construction contractor within 24 hours of the encounter. If found to be significant by the on-site archaeologist (i.e., eligible for listing in the California Register of Historical Resources), the County shall be responsible for funding and overseeing implementation of appropriate mitigation measures. Mitigation measures may include, but would not be limited to, recording the archaeological deposit, data recovery and analysis, and public outreach. Upon completion of the selected mitigations, a report documenting methods, findings, and recommendations shall be prepared and submitted to the County for review, and the final report shall be submitted to the Northwest Information Center at Sonoma State University. Significant archaeological materials shall be submitted to an appropriate local curation facility and used for future research and public interpretive displays, as appropriate.

Mitigation Measure CULT-1b: Should an archaeological deposit be encountered during project subsurface construction activities when an archaeological monitor is not on site, all ground-disturbing activities within 25 feet shall be redirected and a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology contacted to assess the situation, determine if the deposit qualifies as a historical resource, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. If the deposit is found to be significant (i.e., eligible for listing in the California Register of Historical Resources), the County shall be responsible for funding and implementing appropriate mitigation measures. Mitigation measures may include recordation of the archaeological deposit, data recovery and analysis, and public outreach regarding the scientific and cultural importance of the discovery. Upon completion of the selected mitigations, a report documenting methods, findings, and recommendations shall be prepared and submitted to the County for review, and the final report shall be submitted to the Northwest Information Center at Sonoma State University. Significant archaeological materials shall be submitted to an appropriate local curation facility and used for future research and public interpretive displays, as appropriate.

The County shall inform its contractor(s) of the sensitivity of the project corridor for archaeological cultural resources and shall verify that the following directive has been included in the appropriate contract documents:

"The subsurface of the construction site may be sensitive for Native American archaeological deposits and associated human remains. If archaeological deposits are encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and a qualified archaeologist contacted to assess the situation, determine if the deposit qualifies as a historical resource, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. Project personnel shall not collect or move any archaeological materials. Archaeological deposits can include shellfish remains;

bones; flakes of, and tools made from, obsidian, chert, and basalt; and mortars and pestles. Contractor acknowledges and understands that excavation or removal of archaeological material is prohibited by law and constitutes a misdemeanor under California Public Resources Code, Section 5097.5." (LTS)

Significance After Implementation. Collectively, implementation of the above mitigation measures would reduce the project's potential impacts to archaeological historical resources to a less-than-significant level. On-site monitoring of ground disturbance by an archaeologist and work stoppage in the event of an archaeological discovery would ensure that: 1) if archaeological cultural resources are identified during excavation, these would be evaluated, documented, and studied in accordance with standard archaeological practice, and 2) archaeological deposits and human remains would be treated in accordance with appropriate State codes and regulations.

(2) Archaeological Resources. According to the CEQA Guidelines, "When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource" (CEQA Guidelines Section 15064.5(c)(1)). Those archaeological sites that do not qualify as historical resources shall be assessed to determine if these qualify as "unique archaeological resources" (California PRC Section 21083.2).

Impact CULT-2: Project ground-disturbing activities could cause a substantial adverse change in the significance of an archaeological resource, as defined in CEQA Guidelines Section 15064.5, and could materially impair a pre-contact archaeological site. (S)

Archaeological cultural resources identified during project construction shall be treated by the lead agency—in consultation with a qualified archaeologist meeting the *Secretary of the Interior's Professional Qualifications Standards for Archeology*—in accordance with Mitigation Measure CULT-1a and Mitigation Measure CULT-1b.

Mitigation Measure CULT-2: Implement Mitigation Measures CULT-1a and CULT-1b, which require on-site monitoring of ground disturbances within 500 feet of the Sir Francis Drake Boulevard / La Cuesta Drive intersection and work stoppage in the event of an archaeological discovery.

Significance After Implementation. With implementation of Mitigation Measures CULT-1a and CULT-1b, impacts to archaeological resources would be less than significant. On-site monitoring of ground disturbance by an archaeologist and work stoppage in the event of an archaeological discovery would ensure that: 1) if archaeological cultural resources are identified during excavation, these would be evaluated, documented, and studied in accordance with standard archaeological practice, and 2) archaeological deposits and human remains would be treated in accordance with appropriate State codes and regulations.

(3) Paleontological Resources. The Franciscan Complex is known to be fossiliferous, most notably for the microscopic single-celled organisms known as radiolaria, which comprise the distinctive red and green radiolarian cherts associated with the Franciscan Complex. Extinct species of vertebrate marine fossils and shellfish have also been found in the Franciscan Complex.

Impact CULT-3: Project ground-disturbing activities could directly or indirectly destroy a unique paleontological resource or site by unearthing or otherwise displacing fossils in Franciscan Complex bedrock that underlie the project corridor. (S)

The proposed project includes trenching for water line installation that may encounter Franciscan Complex bedrock. Should significant fossils be identified within this bedrock, their destruction or displacement would potentially result in a substantial adverse change to scientifically important specimens.

Mitigation Measure CULT-3: Should paleontological resources be encountered during project subsurface construction activities, all ground-disturbing activities within 25 feet shall be redirected and a qualified paleontologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. For purposes of this mitigation, a "qualified paleontologist" shall be an individual with the following qualifications: 1) a graduate degree in paleontology or geology and/or a person with a demonstrated publication record in peer-reviewed paleontological journals; 2) at least 2 years of professional experience related to paleontology; 3) proficiency in recognizing fossils in the field and determining their significance; 4) expertise in local geology, stratigraphy, and biostratigraphy; and 5) experience collecting vertebrate fossils in the field. If the paleontological resources are found to be significant and project activities cannot avoid them, measures shall be implemented to ensure that the project does not cause a substantial adverse change in the significance of the paleontological resource. Measures may include monitoring, recording the fossil locality, data recovery and analysis, a final report, and accessioning the fossil material and technical report to a paleontological repository. Upon completion of the assessment, a report documenting methods, findings, and recommendations shall be prepared and submitted to the County for review. If paleontological materials are recovered, this report also shall be submitted to a paleontological repository such as the University of California Museum of Paleontology, along with significant paleontological materials. Public educational outreach may also be appropriate.

The County shall inform its contractor(s) of the sensitivity of the project site for paleontological resources and shall verify that the following directive has been included in the appropriate contract documents:

"The subsurface of the construction site may be sensitive for fossils. If fossils are encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and a qualified paleontologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. Project personnel shall not collect or move any paleontological materials. Fossils can include plants and animals, and such trace fossil evidence of past life as tracks or plant imprints. Ancient marine sediments may contain invertebrate fossils such as snails, clam and oyster shells, sponges, and protozoa; and vertebrate fossils such as fish, whale, and sea lion bones. Contractor acknowledges and understands that excavation or removal of paleontological material is prohibited by law and constitutes a misdemeanor under California Public Resources Code, Section 5097.5." (LTS)

Significance After Implementation. With implementation of Mitigation Measure CULT-3, impacts to paleontological resources would be less than significant.

(4) Human Remains. Native American skeletal remains are often associated with habitation sites near the bayshore, and two archaeological cultural resources within 500 feet of the project corridor have yielded intact burials and disarticulated human bone in previously disturbed soils.

Impact CULT-4: Project ground-disturbing activities have the potential to unearth Native American human remains. (S)

Disturbance by the project of Native American remains interred outside of formal cemeteries would result in a significant impact. If human remains are identified during project construction, Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the Public Resources Code shall apply, as appropriate.

> Mitigation Measure CULT-4: If human remains are identified during construction and cannot be preserved in place, the County shall fund 1) the removal and documentation of the human remains from the project corridor by a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archaeology, 2) the scientific analysis of the remains by a qualified archaeologist, should such analysis be permitted by the Native American Most Likely Descendant, and 3) the reburial of the remains, as appropriate. All excavation, analysis, and reburial of Native American human remains shall be done in consultation with the Native American Most Likely Descendant, as identified by the California Native American Heritage Commission. (LTS)

Significance After Implementation. With implementation of Mitigation Measure CULT-4, impacts to human remains would be less than significant.

4.5 GEOLOGY AND SOILS

This section describes the geologic environment of the project area and assesses potential impacts from seismically induced fault rupture, strong ground shaking, liquefaction, slope failure, lateral slope deformation, differential settlement and unstable or expansive soils. A site-specific geotechnical investigation for the MMWD Pipeline Replacement[74] (Geotechnical Investigation) (Appendix F) explored and evaluated geologic and geotechnical soil conditions of the MMWD pipeline replacement area, including soil borings, in order to provide geotechnical conclusions and recommendations for the excavation and installation of the MMWD replacement pipeline. Information from the Geotechnical Investigation was considered in developing the site-specific setting, impact analysis and mitigation measures. Mitigation measures for the identified significant impacts are provided, as appropriate.

4.5.1 Setting

The following description of setting is based on published and unpublished geologic reports and maps from the United States Geological Survey (USGS), the California Geological Survey (CGS), Association of Bay Area Governments (ABAG), the County of Marin, and the site-specific geotechnical investigation.

4.5.1.1 Geology and Soils

The site is located within the Coast Ranges Geomorphic Province of California. The regional topography is characterized by northwest-southeast trending mountain ridges and intervening valleys that were formed by tectonic interaction between the North American and the Pacific Plates. Regional geologic mapping indicates the western portion is underlain by Quaternary alluvial and colluvial soil deposits, and sandstone and shale bedrock from the Cretaceous period. The eastern portion is underlain by artificial fill soils over Bay Mud, and Franciscan Mélange bedrock formation. Franciscan Mélange typically consists of a tectonic mixture of small to large masses of resistant rock types, predominately sandstone, greenstone, chert, and serpentine in a matrix of highly sheared and pulverized rock material.

The United States Natural Resources Conservation Service (NRCS) provides a database of historical soil classification and mapping information. The soils of the project area are mapped primarily as:[75]

- **Xerorthents-Urban land complex (0 to 9 percent slopes).** This soil type is located on valley floors, cut toe slopes, and tidelands or in bay areas covered with fill. Xerorthents consist of cut or fill areas, or both that vary greatly in depth and drainage. The fill areas consist of soil, gravel, broken cement, asphalt, rock, bay mud, and other material from urban construction. Urban land consists of areas covered by roads, driveways, houses, parking lots, and other structures.

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[74] Miller Pacific, 2017. Geotechnical Investigation Report Sir Francis Drake Boulevard MMWD Pipeline Replacement Project, Larkspur and Kentfield, California. 16 June.

[75] United States Department of Agriculture Soil Conservation Service, 1985. Soil Survey of Marin County California. Available online at: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/california/marinCA1985/marinCA1985.pdf. Accessed 6/19/17.

Beneath these structures are rock fragments and soil material similar to that of Xerorthents. Runoff is rapid and the hazard of water erosion is slight.

- **Tocaloma-McMullin-Urban land complex (15 to 30 percent slopes and 30 to 50 percent slopes).** These soils are moderately deep and shallow, well-drained, moderately steep to very steep soils underlain by sandstone and shale, and urban land. This soil type is located on hilly uplands. The Tocaloma soil is moderately deep and well drained, formed in material derived from sandstone and shale. Runoff is rapid and the hazard of water erosion is high. The McMullin soil is shallow and well-drained formed in material derived in sandstone. Runoff is rapid and the hazard of water erosion is high.

- **Los Osos-Urban land-Bonnydoon complex (15 to 30 percent slopes).** This soil type is located on hilly uplands. The Los Osos soil is moderately deep and well drained formed in material derived dominantly from sandstone or shale. Runoff is rapid and the hazard of water erosion is high. Urban land consists of areas covered by roads, driveways, houses, parking lots, and other structures. Beneath these structures is highly fractured, weathered rock mixed with soil material. Runoff is very rapid, and there is no hazard of water erosion. The Bonnydoon soil is shallow and somewhat excessively drained formed in material derived dominantly from sandstone and shale. Runoff is rapid and the hazard for water erosion is high.

The NRCS provided ratings of the soils of the area as low to high for shrink-swell potential, moderately erodible by water, having low corrosiveness to concrete, and as having low corrosiveness to steel.[76] In addition, the NRCS includes AASHTO suitability ratings for soils in the database, with soils rated as A-1 to A-3 to be 'excellent to good' and those rated as A-4 to A-6 as being 'fair to poor' as sub-grade for roadbeds. The Los Osos-Urban land-Bonnydoon complex and Tocaloma-McMullin-Urban land complex are rated as A-4, with the other soil types not rated. The Geotechnical Investigation notes that based on the 11 borings conducted for the investigation (all located within the area of the road bed), excavations for the project will likely encounter a variety of geologic materials. The western portion of the project would likely encounter 10 feet of medium stiff and medium dense colluvial and alluvial deposits. Excavations near Highway 101 will likely encounter 0 to 10 feet of medium dense to dense fill underlain by either soft Bay Mud or weak to strong Franciscan Mélange or sandstone bedrock.

4.5.1.2 Groundwater

Groundwater was encountered in two soil borings at depths of 5.5 and 6 feet during drilling. The remaining borings did not encounter groundwater. It is estimated that groundwater may be within 5 feet of the ground surface in lower-lying portions of the project area (such as near Highway 101 and Wolfe Grade). Groundwater in upland areas will likely be within 10 to 15 feet of the ground surface, and possibly shallower during the winter months or following periods of heavy rain.

The rate of groundwater infiltration will depend on material permeability, but dewatering will likely be required to maintain dry working conditions. Pumps should be used to control groundwater

[76] NRCS, 2016. Web Soil Survey, https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed 6/19/17.

seepage into excavations. Significant groundwater seepage can cause excavations to become unstable.

4.5.1.3 Mineral Resources

In 1987, the California Division of Mines and Geology (CDMG) (now the California Geological Survey [CGS]) published a comprehensive mineral land classification for aggregate materials in the San Francisco-Monterey Bay Area; this report was updated in 2013.[77] In the North San Francisco Bay Production-Consumption Region, lands were classified in the following categories:

- **MRZ-1:** Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- **MRZ-2:** Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists.
- **MRZ-3:** Areas containing mineral deposits the significance of which cannot be evaluated from available data.
- **MRZ-4:** Areas where available information is inadequate for assignment to any other MRZ category.

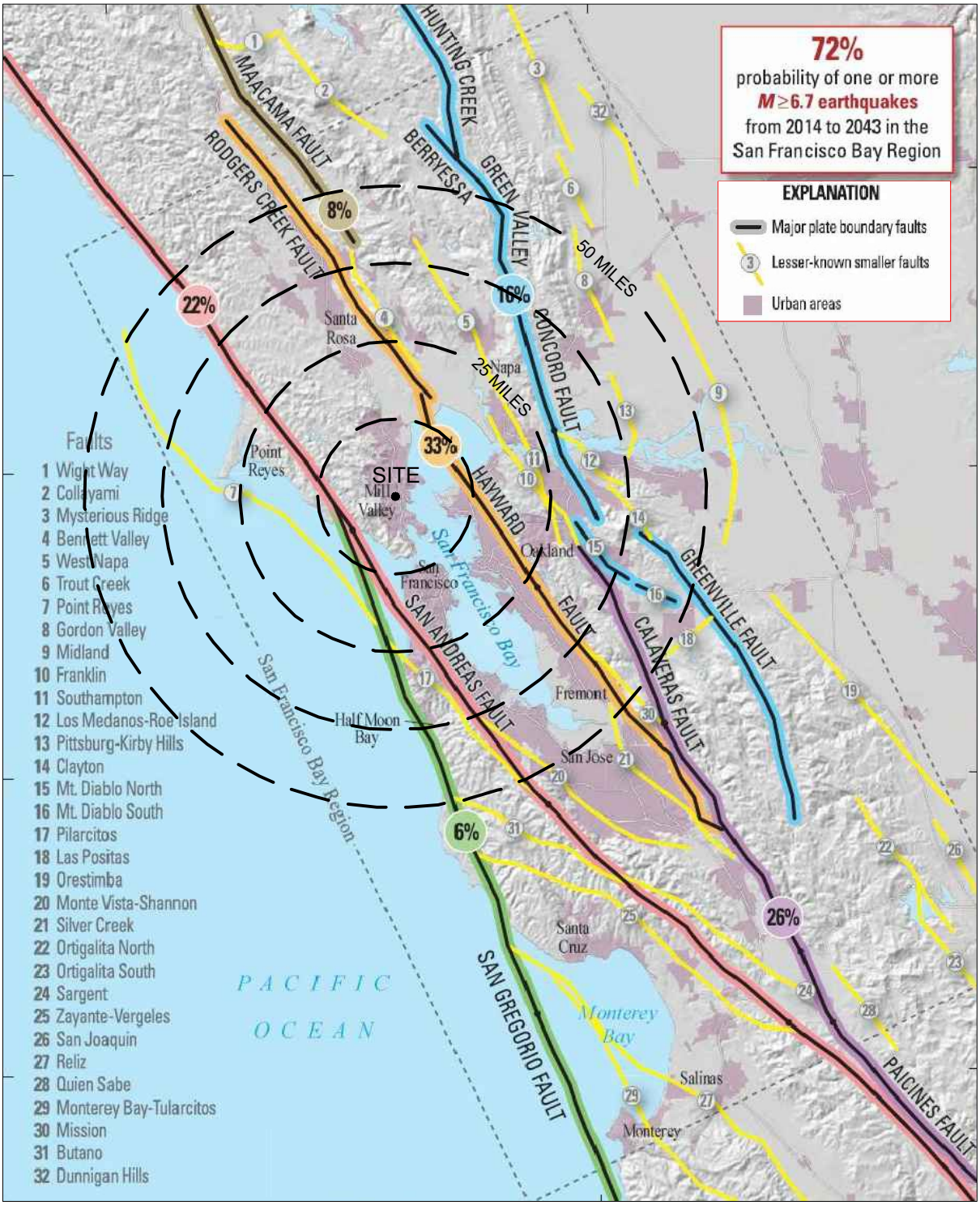
Based on the updated aggregate maps prepared by Stinson et al. (2013), the project area is designated as either category MRZ-1 or MRZ-3. The project area has not been mapped by the State of California as a source location for aggregate minerals of regional or local value to residents of the State or area.

4.5.1.4 Seismic Conditions

The project site is located within a seismically active region that includes the Central and Northern Coast Mountain Ranges. Several active faults are present in the area, including the San Andreas, San Gregorio, Hayward, and Rodgers Creek, among others. An “active” fault is defined as one that shows displacement within the last 11,000 years and, therefore, is considered more likely to generate a future earthquake than a fault that shows no evidence of recent rupture. The California Department of Conservation, Division of Mines and Geology has mapped various active and inactive faults in the region (CDMG, 1972 and 2000). These faults are shown in relation to the project site on the attached Active Fault Map, Figure 4.5.1.

The project area does not intersect an Alquist-Priolo Earthquake Fault Zone (A-PEFZA) and the nearest A-PEFZA fault zone is located approximately 8 miles (12.8 kilometers) southwest. The next nearest active fault is the Hayward-Rodger Creek fault 10 miles to the east. Both the San Andreas and Hayward-Rodgers Creek faults are right lateral strike-slip faults with a northwest-southeast

[77] California Department of Conservation, 2013. Update of Mineral Land Classification: Aggregate Materials in the North San Francisco Bay Production Region, Sonoma, Marin, and Southwestern Solano Counties, California, California Geological Survey.



SITE COORDINATES
LAT. 37.9530°
LON. -122.5380°

LSA

FIGURE 4.5-1

N

0 12.5 25
MILES

SOURCE: Miller Pacific Engineering, June 2017

Sir Francis Drake Boulevard Rehabilitation Project

Active Fault Map

P:\BKF1501\g\EIR\Figure 4.5-1_Active Fault Map.cdr (8/8/2017)

axis,[78] and, as noted above, have a 22 percent and 33 percent chance, respectively, of an M> 6.7 earthquake occurring between 2014 and 2043. Therefore, the site will likely experience moderate to strong ground shaking from future earthquakes originating on any of the several active faults in the San Francisco Bay region.

Seismic and Geologic Hazards

This section describes hazards related to the seismic and geologic conditions of the project area and is partly based on the 2017 Geotechnical Investigation.

Surface Rupture. Surface rupture occurs when the ground surface is broken due to fault movement during an earthquake. The location of surface rupture generally can be assumed to be along an active or potentially active major fault trace. No active or potentially active faults are mapped to intersect the project area.

Ground Shaking. Ground shaking is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake, which is normally the major cause of damage in seismic events. The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. A related concept is acceleration, which is measured as a fraction or percentage of the acceleration gravity (g); it measures the acceleration of the ground as it moves during an earthquake. The Modified Mercalli Intensity Scale (MMI) is the most commonly used scale for measurement of the subjective effects of earthquake intensity (Table 4.5.A). The closest active fault to the project area is the San Andreas Fault, located approximately eight miles to the southwest. The ABAG earthquake hazard mapping is based on research by the USGS, and indicates a Magnitude 8.0 event on the San Andreas Fault (similar to the 1906 earthquake) would result in very strong (MMI-VIII) shaking in the project area.[79] Other potentially damaging seismic sources located in the vicinity of the project area include the active Hayward-Rodgers Creek faults, approximately 10 miles to the east, and considered capable of generating a moment magnitude (M_W) 7.3 earthquake.

Liquefaction and Lateral Spreading. Liquefaction is the temporary transformation of loose, saturated granular sediments from a solid state to a liquefied state as a result of seismic ground shaking. In the process, the soil undergoes transient loss of strength, which commonly causes ground displacement or ground failure to occur. This can result in either incremental or catastrophic structural failure. Liquefaction potential varies according to the thickness of the alluvial deposits, the distribution of clay-free granular materials within those deposits, and the abundance of groundwater shallower than 50 feet. Since saturated soils are a necessary condition for liquefaction,

[78] Right-lateral: If the trace of the fault were viewed while standing on one side during an event, it would appear that the ground on the other side of the fault moved to the right. Strike-slip: The sides of a fault are moving laterally relative to each other with little or no vertical movement.

[79] ABAG, 2013. Earthquake Shaking Scenario, Entire San Andreas Fault: Magnitude 7.9 event. Accessed 06/19/17 at: http://gis.abag.ca.gov/website/Hazards/?hlyr=northSanAndreas.

soil layers in areas where the groundwater table is near the surface have higher liquefaction potential than those in which the water table is located at greater depths.[80]

The majority of soils along the project alignment are rated as being high to very high hazard for liquefaction by USGS/ABAG regional mapping.[81] A high to very high hazard for liquefaction indicates that a combination of the three factors driving the liquefaction hazard (density and composition of near surface soils, presence and level of groundwater, and potential earthquake shaking intensity) combine to present a likelihood that, in the event of an earthquake on an appropriate fault, the area would be exposed to strong enough shaking for some damaging liquefaction to occur. Areas of low and very low liquefaction hazard are located in Kentfield around Oak Avenue/Broadway and in Larkspur west of Bon Air Road.

Lateral spreading is a form of horizontal displacement of soil toward an open creek channel or other "free" face, such as an excavation boundary. Lateral spreading can result from either the slump of low-cohesion unconsolidated material or more commonly by liquefaction of either the soil layer or a subsurface layer underlying soil material on a slope.[82] The lateral spreading hazard tends to mirror the liquefaction hazard for a site.

Table 4.5.A: Modified Mercalli Intensity Scale

I	Not felt except by a very few under especially favorable circumstances.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
IV	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII	Everybody runs outdoors. Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.

[80] Perkins, Jeanne B. 2001. The Real Dirt on Liquefaction, A Guide to the Liquefaction Hazard in Future Earthquakes Affecting the San Francisco Bay Area, ABAG Publication Number: P01001EQK, February.
[81] ABAG, 2001. Liquefaction Hazard Map. Accessed 10/5/09 at: quake.abag.ca.gov.
[82] Rauch, Alan F., 1997, EPOLLS: An Empirical Method for Predicting Surface Displacements due to Liquefaction-Induced Lateral Spreading in Earthquakes, Ph. D. Dissertation, Virginia Tech, Blacksburg, VA.

Table 4.5.A: Modified Mercalli Intensity Scale

IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Board fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted.

Source: California Geological Survey 2002. *How Earthquakes and Their Effects are Measured*: Note 32.

Expansive Soils. Expansion and contraction of volume can occur when expansive soils undergo alternating cycles of wetting (swelling) and drying (shrinking). During these cycles, the volume of the soil changes markedly. As a consequence of such volume changes, structural damage to buildings and infrastructure may occur if the potentially expansive soils were not considered in project design and during construction. According to the County of Marin map viewer,[83] most of the soils in the project area have nil to low expansion potential. One area of highly expansive soils is located south of SFDB near the Barry Way intersection at Drake's Landing.

Slope Stability. Slope failure can occur in a variety of ways, as either rapid movement of large masses of soil ("landslide") or slow, continuous movement ("creep") of materials. Other types of failure include spalling (the flaking off of layers of rock), or rockfall where fractured fragments of rock fall freely out of a slope face. The primary factors influencing the stability of a slope are: (1) the nature of the underlying soil or bedrock; (2) the geometry of the slope (height and steepness); (3) rainfall; and (4) the presence of previous landslide deposits. The slopes in the vicinity of the project area are variously mapped by the USGS as Slope Stability Category 1, 1A, 4, and 5, which represent, respectively:[84]

- Slope Stability Category 1: Stable – Areas of 0 to 5 percent slope that are not underlain by landslide deposits.
- Slope Stability Category 1A: Unstable – Areas of 0 to 5 percent slope that include tidelands, marshlands, and swamplands that are underlain by moist, unconsolidated muds.
- Slope Stability Category 4: Moderately Unstable – Areas of greater than 15 percent slope underlain by bedrock susceptible to landslide.

[83] County of Marin, MarinMap, https://www.marinmap.org/Html5Viewer/Index.html?viewer=smmdataviewer

[84] Nilsen, T. H., Wright, R. H., et al., 1979. Relative Slope Stability and Land-use Planning in the San Francisco Bay Region, California. USGS Professional Paper 944.

- Slope Stability Category 5: Unstable – Areas of any slope that are underlain by or adjacent to landslide deposits.

The roadway varies in elevation, but has a shallow slope of less than five percent in most areas within the project area. However, some of the land adjacent to the roadway alignment (e.g., Bon Air Road Hill, Greenbrae) are sloped and are classified as "mostly landslides" by Marin County's MarinMap.[85]

Settlement and Differential Settlement. Settlement or differential settlement of improvements could occur if they were built on low-strength foundation materials (including imported non-engineered fill) or if improvements straddle the boundary between different types of subsurface materials (e.g., a boundary between native material and fill). Although settlement generally occurs slowly enough that its effects are not dangerous to users, it can cause significant structural damage over time. Portions of the project area that may contain loose or uncontrolled (non-engineered) fill adjacent to stable bedrock or dense alluvium may be susceptible to differential settlement.

4.5.2 Regulatory Framework

The following discussion includes a description of the regulatory context (including regulatory agencies and policy documents) for geologic and seismic issues as they relate to development on the project area.

4.5.2.1 Federal Regulations

National Earthquake Hazards Reduction Program. The National Earthquake Hazards Reduction Program (NEHRP) was established by the U.S. Congress when it passed the Earthquake Hazards Reduction Act of 1977, Public Law (PL) 95–124. In establishing NEHRP, Congress recognized that earthquake-related losses could be reduced through improved design and construction methods and practices, land use controls and redevelopment, prediction techniques and early-warning systems, coordinated emergency preparedness plans, and public education and involvement programs.

4.5.2.2 State Regulations

Alquist-Priolo Earthquake Fault Zoning Act (A-PEFZA). Surface rupture is the most easily avoided seismic hazard. The A-PEFZA was passed in December 1972 to mitigate the hazard of surface faulting in structures used for human occupancy. The A-PEFZA's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The A-PEFZA only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards (the Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides).

The law requires the State Geologist to establish regulatory zones, known as Earthquake Fault Zones, around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and State agencies for their use in planning and

[85] County of Marin, MarinMap, https://www.marinmap.org/Html5Viewer/Index.html?viewer=smmdataviewer

controlling new or renewed construction. Local agencies must regulate most development projects within the zones. Projects include all land divisions and the development of most structures for human occupancy. Before a project can be permitted, cities and counties must require a geologic investigation of a project area to demonstrate that proposed buildings will not be constructed across active faults. The evaluation and written report of a specific site must be prepared by a licensed geologist. If an active fault is found, a structure for human occupancy must be set back 50 feet from the fault trace. The proposed project does not include structures for human occupancy. Therefore, this regulation is not directly applicable to the proposed project.

Seismic Hazards Mapping Act (SHMA). In 1990, following the 1989 Loma Prieta earthquake, the California Legislature enacted the SHMA to protect the public from the effects of strong ground shaking, liquefaction, landslides and other seismic hazards. The SHMA established a State-wide mapping program to identify areas subject to violent shaking and ground failure; the program is intended to assist cities and counties in protecting public health and safety. The SHMA requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. As a result, the California Geologic Survey (CGS) is mapping SHMA Zones and has completed seismic hazard mapping for the portions of California most susceptible to liquefaction, ground shaking, and landslides: primarily the San Francisco Bay Area and Los Angeles basin. At the time of the preparation of this Draft EIR, the County of Marin has not yet been mapped in conformance with the SHMA, and CGS has not indicated a schedule for completion of the study.

California Building Code. The 2013 California Building Code (CBC) refers to Part 2 of the California Building Standards Code in Title 24 of the California Code of Regulations and is based on the 2012 International Building Code. The 2013 CBC covers grading and other geotechnical issues, building specifications, and non-building structures. The CBC requires that a site-specific geotechnical investigation report be prepared by a licensed professional for proposed developments of one or more buildings greater than 4,000 square feet to evaluate geologic and seismic hazards.

The purpose of a site-specific geotechnical investigation is to identify seismic and geologic conditions that require project mitigation, such as surface fault ruptures, ground shaking, liquefaction, differential settlement, lateral spreading, expansive soils, and slope stability. Requirements for the geotechnical investigation are presented in Chapter 16 “Structural Design” and Chapter 18 “Soils and Foundation” of the 2013 CBC. The geotechnical report prepared for the proposed project addresses these requirements and makes site-specific recommendations for the proposed project.

Surface Mining and Reclamation Act. The Surface Mining and Reclamation Act (SMARA, California Public Resources Code Section 2761, et seq.) requires local governments to consider the impacts of new development on the availability of mineral resources.[86]

[86] California Department of Conservation (CDC), 1987. Mineral Land Classification Special Report 146, Map Plate 2.14, Livermore Quadrangle.

4.5.2.3 Marin County

County of Marin, Uniform Construction Standards. The County of Marin Public Works Department has adopted Uniform Construction Standards (UCS) for public works projects, as adopted 20 January 1970 and as amended and adopted 16 May 2008.[87] The UCS are maintained by the Engineering Services Division which provides Civil Engineering and Surveying services for the County. Primary functions of the Division involve the design and construction of various projects, primarily involving major improvements and repairs for County roads and flood control facilities.

County of Marin Countywide Plan. The following Marin Countywide Plan Environmental Hazards Chapter goals, policies, and programs are applicable to the proposed project.

GOAL EH-2: Safety from Seismic and Geologic Hazards. Protect people and property from risks associated with seismic activity and geologic conditions.

Policy EH-2.1 Avoid Hazard Areas. Require development to avoid or minimize potential hazards from earthquakes and unstable ground conditions.

Program EH-2.a Require Geotechnical Reports. Continue to require any applicant for land division, master plan, development approval, or new construction in a geologic hazard area to submit a geotechnical report prepared by a State-certified Engineering Geologist or a Registered Geotechnical Engineer that:

- evaluates soil, slope, and other geologic hazard conditions;
- commits to appropriate and comprehensive mitigation measures sufficient to reduce risks to acceptable levels, including post-construction site monitoring, if applicable;
- addresses the impact of the project on adjacent lands, and potential impacts of offsite conditions; and
- meets the requirements of other agency regulations with jurisdiction in the hazard area, such as BCDC requirements for the safety of fills consistent with the Bay Plan.

Program EH-2.b Require Construction Observation and Certification. Require any work or construction undertaken to correct slope instability or mitigate other geologic hazard conditions to be supervised and certified by a geotechnical engineer and/or an engineering geologist.

Program EH-2.g Identify Compressible Soil Potential. Require that geotechnical reports for projects on land underlain by compressible materials (such as fill, bay mud, and marsh or slough areas) delineate locations where settlement will be greatest and subsidence may occur, and recommend site preparation and construction techniques necessary to reduce risk and public liability to an acceptable level.

[87] County of Marin, 2009. Public Works: Uniform Construction Standards, All cities and County of Marin. Accessed at: www.co.marin.ca.us/depts/pw/main/pdfs/uniform_standards/UCS-compiled.pdf

Program EH-2.j Seek Supplemental Expertise. Continue to hire consultants expert in soils engineering as necessary for evaluating specific developments proposed on bay mud and fill prone to differential settlement.

Program EH-2.l Reliability of Lifelines and Access (Evacuation) Routes. In cooperation with utility system providers, emergency management agencies, and others, assist in the development of strategies to reduce adverse effects of geologic hazards, especially fault surface rupture and landslides to critical public lifelines, and access (i.e., evacuation) routes in an emergency.

Marin County Code. The Marin County Municipal Code contains various ordinances relevant to the conditions of the geology and soils of the proposed project. Outlined below are Marin County Code excerpts pertaining to roadway construction, soil investigations, excavations, and erosion control/stormwater management, which relate to the proposed project. Title 24, Development Standards, establish standards of improvements and construction for the development of land within the unincorporated area of the County.

Sections 24.04.020 through 24.04.230, Roads, establish the standards for new road construction. Design modifications and/or other mitigation measures are allowed where severe physical, right-of-way or other constraints prevent implementation of the standards. These measures may include but are not limited to additional width, longer radii, slope grading, vegetation removal, striping or other lane and/or road edge delineation, signs, signals and barriers.

Section 24.04.625, Erosion and Sediment Control, requires that all disturbed surfaces be protected against erosion and sediment discharges by appropriate measures. When required by the Phase II Stormwater Permit, an erosion and sediment control plan (ESCP), which addresses erosion and sediment control, and pollution prevention measures during construction and operation, may be required. The ESCP and the specific control measures to be utilized are subject to the review and approval of Marin County. An ESCP shall be required for the proposed project, which includes site-specific construction-phase BMPs.

Construction-phase BMPs include erosion and sediment controls and pollution prevention practices. Erosion control BMPs may include, but are not limited to, scheduling and timing of grading activities, timely revegetation of graded areas, the use of hydroseed and hydraulic mulches, and installation of erosion control blankets. Sediment control may include properly sized detention basins, dams, or filters to reduce entry of suspended sediment into the storm drain system and watercourses, and installation of construction entrances to prevent tracking of sediment onto adjacent streets. Pollution prevention practices may include designated washout areas or facilities, control of trash and recycled materials, covering of materials stored on-site, and proper location of and maintenance of temporary sanitary facilities. The combination of BMPs used, and their execution in the field, must be customized to the site using up-to-date standards and practices.

Section 24.04.625 further requires that grading operations not be conducted during the rainy season (October 15 through April 15) without prior approval from the Marin County Department of Public Works. Such approval shall only be given upon clear demonstration that at no stage of the work will there be any substantial risk of increased sediment discharge from the site.

4.5.2.4 City of Larkspur

1990 City of Larkspur General Plan. The following policies and programs from the Larkspur General Plan apply to the proposed project: [88]

Health and Safety

Goal 3: Avoid development in areas prone to natural hazards.

Policy e: Allow land uses in areas prone to natural hazards only with appropriate mitigation.

Action Program [6]: Continue to regulate development to assure the adequate mitigation of safety hazards on sites having a history or threat of slope instability, seismic activity (including liquefaction, subsidence, and differential settlement), flooding, or fire.

Goal 6: Limit the exposure of existing and future structures to risk from landslides, debris flow, and subsidence, and minimize the potential for damage.

Action Program [26]: Adopt standards for geologic and geotechnical reports that outline the type and extent of investigation required for various stages of the development process, for various geologic and soils conditions, and for the type of land use and structure proposed.

4.5.3 Significance Criteria

Appendix G of the State CEQA Guidelines states the proposed project would result in a significant geologic, soils or seismic impact if it would have any of the following effects:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure (including liquefaction); and/or
  - Landslides.
- Result in substantial soil erosion or loss of topsoil;

[88] City of Larkspur, 1990. *City of Larkspur, CA, General Plan*. http://www.ci.larkspur.ca.us/152/General-Plan. Accessed: June 16, 2017.

- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewer is not available for the disposal of waste water.

In addition, based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may also have a significant impact related to geologic hazards if it would be located:

- Within an Alquist-Priolo Special Studies Zone, a known active fault zone, or an area characterized by surface rupture that might be related to a fault.
- In an area with substrate consisting of material that is subject to liquefaction or other secondary seismic hazards in the event of ground shaking.
- In an area with evidence of static hazards, such as landsliding or excessively steep slopes, that could result in slope failure.
- In the vicinity of soil that is likely to collapse, as might be the case with karst topography, old mining properties, or areas of subsidence caused by groundwater drawdown.
- In an area with soils characterized by shrink/swell potential that might result in deformation of foundations or damage to structures.
- In a Mineral Resource Zone identified by the California Department of Mines and Geology.

4.5.4 Impacts and Mitigation Measures

This section identifies the potential significant geologic and seismic impacts associated with the proposed Sir Francis Drake Boulevard Rehabilitation Project. Mitigation measures are recommended, as appropriate, for significant impacts to reduce them to a less-than-significant level. This section also identifies impacts that are considered to be less than significant.

(1) Located within an Alquist-Priolo Earthquake Fault Zone. No active or potentially active faults have been mapped at, or adjacent to, the project area, and no portion of the site is located within an Alquist-Priolo Earthquake Fault Zone. Therefore, the potential for fault rupture at the site is negligible.

(2) Seismic Shaking. All structures in the Bay Area could potentially be affected by ground shaking in the event of an earthquake. The amount of ground shaking that would occur depends on the magnitude of the earthquake, the distance from the epicenter, and the type of earth materials

in between. Violent ground shaking could occur at the project site during expected earthquakes on the San Andreas Fault. In addition, strong to very strong shaking could occur at the project site during earthquakes on other regional faults.

Impact GEO-1: Strong ground shaking at the project site could result in risks to humans and damage to property. (S)

The entire San Francisco Bay Area, including the project area, is located in a seismically active region subject to varying degrees of seismic ground shaking. Ground shaking is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake, and is normally the major cause of damage in seismic events. The extent of ground-shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. As described above, the major active fault in the County that could cause ground shaking at the project site is the San Andreas Fault. The most significant adverse impact associated with strong seismic shaking is potential damage to structures and improvements. No habitable structures would be constructed as part of the proposed project; however, improvements are proposed that could be affected by strong ground shaking.

The Geotechnical Investigation prepared for the MMWD Pipeline Replacement portion of the project indicates that excavation for the proposed pipeline replacement will encounter a variety of geologic materials, including medium stiff and medium-dense alluvial and colluvial deposits at the western end of the alignment and medium dense to dense fill underlain by soft Bay Mud or weak to strong Franciscan Mélange and sandstone bedrock at the eastern end near Highway 101.

As described above, the majority of soils along the project alignment are rated as being high to very high hazard for liquefaction. Areas of low and very low liquefaction hazard are located in Kentfield around Oak Avenue/Broadway and in Larkspur west of Bon Air Road. Liquefiable soils may be subject to temporary bearing capacity loss during an earthquake event, and may allow either total or differential vertical settlement, and may be subject to lateral spreading. In addition, steep slopes are located adjacent to the roadway alignment in some areas, presenting a risk for seismically induced landslides.

The proposed project would be designed and constructed consistent with the most current version of the California Building Code, which includes specifications for site preparation, such as compaction requirements for foundations, and the Marin County Code. The Geotechnical Investigation prepared for the MMWD Pipeline Replacement includes recommendations for excavation associated with the proposed pipeline, including slope configurations and shoring requirements, as well as backfill criteria. In addition, implementation of Mitigation Measure GEO-1, which requires design of structures by a professional engineer and review by Marin County Department of Public Works would ensure proposed improvements are designed to withstand seismic ground shaking, to the extent feasible.

> Mitigation Measure GEO-1: All grading plans, cut and fill slopes, compaction procedures, and retaining structures shall be designed by a licensed professional engineer and inspected during construction by a licensed professional engineer (or representative) or Certified Engi-

neering Geologist (or representative). All designs shall be submitted to, and approved by, the Marin County Department of Public Works prior to implementation. (LTS)

Significance After Implementation. Seismic hazards cannot be completely eliminated, even with site-specific geotechnical methods and advanced building practices. However, exposure to seismic hazards is generally an accepted part of living in the seismically active areas of California. Implementation of Mitigation Measure GEO-1 would reduce potential ground shaking impacts to less than significant.

(3) Slope Instability/Landslide. The majority of proposed project improvements would be constructed within the roadway right-of-way, which consists of relatively flat terrain where the potential for landslide is low. However, some of the upland areas adjacent to the roadway alignment include relatively steep slopes on which landslides have occurred.

The proposed project would construct segments of retaining wall (no more than 3 feet in height) on portions of SFDB to facilitate proposed improvements. Low retaining wall segments would be used to increase the sidewalk width without extending the grading limits. Construction of site improvements (e.g., retaining walls) within or adjacent to landslides or slopes prone to landsliding could result in damage during new or continued slope movement. The potential for slope failure is increased during the expected very strong to very violent seismic shaking (particularly if the causative earthquake occurs during the rainy season when groundwater levels are high).

It is anticipated that the proposed retaining walls would be constructed to promote stability for the subsurface materials and minimize erosion. Further, with implementation of Mitigation Measure GEO-1, impacts associated with slope instability/landslides would be less than significant.

(4) Erosion and Sedimentation. Excavation, grading, and construction on the project site would require temporary disturbance and exposure of shallow soils through removal of existing pavements, and some vegetative cover. During the construction period, excavation and grading activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. As described in Section 4.8, Hydrology and Water Quality, a Stormwater Pollution Prevention Plan (SWPPP) will be required for construction that includes disturbance of 1 acre or more of soil at the project site in compliance with the National Pollutant Discharge Elimination System (NPDES) General Permit (GP) for Construction (Order 2009-009-DWQ) (Construction General Permit). Although designed primarily to protect storm water quality, the SWPPP would incorporate Best Management Practices (BMPs) to minimize erosion. Compliance with the Construction General Permit and implementation of the SWPPP would reduce potential construction phase erosion and sedimentation impacts to less than significant.

As described in Section 4.8, Hydrology and Water Quality, the proposed project would implement stormwater quality facilities such as bioretention areas and pervious pavement that would enhance the infiltration of stormwater to the subsurface and thereby result in a beneficial decrease in the amount of stormwater runoff. Therefore, long-term operation of the proposed project would result in less-than-significant erosion and sedimentation impacts. Additional discussion of potential erosion impacts related to stormwater management, and required compliance with National

Pollutant Discharge Elimination System (NPDES) permits during the construction and operational phases of the project are discussed in Section 4.8, Hydrology and Water Quality.

(5) Soil Collapse. The underlying geology of the project area is Franciscan Complex mélange and Franciscan Complex bedrock generally mantled with a relatively thin layer of alluvial soils or fluvial deposits. The project is not located in an area with karst topography, old mining properties, or subject to subsidence caused by groundwater drawdown.

(6) Expansive Soils. Expansion and contraction of volume can occur when expansive soils undergo alternating cycles of wetting (swelling) and drying (shrinking). During these cycles, the volume of the soil changes markedly. Expansive soils are common throughout California and can cause damage to foundations and slabs unless properly treated during construction. As described above, most of the soils in the project area have nil to low expansion potential. One area of highly expansive soils is located south of SFDB near the Barry Way intersection at Drake's Landing.

The Geotechnical Investigation includes recommendations that would address potentially expansive soils, including mitigation for potentially expansive soils, bracing of trench walls during construction of waterline replacement, and criteria for backfill of proposed trenches. In addition, the proposed project would be designed and constructed consistent with the most current version of the California Building Code, which includes specifications for site preparation, such as compaction requirements for foundations. Therefore, with incorporation of geotechnical recommendations, compliance with building code requirements, and oversight of earthwork activities by a California licensed geotechnical engineer, the potential impacts associated with expansive soils would be less than significant.

(7) Soils Capable of Adequately Supporting an Alternative Waste Water Disposal System. The project site is located in a developed area of Marin County that is served by a municipal wastewater collection, conveyance, and treatment system. No septic tanks are proposed.

(8) Mineral Resources. The project is not located in an area mapped by the State of California or County of Marin as a source location for known mineral resources of value to the region and residents of the State, and rehabilitation of the road would not result in the loss of known mineral resources.

(9) Unique Geologic Feature(s). As the project is the rehabilitation of an existing roadway and does not propose extensive alteration or grading within the alignment, implementation of the project would not impact a known unique geologic feature.

4.6 GLOBAL CLIMATE CHANGE

This section includes a discussion of global climate change, its causes and the contribution of human activities, as well as a summary of existing greenhouse gas emissions. The section describes the criteria for determining the significance of climate change impacts, and estimates the likely greenhouse gas emissions that would result from construction activities, vehicular traffic, energy consumption, and other emission sources. Where appropriate, mitigation measures are recommended to reduce project-related impacts to a less-than-significant level. The analysis performed for this section is based on the Bay Area Air Quality Management District's (BAAQMD) CEQA Air Quality Guidelines.[89]

4.6.1 Setting

The following discussion describes existing greenhouse gas emissions in Marin County and the Bay Area, beginning with a discussion of typical greenhouse gas types and sources, impacts of global climate changes, the regulatory framework surrounding these issues, and current emission levels.

4.6.1.1 Background

The following section provides background information on greenhouse gases and global climate change.

Global Climate Change. Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. Global surface temperatures have risen by 0.74°C (±0.18°C) over the last 100 years (1906–2005). The rate of warming over the last 50 years is almost double that over the last 100 years.[90] The prevailing scientific opinion on climate change is that most of the warming observed over the last 50 years is attributable to human activities. The increased amounts of carbon dioxide (CO_2) and other greenhouse gases are the primary causes of the human-induced component of warming. Greenhouse gases are released by the burning of fossil fuels, land clearing, agriculture, and other activities and lead to an increase in the greenhouse effect.[91]

Greenhouse gases are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are the following:

- Carbon dioxide (CO_2)

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89 Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines.* May.

90 Intergovernmental Panel on Climate Change, 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC.*

91 The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." Just as the glass in a greenhouse lets heat from sunlight in and reduces the heat escaping, greenhouse gases like carbon dioxide, methane, and nitrous oxide in the atmosphere keep the Earth at a relatively even temperature. Without the greenhouse effect, the Earth would be a frozen globe; thus, although an excess of greenhouse gas results in global warming, the *naturally occurring* greenhouse effect is necessary to keep our planet at a comfortable temperature.

- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF_6)

Over the last 200 years, humans have caused substantial quantities of greenhouse gases to be released into the atmosphere. These extra emissions are increasing greenhouse gases concentrations in the atmosphere and enhancing the natural greenhouse effect, which is believed to be causing global warming. While manmade greenhouse gases include naturally occurring greenhouse gases such as CO_2, CH_4, and N_2O, some gases, such as HFCs, PFCs, and SF_6, are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of greenhouse gases above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

These gases vary considerably in terms of global warming potential (GWP), which is a concept developed to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. The GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere (atmospheric lifetime). The GWP of each gas is measured relative to CO_2, the most abundant greenhouse gas. The definition of the GWP for a particular greenhouse gas is the ratio of heat trapped by one unit mass of the greenhouse gas to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. Greenhouse gas emissions are typically measured in terms of pounds or tons of CO_2 equivalents (CO_2e). Table 4.6.A shows the GWPs for each type of greenhouse gas. For example, SF_6 is 22,800 times more potent at contributing to global warming than CO_2.

Table 4.6.A: Global Warming Potential of Greenhouse Gases

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100-year Time Horizon)
Carbon Dioxide	50-200	1
Methane	12	25
Nitrous Oxide	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Tetrafluoromethane (CF_4)	50,000	7,390
PFC: Hexafluoromethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

Source: Intergovernmental Panel on Climate Change, 2007. *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the IPCC.

The following discussion summarizes the characteristics of the major greenhouse gases.

Carbon Dioxide. In the atmosphere, carbon generally exists in its oxidized form as CO_2. Natural sources of CO_2 include the respiration (breathing) of humans, animals and plants, volcanic outgassing, decomposition of organic matter, and evaporation from the oceans. Human caused sources of CO_2 include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. Natural sources release approximately 150 billion tons of CO_2 each year, far outweighing the 7 billion tons of man-made emissions of CO_2 each year. Nevertheless, natural removal processes, such as photosynthesis by land and ocean-dwelling plant species, cannot keep pace with this extra input of man-made CO_2, and, consequently, the gas is building up in the atmosphere.

In 2012, CO_2 emissions from fossil-fuel combustion accounted for approximately 94 percent of U.S. CO_2 emissions and approximately 86.5 percent of California's overall greenhouse gas emissions (CO_2e)[92] from 2000 to 2012. The transportation sector accounted for California's largest portion of CO_2 emissions, with gasoline consumption making up the greatest portion of these emissions. Electricity generation was California's second largest category of greenhouse gas emissions.

Methane. Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands, termites, and oceans. Decomposition occurring in landfills accounts for the majority of human-generated CH_4 emissions in California and in the United States as a whole. Agricultural processes such as intestinal fermentation, manure management, and rice cultivation are also significant sources of CH_4 in California. Methane accounted for approximately 7.2 percent of gross climate change emissions (CO_2e) in California from 2000 to 2014.[93]

Total annual emissions of methane are approximately 500 million tons, with manmade emissions accounting for the majority. As with CO_2, the major removal process of atmospheric methane—a chemical breakdown in the atmosphere—cannot keep pace with source emissions, and methane concentrations in the atmosphere are increasing.

Nitrous Oxide (N_2O). Nitrous oxide is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. Nitrous oxide is a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion emit N_2O, and the quantity emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N_2O emissions in California. Nitrous oxide emissions accounted for approximately 2.9 percent of man-made greenhouse gas emissions (CO_2e) in California from 2000 to 2012.[94]

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92 California Environmental Protection Agency, Air Resources Board, 2014. *California Greenhouse Gas Emission Inventory: 2000-2012.* March.

93 Ibid.

94 Ibid.

Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF_6). Hydrofluorocarbons are primarily used as substitutes for ozone-depleting substances regulated under the Montreal Protocol.[95] Perfluorocarbons and SF_6 are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. No aluminum or magnesium production occurs in California; however, the rapid growth in the semiconductor industry leads to greater use of PFCs. Hydrofluorocarbons, PFCs, and SF_6 accounted for about 4.1 percent of man-made greenhouse gas emissions (CO_2e) in California from 2000 to 2012. [96]

Black Carbon. Black carbon is the strongest light-absorbing component of PM formed by burning fossil fuels such as coal, diesel, and biomass. Black carbon is emitted directly into the atmosphere in the form of $PM_{2.5}$ and is the most effective form of PM, by mass, at absorbing solar energy. Per unit of mass in the atmosphere, black carbon can absorb a million times more energy than CO_2.[97] Black carbon contributes to climate change both directly, such as absorbing sunlight, and indirectly, such as affecting cloud formation. However, because black carbon is short-lived in the atmosphere, it can be difficult to quantify its effect on global warming.

Most U.S. emissions of black carbon come from mobile sources (52 percent), particularly from diesel fueled vehicles. The other major source of black carbon is open biomass burning, including wildfires, although residential heating and industry also contribute. The ARB estimates that the annual black carbon emissions in California have decreased approximately 70 percent between 1990 and 2010 and are expected to continue to decline significantly due to controls on mobile diesel emissions.

Impacts of Climate Change. The potential impacts of global climate change are described in the following section.

Temperature Increase. The latest projections, based on state-of-the art climate models, indicate that temperatures in California are expected to rise 3 to 10.5°F by the end of the century.[98] Because greenhouse gases persist for a long time in the atmosphere, accumulate over time, and are generally well-mixed, their impact on the atmosphere cannot be tied to a specific point of emission.

Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from the following:

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;

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95 The Montreal Protocol is an international treaty that was approved on January 1, 1989, and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for ozone depletion.

96 Ibid.

97 U.S. EPA. 2015. *Black Carbon*. September. http://www3.epa.gov/blackcarbon/basic.html (accessed on February 17, 2016).

98 California Climate Change Center, 2006. *Our Changing Climate. Assessing the Risks to California.* July.

- Natural processes within the climate system (i.e., changes in ocean circulation and reduction in sunlight from the addition of greenhouse gases and other gases to the atmosphere from volcanic eruptions); or

- Human activities that change the atmosphere's composition (i.e., through burning fossil fuels) and the land surface (i.e., from deforestation, reforestation, urbanization, and desertification).

The primary effect of global climate change has been a rise in the average global temperature. The impact of human activities on global climate change is readily apparent in the observational record. For example, surface temperature data show that 11 of the 12 years from 1995 to 2006 rank among the 12 warmest since 1850, the beginning of the instrumental record for global surface temperature.[99] Climate change modeling shows that further warming could occur, which would induce additional changes in the global climate system during the current century. Changes to the global climate system, ecosystems, and the environment of California could include but are not limited to the following:

- The loss of sea ice and mountain snowpack resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;

- Rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps in the Greenland and Antarctic ice sheets;

- Changes in weather that include widespread changes in precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;

- Decline of the Sierra snowpack, which accounts for a significant amount of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years;

- Increase in the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas of Los Angeles and the San Joaquin Valley by the end of the 21st century; and

- High potential for erosion of California's coastlines and seawater intrusion into the Delta and levee systems due to the rise in sea level.

Precipitation and Water Supply. Global average precipitation is expected to increase overall during the 21st century as the result of climate change but will vary in different parts of the world. However, global climate models are generally not well-suited for predicting regional changes in

[99] California, State of, 2008. California Energy Commission's Public Interest Energy Research Program. *The Future is Now: An Update on Climate Change Science, Impacts, and Response Options for California*. September.

precipitation because of the scale of regionally important factors (e.g., proximity of mountain ranges) that affect precipitation.[100]

Most of California's precipitation falls in the northern part of the State during the winter. A vast network of man-made reservoirs and aqueducts capture and transport water throughout the State from northern California rivers, as the greatest demand for water comes from users in the southern part of the State during the spring and summer.[101] The current distribution system relies on Sierra Nevada snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages.

Some models predict drier conditions and decreased water flows, while others predict wetter conditions in various parts of the world. If heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, thus reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent over the next 100 years.

The extent to which various meteorological conditions will impact groundwater supply is unknown. Warmer temperatures could increase the period when water is on the ground by reducing soil freeze. However, warmer temperatures could also lead to higher evaporation or shorter rainfall seasons, shortening the recharge season. Warmer winters could increase the amount of runoff available for groundwater recharge. However, the additional runoff would occur at a time when some basins, particularly in Northern California, are being recharged at their maximum capacity.

Where precipitation is projected to increase in California, the increases are focused in Northern California. However, various California climate models provide mixed results regarding changes in total annual precipitation in the State through the end of this century; therefore, no conclusion on an increase or decrease can be made. Considerable uncertainties about the precise effects of climate change on California hydrology and water resources will remain until there is more precise and consistent information about how precipitation patterns, timing, and intensity will change.[102]

The Marin Municipal Water District (MMWD) supplies water throughout central and southern Marin County[103]. Nearly 75 percent of MMWD's water comes from 21,635 acres of protected watershed on Mount Tamalpais and in the grassy hills of West Marin. These areas are mostly forested MMWD-owned lands and other undeveloped rural lands. Rainfall from these watersheds flows into MMWD's seven reservoirs: Lagunitas, Phoenix, Alpine, Bon Tempe, Kent, Nicasio, and Soulajule. Water from these reservoirs is treated and filtered before delivery.

Over 25 percent of MMWD's water is imported from the Sonoma County Water Agency. SCWA water originates from rainfall that flows into Lake Sonoma and Lake Mendocino, and is released into

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100 Intergovernmental Panel on Climate Change, 2007, op. cit.

101 California Climate Change Center, 2006. *Our Changing Climate. Assessing the Risks to California.* July.

102 California, State of, 2006. Department of Water Resources. *Progress on Incorporating Climate Change into Management of California's Water Resources*. July.

103 Marin Municipal Water District. n.d. Water. Website: https://www.marinwater.org/31/Water (Accessed June 14, 2017).

the Russian River. The Russian River water is filtered naturally through 80 feet of sand beds adjacent to the River. The Russian River water blends with MMWD's reservoir water within the MMWD's distribution system.

Sea Level Rise. Rising sea level is one of the major areas of concern related to global climate change. Two of the primary causes for a sea level rise are the thermal expansion of ocean waters (water expanding as it heats up) and the addition of water to ocean basins by the melting of land-based ice. From 1961 to 2003, global average sea level rose at an average rate of 0.07 inches per year, and at an accelerated average rate of about 0.12 inches per year during the last decade of this period (1993 to 2003).[104] Over the past 100 years, sea levels along California's coasts and estuaries have risen about 7 inches.[105]

Sea levels could rise an additional 22 to 35 inches by the end of the century as global climate change continues.[106] Although these projections are on a global scale, the rate of sea level rise along California's coast is relatively consistent with the worldwide average rate observed over the past century. Therefore, it is reasonable to assume that changes in worldwide sea level rise will also be experienced along California's coast.

Sea level rise of this magnitude would increasingly threaten California's coastal regions with more intense coastal storms, accelerated coastal erosion, threats to vital levees, and disruption of inland water systems, wetlands, and natural habitats. Rising sea levels and more intense storm surges could increase the risk for coastal flooding. It is projected that under medium to medium-high emissions scenarios, mean sea level along the California coast will rise from 1.0 to 1.4 meters by the year 2100. [107]

In the San Francisco Bay Area, it is estimated that the mean sea level will rise approximately 1.94 millimeters per year over the next 100 years, which is equivalent to a change of 0.64 feet in 100 years.[108] An increased rate of sea level rise is anticipated in the near future due to projected global climate change. Although the rate of increase has not been precisely modeled and cannot be known with certainty, several projections predict a rise in sea level of at least 50 centimeters (approximately 20 inches) and as much as 200 centimeters (approximately 80 inches) by the year 2100.

Water Quality. Water quality depends on a wide range of variables such as water temperature, flow, runoff rates and timing, waste discharge loads, and the ability of watersheds to assimilate

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[104] California, State of, 2008. California Energy Commission's Public Interest Energy Research Program. *The Future is Now: An Update on Climate Change Science, Impacts, and Response Options for California*. September.

[105] Ibid.

[106] California Climate Change Center, 2006. *Our Changing Climate. Assessing the Risks to California.* July.

[107] Pacific Institute. 2012. *The Impacts of Sea Level Rise on the San Francisco Bay*. California Energy Commission. Publication number: CEC-500-2012-014.

[108] National Oceanic & Atmospheric Administration (NOAA), 2017. *Mean Sea Level Trend (station) 9414290 San Francisco, California.* https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=9414290 (accessed July 19, 2017).

wastes and pollutants. Climate change could alter water quality in a variety of ways, including higher winter flows that reduce pollutant concentrations (through dilution) or increased erosion of land surfaces and stream channels, leading to higher sediment, chemical, and nutrient loads in rivers. Water temperature increases and decreased water flows can result in increasing concentrations of pollutants and salinity. Increases in water temperature alone can lead to adverse changes in water quality, even in the absence of changes in precipitation.

Land and resource use changes can have impacts on water quality comparable to or even greater than those from global climate change. The net effect on water quality for rivers, lakes, and groundwater in the future is dependent not just on climate conditions, but also on a wide range of other human actions and management decisions.

Public Health. Global climate change is anticipated to result in not only changes to average temperature but also to more extreme heat events.[109] These extreme heat events increase the risk of death from dehydration, heart attack, stroke, and respiratory distress, especially with people who are ill, children, the elderly, and the poor, who may lack access to air conditioning and medical assistance. According to the California Climate Change Center, more research is needed to understand the effects of higher temperatures and how adapting to these temperatures can minimize health effects.

Emissions Inventories. The emissions inventory that identifies and quantifies the primary human-generated sources and sinks of greenhouse gases is a well-recognized and useful tool for addressing climate change. This section summarizes the latest information on global, United States, California, and local greenhouse gas emission inventories.

Global Emissions. Worldwide net emissions (including the effects of land use and forestry) of greenhouse gases in 2010 were 46 billion metric tons[110] of CO_2e per year.[111] This represents a 35 percent increase from 1990.

United States Emissions. In 2014, the United States emitted about 6,870 million metric tons of CO_2e. The total 2014 CO_2e emissions represent a 7 percent increase since 1990 but a 7 percent decrease since 2005. Of the six major sectors nationwide – residential, commercial, agricultural, industry, transportation, and electricity generation – electricity generation accounts for the highest amount of greenhouse gas emissions since 1990 (approximately 31 percent), with transportation being a close second at 26 percent since 1990; these emissions are generated entirely from direct fossil fuel combustion.[112]

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109 California Climate Change Center, 2006. *Our Changing Climate. Assessing the Risks to California.* July.

110 A metric ton is equivalent to approximately 1.1 tons.

111 U.S. Environmental Protection Agency, 2014. Climate Change Indicators in the United States: Global Greenhouse Gas Emissions. Website: https://www.epa.gov/climate-indicators/climate-change-indicators-global-greenhouse-gas-emissions (accessed July 19, 2017).

112 U.S. Environmental Protection Agency, 2016. Climate Change Indicators: U.S. Greenhouse Gas Emissions. Website: https://www.epa.gov/climate-indicators/climate-change-indicators-us-greenhouse-gas-emissions (accessed July 19, 2017).

State of California Emissions. The ARB is responsible for developing the California Greenhouse Gas Emission Inventory. This inventory estimates the amount of greenhouse gases emitted to and removed from the atmosphere by human activities within the State and supports the AB 32 Climate Change Program.

According to ARB emission inventory estimates, California emitted approximately 440.4 million metric tons of CO_2e emissions in 2015.[113] This represents an overall decrease of 10 percent since peak levels in 2004. During the 2000 to 2015 period, per capita GHG emissions in California have continued to drop from a peak in 2001 of 14.0 metric tons per person to 11.3 metric tons per person in 2015, which is a 19 percent decrease.[114] Overall trends in the inventory also demonstrate that the carbon intensity of California's economy (the amount of carbon pollution per million dollars of gross domestic product [GDP]) is declining, representing a 33 percent decline since the 2001 peak, while the state's GDP has grown 37 percent during this period.[115]

California greenhouse gas emissions from the transportation sector—still the State's largest single source of greenhouse gases, contributing 37 percent of total emissions—grew by 3 percent in 2015, although emissions from this sector are still lower than peak levels in 2005.[116] The ARB attributes much of this decrease to regulations and the growing statewide fleet of fuel-efficient vehicles.[117]

ARB staff has projected 2020 unregulated greenhouse gas emissions, which represent the emissions that would be expected to occur in the absence of any greenhouse gas reduction actions, would be 509 MMT of CO_2e.[118] The total emissions are lower than originally forecast (596 MMT) in the AB 32 Scoping Plan to account for new estimates for future fuel and energy demand and accounting for the recent economic recession.

Greenhouse gas emissions in 2020 from the transportation sector as a whole are expected to increase to 185 MMT of CO_2e, which is approximately 36 percent of the total statewide greenhouse gas emissions in 2020. The industrial sector consists of large stationary sources of greenhouse gas emissions and includes oil and gas production and refining facilities, cement plants, and large manufacturing facilities. Emissions for this sector are forecast to grow to 93.7 MMT of CO_2e by 2020, or about 18 percent of the total statewide greenhouse gas emissions in 2020. The commercial and residential sectors are expected to contribute 49.9 MMT of CO_2e, or about 10 percent of the total statewide greenhouse gas emissions in 2020.[119]

San Francisco Bay Area Emissions. The BAAQMD established a climate protection program in 2005 to acknowledge the link between climate change and air quality. The BAAQMD regularly

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113 California Air Resources Board, 2017. *Greenhouse Gas Inventory Data for 2000–2015*. Website: www.arb.ca.gov/cc/inventory/data/data.htm (accessed July 19, 2017).
114 Ibid.
115 Ibid.
116 Ibid.
117 Ibid.
118 California Air Resources Board, 2013. *Greenhouse Gas Inventory: 2020 Emissions Forecast.* Website: https://www.arb.ca.gov/cc/inventory/data/bau.htm. (accessed July 19, 2017).
119 Ibid.

prepares inventories of criteria and toxic air pollutants to support planning, regulatory, and other programs. The most recent emissions inventory estimates greenhouse gas emissions produced by the San Francisco Bay Area in 2011.[120] The inventory, which was published in January 2015, updates the Air District's previous greenhouse gas emission inventory for base year 2007.

In 2011, 86.6 million metric tons of CO_2e of greenhouse gases were emitted by the San Francisco Bay Area. Fossil fuel consumption in the transportation sector was the single largest source of the San Francisco Bay Area's greenhouse gas emissions in 2011. The transportation sector (including on-road motor vehicles, locomotives, ships and boats, and aircraft) contributed 39.7 percent of greenhouse gas emissions and the industrial and commercial sectors (excluding electricity and agriculture) contributed 35.7 percent of greenhouse gas emissions in the Bay Area. Energy production activities such as electricity generation and co-generation were the third largest contributor with approximately 14.0 percent of the total greenhouse gas emissions. Off-road equipment such as construction, industrial, commercial, and lawn and garden equipment contributed 1.5 percent of greenhouse gas emissions.

Marin County Emissions. Marin County assessed community and municipal greenhouse gas emissions. Community emissions included emissions for the entire County, including the cities and the unincorporated areas. The municipal emissions included activities associated with local government operations.

Total greenhouse gas emissions generated by community activities in the unincorporated areas of the County in 2012 were 477,456 MT CO_2e, which is approximately 0.1 percent of California's greenhouse gas emissions in 2012. This is a 15 percent decrease from estimated 1990 emissions, which were 561,851 MT CO_2e.[121]

As shown in Table 4.6.B, building energy and on-road transportation emissions represent the largest sources of community emissions (approximately 35 percent each). The third-largest source is agriculture with a contribution of 23 percent of the total 2012 inventory. Agriculture is followed by off-road equipment (4 percent), solid waste generation (2 percent), wastewater treatment (1 percent), and water conveyance (0.2 percent).

Table 4.6.B: Marin County 1990 and 2012 Community Greenhouse Gas Inventories

Emission Sector[1]	1990 Inventory		2012 Inventory	
	Emissions (MT CO_2e)	Percent of Inventory	Emissions (MT CO_2e)	Percent of Inventory
Building Energy – Residential	131,265	23	111,484	23
Building Energy – Nonresidential	74,190	13	55,142	12
On-road Transportation	193,544	34	166,773	35
Off-road Vehicles and Equipment	19,300	3	17,126	4
Solid Waste Generation	14,414	3	9,362	2
Water Conveyance	1,319	0.2	1,157	0.2

[120] Bay Area Air Quality Management District, 2015. *Source Inventory of Bay Area Greenhouse Gas Emissions.* January.

[121] Marin, County of. 2015. *Marin County Climate Action Plan 2015 Update.* July.

Table 4.6.B: Marin County 1990 and 2012 Community Greenhouse Gas Inventories

Emission Sector[1]	1990 Inventory		2012 Inventory	
	Emissions (MT CO_2e)	Percent of Inventory	Emissions (MT CO_2e)	Percent of Inventory
Wastewater Treatment	5,453	1	5,562	1
Agriculture[2]	122,366	22	110,850	23
Marin County Total	**561,851**	**100**	**477,456**	**100**

Notes:
[1] Additional emissions sources that were not estimated (or included in the inventory) include aircraft, non-local passenger rail, freight lines, ferries, ozone depleting substances, and other gases with high global warming potential.
[2] Agricultural emissions make up about 5 percent of overall countywide emissions when including the cities.
MT CO_2e = metric tons of carbon dioxide equivalent
Source: Marin County, 2015.

The 2020 Business-as-Usual (BAU) Community Forecast is a prediction of community emissions that would occur in 2020 without accounting for future federal, State, and local actions designed to reduce greenhouse gas emissions. As shown in Table 4.6.C, community greenhouse gas emissions are expected to increase by 3 percent (13,392 MT CO_2e) from 2012 to 2020. The majority of this increase in emissions is due to increases in building energy use, vehicle trips, and off-road equipment. Despite these changes, the overall emissions profile for the 2020 BAU Community Forecast is similar to the 2012 Community Inventory, with building energy, transportation, and agriculture representing the top three sources and a vast majority (93 percent) of emissions.

Table 4.6.C: Marin County 2020 Business as Usual (BAU) Emissions Forecasts

Emission Sector[1]	2020 BAU Forecast		Change in Emissions	
	Emissions (MT CO_2e)	Percent of Inventory	From 1990	From 2012
Building Energy – Residential	115,713	24	-15,552	4,229
Building Energy – Nonresidential	61,194	12	-12,996	6,052
On-road Transportation	167,002	34	-26,542	229
Off-road Vehicles and Equipment	19,823	4	523	2,697
Solid Waste Generation	9,358	2	-5,056	-4
Water Conveyance	1,215	0.2	-104	58
Wastewater Treatment	5,745	1	292	183
Agriculture	110,798	23	-11,568	-52
Marin County Total	**490,848**	**100**	**-71,003**	**13,392**

Notes:
[1] Additional emissions sources that were not estimated (or included in the inventory) include aircraft, non-local passenger rail, freight lines, ferries, ozone depleting substances, and other gases with high global warming potential.
Source: Marin County, 2015.

4.6.2 Regulatory Framework

The federal and State regulatory framework related to greenhouse gas emissions is described below.

4.6.2.1 Federal Regulations

The United States has historically had a voluntary approach to reducing greenhouse gas emissions. However, on April 2, 2007, the United States Supreme Court ruled that the USEPA has the authority

to regulate CO_2 emissions under the federal Clean Air Act. While there currently are no adopted federal regulations for the control or reduction of greenhouse gas emissions, the USEPA commenced several actions in 2009 to implement a regulatory approach to global climate change.

This action includes the 2009 USEPA final rule for mandatory reporting of greenhouse gases from large greenhouse gas emission sources in the United States. Additionally, the USEPA Administrator signed an endangerment finding action in 2009 under the Clean Air Act, finding that six greenhouse gases (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to global climate change, leading to national greenhouse gas emission standards.

4.6.2.2 State Regulations

The California Air Resources Board (ARB) is typically the lead agency for implementing climate change regulations in the State. Many regulations and statutes in California address, both directly and indirectly, greenhouse gas emissions, such as renewable portfolio standards (SB 1078, SB 107, SB 2(1X)) and energy efficiency standards (Title 24, Cal. Code Regs.). Key State regulatory activities specifically addressing climate change and greenhouse gas emissions are discussed below.

Assembly Bill 1493 (2002). In a response to the transportation sector's significant contribution to California's CO_2 emissions, AB 1493 (Pavley) was enacted on July 22, 2002. AB 1493 requires the ARB to set greenhouse gas emission standards for passenger vehicles and light duty trucks (and other vehicles whose primary use is noncommercial personal transportation in the State) manufactured in 2009 and all subsequent model years. These standards (starting in model years 2009 to 2016) were approved by the ARB in 2004, but the needed waiver of CAA Preemption was not granted by the USEPA until June 30, 2009. The ARB responded by amending its original regulation, now referred to as Low Emission Vehicle III, to take effect for model years starting in 2017 to 2025.

Executive Order S-3-05 (2005). Governor Arnold Schwarzenegger signed Executive Order S-3-05 on June 1, 2005, which proclaimed that California is vulnerable to the impacts of climate change. The executive order declared that increased temperatures could reduce snowpack in the Sierra Nevada Mountains, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established California's greenhouse gas emissions reduction targets, which established the following goals:

- Greenhouse gas emissions should be reduced to 2000 levels by 2010;
- Greenhouse gas emissions should be reduced to 1990 levels by 2020; and
- Greenhouse gas emissions should be reduced to 80 percent below 1990 levels by 2050.

The Secretary of the California Environmental Protection Agency (CalEPA) is required to coordinate efforts of various State agencies in order to collectively and efficiently reduce greenhouse gases. A biannual progress report must be submitted to the Governor and State Legislature disclosing the progress made toward greenhouse gas emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply,

public health, agriculture, the coastline, and forestry, and report possible mitigation and adaptation plans to address these impacts.

The Secretary of CalEPA leads this Climate Action Team (CAT) made up of representatives from State agencies as well as numerous other boards and departments. The CAT members work to coordinate statewide efforts to implement global warming emission reduction programs and the State's Climate Adaptation Strategy. The CAT is also responsible for reporting on the progress made toward meeting the statewide greenhouse gas targets that were established in the executive order and further defined under Assembly Bill 32, the "Global Warming Solutions Act of 2006" (AB 32). The first CAT Report to the Governor and the Legislature was released in March 2006, outlining 46 specific emission reduction strategies for reducing greenhouse gas emissions and reaching the targets established in the Executive Order. The CAT Report to the Governor and Legislature will be updated and issued every 2 years thereafter; the most recent was released in December 2010.

Assembly Bill 32 (2006), California Global Warming Solutions Act. California's major initiative for reducing greenhouse gas emissions is AB 32, passed by the State legislature on August 31, 2006. This effort aims at reducing greenhouse gas emissions to 1990 levels by 2020. In response to AB 32, California began to address climate change by employing a comprehensive, long-term approach to cut the State's greenhouse gas emissions to 1990 levels by 2020 and to maintain and continue reductions post 2020.

AB 32 requires the ARB to prepare a Scoping Plan that outlines the main State strategies for meeting the emission reduction targets and to reduce greenhouse gases that contribute to global climate change. Pursuant to AB 32, the Scoping Plan must "*identify and make recommendations on direct emission reduction measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and nonmonetary incentives*" in order to achieve the 2020 goal, and achieve "*the maximum technologically feasible and cost-effective greenhouse gas emission reductions*" by 2020 and maintain and continue reductions beyond 2020.

The Initial Scoping Plan in 2008 presented the first economy-wide approach to reducing emissions and highlighted the value of combining both carbon pricing with other complementary programs to meet California's 2020 greenhouse gas emissions cap while ensuring progress in all sectors. The coordinated set of policies in the Initial Scoping Plan employed strategies tailored to specific needs, including market-based compliance mechanisms, performance standards, technology requirements, and voluntary reductions. The Initial Scoping Plan also described a conceptual design for a cap-and-trade program that included eventual linkage to other cap-and-trade programs to form a larger regional trading program.

AB 32 requires ARB to update the scoping plan at least every 5 years. The First Update to the Scoping Plan (First Update), approved in 2014, presented an update on the program and its progress toward meeting the 2020 limit. It also developed the first vision for the long-term progress that the State endeavors to achieve. In doing so, the First Update laid the groundwork to transition to the post-2020 goals set forth in Executive Orders S-3-059 and B-16-2012.10. It also recommended the need for a 2030 mid-term target to establish a continuum of actions to maintain and continue reductions, rather than only focusing on targets for 2020 or 2050.

Senate Bill 375 (2008). Signed into law on October 1, 2008, SB 375 supplements greenhouse gas reductions from new vehicle technology and fuel standards with reductions from more efficient land use patterns and improved transportation. Under the law, the ARB approved greenhouse gas reduction targets in February 2011 for California's 18 federally designated regional planning bodies, known as Metropolitan Planning Organizations (MPOs). The ARB may update the targets every 4 years and must update them every 8 years. MPOs in turn must demonstrate how their plans, policies and transportation investments meet the targets set by the ARB through Sustainable Community Strategies (SCS). The SCS are included with the Regional Transportation Plan (RTP), a report required by State law. However, if an MPO finds that their SCS will not meet the greenhouse gas reduction target, they may prepare an Alternative Planning Strategy (APS). The APS identifies the impediments to achieving the targets.

Executive Order B-30-15 (2015). Governor Jerry Brown signed Executive Order B-30-15 on April 29, 2015, adding the immediate target of:

- Greenhouse gas emissions should be reduced to 40 percent below 1990 levels.

All state agencies with jurisdiction over sources of greenhouse gas emissions were directed to implement measures to achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 targets. ARB was directed to update the AB 32 Scoping Plan to reflect the 2030 target, and therefore is moving forward with the update process. The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue reducing emissions.

Senate Bill 350 Clean Energy and Pollution Reduction Act (2015). SB 350, signed by Governor Jerry Brown on October 7, 2015, updates and enhances AB 32 by introducing the following set of objectives in clean energy, clean air, and pollution reduction for 2030:

- Raise California's renewable portfolio standard from 33 percent to 50 percent; and
- Increase energy efficiency in buildings by 50 percent by the year 2030.

The 50 percent renewable energy standard will be implemented by the CA Public Utilities Commission for the private utilities and by the CA Energy Commission for municipal utilities. Each utility must submit a procurement plan showing it will purchase clean energy to displace other non-renewable resources. The 50 percent increase in energy efficiency in buildings must be achieved through the use of existing energy efficiency retrofit funding and regulatory tools already available to state energy agencies under existing law. The addition made by this legislation requires state energy agencies to plan for, and implement, those programs in a manner that achieves the energy efficiency target.

Senate Bill 32, California Global Warming Solutions Act of 2016, and Assembly Bill 197 (2016). In the summer of 2016 the Legislature passed, and the Governor signed, Senate Bill 32 (SB 32) and Assembly Bill 197 (AB 197). SB 32 affirms the importance of addressing climate change by codifying into statute the greenhouse gas emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Governor Brown's April 2015 Executive Order B-30-15. SB 32 builds on AB 32

and keeps the State on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels, consistent with an Intergovernmental Panel on Climate Change (IPCC) analysis of the emissions trajectory that would stabilize atmospheric greenhouse gas concentrations at 450 parts per million carbon dioxide equivalent (CO2e) and reduce the likelihood of catastrophic impacts from climate change.

The companion bill to SB 32, AB 197, provides additional direction to ARB on the following areas related to the adoption of strategies to reduce greenhouse gas emissions. Additional direction in AB 197 intending to provide easier public access to air emissions data that are collected by ARB was posted in December 2016.

4.6.2.3 Bay Area Air Quality Management District

The BAAQMD is the regional government agency that regulates sources of air pollution within the nine San Francisco Bay Area counties. The BAAQMD regulates greenhouse gas emissions through the following plans, programs, and guidelines.

Clean Air Plans. BAAQMD and other air districts prepare clean air plans in accordance with the State and federal CAAs. The Bay Area 2017 Clean Air Plan is a comprehensive plan to improve Bay Area air quality and protect public health. The Clean Air Plan defines control strategies to reduce emissions and ambient concentrations of air pollutants; safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily affected by air pollution; and reduce greenhouse gas emissions to protect the climate. The 2017 Clean Air Plan aims to lead the region to a post-carbon economy, to continue progress toward attaining all State and federal air quality standards, and to eliminate health risk disparities from exposure to air pollution among Bay Area communities. The 2017 Clean Air Plan also includes a wide range of proposed control measures to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent greenhouse gases.

BAAQMD Climate Protection Program. The BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the San Francisco Bay Area Air Basin. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy, all of which assist in reducing emissions of greenhouse gas and in reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

BAAQMD CEQA Air Quality Guidelines. The BAAQMD CEQA Air Quality Guidelines were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. The guidelines also include recommended assessment methodologies for air toxics, odors, and greenhouse gas emissions. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update of the CEQA Guidelines. In May 2011, the updated BAAQMD CEQA Air Quality Guidelines were amended to include a risk and hazards threshold for

new receptors and modified procedures for assessing impacts related to risk and hazard impacts. In May 2017, the BAAQMD published an updated version of the CEQA Guidelines, which includes thresholds to evaluate project impacts in order to protectively evaluate the potential effects of the project on air quality. These protective thresholds are appropriate in the context of the size, scale, and location of the project.

Under the 2017 CEQA Air Quality Guidelines, a local government may prepare a Qualified Greenhouse Gas Reduction Strategy that is consistent with AB 32 goals. If a project is consistent with an adopted qualified Greenhouse Gas Reduction Strategy and General Plan that addresses the project's greenhouse gas emissions, it can be presumed that the project will not have significant greenhouse gas emissions under CEQA. The 2017 Guidelines also includes a quantitative threshold for project level analyses based on estimated greenhouse emissions as well as per capita metrics.

4.6.2.4 Marin County

Marin County Countywide Plan. The County of Marin addresses greenhouse gas emissions in the Natural Systems & Agriculture Element of the Marin Countywide Plan.[122] The Countywide Plan includes goals, policies, and implementing programs that promote efficient management and use of resources in order to minimize greenhouse gas emissions and promote resilient human and natural systems in order to ease the impacts of climate change. Policies and implementing programs relevant to this project include the following:

Policy AIR-4.1: Reduce Greenhouse Gas Emissions. Adopt practices that promote improved efficiency and energy management technologies; shift to low-carbon and renewable fuels and zero emission technologies.

> *Implementing Program AIR-4.b: Reduce Greenhouse Gas Emissions Resulting from Transportation.* Increase clean-fuel use, promote transit-oriented development and alternative modes of transportation, and reduce travel demand.
>
> *Implementing Program AIR-4.f: Establish a Climate Change Planning Process.* Continue implementation of the approved Marin County Greenhouse Gas Reduction Plan. Integrate this plan into long-range and current planning functions of other related agencies. Establish and maintain a process to implement, measure, evaluate, and modify implementing programs, using the Cities for Climate Protection Campaign as a model.
>
> *Implementing Program AIR-4.h: Evaluate the Carbon Emissions Impacts of Proposed Developments.* Incorporate a carbon emissions assessment into land use plans and the environmental impact report for proposed projects.
>
> *Implementing Program AIR-4.o: Implement Proposed State Programs to Reduce Greenhouse Gas Emissions.* Implement proposed State programs to reduce greenhouse gas emissions, including the Renewable Portfolio Standards, California Fuel Efficiency (CAFE) standards, and carbon cap and trade programs.

[122] Marin, County of. 2007. *Marin Countywide Plan.* November 6.

Marin County Climate Action Plan. The Marin County Board of Supervisors adopted the Final Climate Action Plan 2015 Update[123] (CAP) on November 10, 2015. The goal of the CAP is two-fold: to reduce community greenhouse gas emissions to 30 percent below 1990 levels and to reduce municipal greenhouse gas emissions to 15 percent below 1990 levels by 2020. The CAP consolidates many of the County's initiatives on climate change and provides a blueprint for a more sustainable future. The actions outlined in the CAP have other benefits beyond reducing greenhouse gas emissions and will improve air quality, reduce traffic congestion, and create new opportunities for walking and biking. The County's 2020 emissions reductions target exceeds larger statewide efforts established by AB 32.

New development proposed within the County can use the CAP to address greenhouse gas impacts and streamline project-level environmental review of climate change under CEQA. The CAP therefore serves as a mechanism to facilitate sustainable development as well as a tool to support community-wide reductions in greenhouse gas emissions.

Marin County can use the CAP to comply with project-level review requirements pursuant to CEQA. CEQA Guidelines specify that CEQA project evaluation of greenhouse gas emissions can "tier from" a programmatic analysis of greenhouse gas emissions, provided that the programmatic analysis (or climate action plan) does the following (CEQA Guidelines Section 15183.5):

- Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area.
- Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable.
- Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within a geographic area.
- Specify measures or a group of measures, including performance standards that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.
- Monitor the plan's progress.
- Adopt the greenhouse gas reduction strategy in a public process following environmental review.

The CAP meets CEQA Guidelines Section 15183.5 listed above by 1) quantifying all primary sectors of greenhouse gas emissions within the County for 1990, 2012, and 2020; 2) including a reduction target of 30 percent below 1990 levels for community emissions, which is above and beyond the recommendations in the AB 32 Scoping Plan for municipalities to support the overall AB 32 reduction targets; 3) analyzing community emissions for the County and including predicted growth expected by 2020; 4) including specific measures to achieve the overall reduction target; 5) including

[123] Marin, County of. 2015. op. cit.

periodic monitoring of plan progress; and 6) submitting the CAP to be adopted in a public process following compliance with CEQA.

Once the CAP is adopted, project-specific environmental documents that incorporate applicable CAP measures can tier from the CAP (and any necessary CEQA documentation for adoption of the CAP) to meet project-level CEQA evaluation requirements for greenhouse gas emissions. Tiering can eliminate the need to prepare a quantitative assessment of project-level greenhouse gas emissions. Rather, project-specific environmental documents that rely on the CAP can qualitatively evaluate greenhouse gas impacts by identifying all applicable CAP measures and describing how those measures have been incorporated into the project design and/or identified as mitigation.

This type of tiered analysis can reduce project costs and streamline the County CEQA process as it relates to greenhouse gas emissions. Projects that demonstrate consistency with applicable CAP actions can be determined to have a less-than-significant cumulative impact on greenhouse gas emissions and climate change (notwithstanding substantial evidence that warrants a more detailed review of project-level greenhouse gas emissions). The CEQA process for all issues other than greenhouse gas emissions would not be affected by the CAP streamlining.

The County retains the discretion to determine the specific CEQA evaluation approach to individual projects. For land use development projects, such as residential, commercial, and mixed-use projects, for which the County's CAP has fully analyzed greenhouse gas emissions and adopted appropriate local greenhouse gas reduction measures, it is likely that the County will evaluate projects for their consistency with the CAP and use that determination of consistency as the significance evaluation for greenhouse gas emissions under CEQA. However, the County may also decide, on a case-by-case basis, to utilize the BAAQMD mass emissions greenhouse threshold (or other thresholds) for certain projects, particularly projects that may not precisely be anticipated in the greenhouse analysis done as part of preparing the CAP.

4.6.2.5 City of Larkspur

City of Larkspur General Plan. The City of Larkspur addresses air quality in the Health and Safety Element of the Larkspur General Plan.[124] The air quality goals, policies, and action programs contained in the General Plan also relate to greenhouse gas emissions. Policies and action programs relevant to this project include the following:

- **Policy R:** Seek to comply with State and federal standards for air quality.
- **Policy S:** Seek to reduce auto travel and, thereby, the pollutants from auto emissions.
    - **Action Program 37**: Require new development to mitigate impacts if the project causes a change in the level of air pollutants by a specified amount.

City of Larkspur Climate Action Plan. The City of Larkspur Climate Action Plan[125] was adopted in June 2010. The purpose of the City's CAP is to compile existing and potential strategies (i.e., actions,

[124] Larkspur, City of. 1990. *Larkspur 1990 General Plan*.
[125] Larkspur, City of. 2010. *City of Larkspur Climate Action Plan*. June.

projects, and programs) that the City's government operations and the community can take to address climate change. It provides a brief background on what climate change is and its potential impacts, but focuses on the efforts the City can take to reduce its greenhouse gas emissions and mitigate, to the extent feasible at the local level, the potential impacts of climate change.

Through actions outlined in the CAP, such as increasing energy efficiency of buildings, encouraging less dependence on the automobile, and using clean, renewable energy sources, the City can experience improved air quality, reduced emissions, and an enhanced quality of life. The City's preparation of a 2005 Greenhouse Gas Emissions Inventory and the CAP is the beginning of an ongoing planning process that includes assessing, planning, mitigating, and adapting to climate change. Specifically the CAP does the following:

- Summarizes the various regulations at the federal, state, and regional levels.
- Incorporates the City's 2005 Greenhouse Gas Emission Inventory, which identified sources of greenhouse gas emissions generated by both the community and the City's government operations.
- Estimates how these emissions may change over time and establishes a target to reduce greenhouse gas emissions to 15 percent below 2005 levels by 2020.
- Provides natural system, energy use, transportation, land use, green purchasing, and waste and water use strategies necessary to minimize Larkspur's impacts on climate change and meet the established greenhouse gas emission's target.

4.6.3 Significance Criteria

Appendix G of the *CEQA Guidelines* indicates that a project would normally have a significant adverse greenhouse gas emission impact if the project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reduction of the emissions of greenhouse gases.

The BAAQMD has further defined these criteria of significance to indicate the project would result in a less-than-significant air quality impact if it would:

- Result in operational-related greenhouse gas emissions of less than 1,100 metric tons of CO_2e a year; or
- Result in operational-related greenhouse gas emissions of less than 4.6 metric tons of CO_2e per service population (residents plus employees).

As discussed above, the BAAQMD's CEQA Guidelines included recommended greenhouse gas evaluation methods and thresholds. The BAAQMD CEQA Guidelines state that a project that is

consistent with a "qualified greenhouse gas reduction strategy" per State CEQA Guidelines Section 15183.5 can be considered less than significant for greenhouse gas emissions. If a project is not consistent with a "qualified greenhouse gas reduction strategy," then the BAAQMD CEQA Guidelines refer to the recommended quantitative greenhouse gas emissions significance threshold of 1,100 $MTCO_2e$ for land use projects and the recommended greenhouse gas "efficiency" significance threshold of 4.6 $MTCO_2e$ per service population.

4.6.4 Impacts and Mitigation Measures

The following discussion analyzes impacts related to greenhouse gas emissions that could result from project implementation. All impacts would be less than significant.

(1) Construction Emissions. Greenhouse gas emissions associated with the project would occur over the short term from construction activities, consisting primarily of emissions from equipment exhaust. Although the project's anticipated emissions from construction activities are quantified herein, in determining the potential significance from such activities, it is important to note the BAAQMD has not established quantified construction greenhouse gas emissions thresholds. The BAAQMD recommends that greenhouse gas emissions are quantified and lead agencies are encouraged to incorporate best management practices to reduce greenhouse gas emissions during construction, as feasible and applicable.[126]

<u>Impact GHG-1</u>: Construction activities associated with the proposed project would produce substantial greenhouse gas emissions. (S)

Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, greenhouse gas emissions would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates greenhouse gases such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The Sacramento Metropolitan Air Quality Management District's Road Construction Emissions Model, Version 6.3.2 (Roadmod) was used to estimate the project's construction-related emissions. Precise details of construction activities are unknown at this time; therefore, default assumptions (e.g., construction fleet activities) from Roadmod were assumed. Construction of the proposed project would occur over a period of 24 months. Model output sheets with calculation details are included in Appendix E.

Using Roadmod, it is estimated that total project construction activities would emit approximately 1,729 metric tons of CO_2e. When considered over the 30-year life of the project, the amortized construction emissions would be 57.6 metric tons of CO_2e per year, which is well below the annual operational threshold of 1,100 metric tons per year established by the BAAQMD. The project's impacts would be considered significant and in conflict with the County's CAP if the project does not

[126] BAAQMD, 2017. Op. Cit.

incorporate all feasible means to reduce greenhouse gas emissions during construction activities. Implementation of Mitigation Measures GHG-1a and GHG-1b would require the project to implement all feasible measures recommended by the BAAQMD to reduce construction-related greenhouse gas emissions.

> Mitigation Measure GHG-1a: Implement Mitigation Measure AIR-1, which requires implementation of BAAQMD's Basic Construction Mitigation Measures to reduce diesel PM exhaust emissions as well as construction dust (PM_{10} and $PM_{2.5}$), which contribute to greenhouse gas emissions.
>
> Mitigation Measure GHG-1b: The County of Marin and the project contractor shall ensure the following measures are implemented through all construction contracts and specifications for the project:
>
> - The idling time of diesel powered construction equipment shall be minimized to 2 minutes.
> - Low VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings) shall be used.
> - All construction equipment, diesel trucks, and generators shall be equipped with Best Available Control Technology for emission reductions of NO_x and PM.
> - All contractors shall use equipment that meets the ARB's most recent certification standard for off-road heavy-duty diesel engines.
> - The project contractor shall use construction equipment that utilizes cleaner fuel and equipment. (LTS)

Significance After Implementation. Implementation of Mitigation Measures GHG-1a and GHG-1b would incorporate all feasible means to reduce greenhouse gas emissions during the construction period to the extent feasible. Therefore, the project's construction-related impacts associated with greenhouse gas emissions would be considered less than significant.

(2) Operational Emissions. The proposed project would rehabilitate an existing roadway, including roadway repaving, intersection geometry and striping modifications, installation of pedestrian, bicyclist, and Americans with Disabilities Act (ADA) improvements, installation of drainage improvements, and replacement and installation of water supply mains.

Since the proposed project includes improvements that would maintain and improve travel efficiency on Sir Francis Drake Boulevard, the project would not result in an increase in vehicular trips through the project area. Therefore, once completed, the proposed project would not generate any greenhouse gas emissions or result in any new vehicle trips that would contribute to an increase in greenhouse gas emissions. In addition, implementation of the proposed project would result in decreased traffic congestion and idling time along the project corridor; therefore the project is expected to generate similar or reduced greenhouse gas emissions than what would occur under existing conditions. Therefore, greenhouse gas emissions generated by the proposed project would be less than significant. No mitigation is required.

(3) Consistency with Plans. The County's CAP meets the BAAQMD requirements for a Qualified Greenhouse Gas Reduction Strategy and, therefore, the significance of the project's impacts is based on the project's compliance with the measures identified in the County's CAP. Any project relying on the County's CAP for CEQA purposes must demonstrate consistency with the County's CAP.

The project's greenhouse gas emissions would not be considered a significant impact if the project would be consistent with the strategies included in the County's CAP. The majority of the County's CAP strategies are specific to development projects; however, some of the strategies would be applicable to the proposed project. Therefore, this analysis evaluates the project's consistency with the County's CAP. In addition, a portion of the proposed project is located within the City of Larkspur; therefore, this analysis also evaluates the project's consistency with the City of Larkspur's CAP. The project's consistency with the relevant CAP strategies is discussed below in Table 4.6.D.

Table 4.6.D: Project Consistency with Climate Action Plan Strategies

Climate Action Plan Strategy	Project Compliance with Strategy
Marin County Climate Action Plan Strategies	
Energy Efficiency and Renewable Energy	
Energy-2.3. Shade Tree Planting. Plant at least 310 shade trees per year.	***Consistent.*** The proposed project would replace any landscaping disrupted by the proposed project.
Transportation and Land Use	
Trans-1.1. Promote Mixed-Use, Infill, and Transit-Oriented Developments. Promote longstanding Countywide Plan growth control strategy of focusing new development in the city center corridor through mixed-use, infill, and transit-oriented developments in downtown neighborhoods, transit-hubs, and transit corridors.	***Consistent.*** The proposed project would include various improvements to enhance pedestrian safety, including relocating the transit stop near Kentfield Fire Station, reducing crossing distances, modifying intersections, and widening sidewalks. In addition, the proposed project would improve access for bicyclists. These improvements are consistent with transit-oriented measures.
Trans-1.2. Vehicle miles traveled (VMT) Reduction Monitoring and Implementation and Transportation Demand Management. Require performance thresholds for reducing the VMT 20 percent below BAU levels in new developments.	***Consistent***. The proposed project would improve pedestrian, bicyclist, and transit facilities, which would promote initiatives to reduce vehicle trips and VMT and would increase the use of alternate means of transportation.
Trans-2. Expand Transit Service. Expand local and regional bus service in range and/or frequency where service expansion would result in higher bus occupancy and lower greenhouse gas emissions per passenger mile than for average passenger vehicle.	***Consistent.*** The proposed project would improve transit facilities, including revising the location of the existing bus stop located along the north side of Sir Francis Drake Boulevard just east of Maple Avenue. By relocating the transit stop to the next block just east of Elm Avenue, pedestrians would cross Sir Francis Drake Boulevard at a signalized intersection. In addition, the College of Marin has agreed to provide right-of-way to create the transit stop.
Water Conservation and Wastewater Treatment	
Water/Wastewater-1.1. Senate Bill X7-7. 20 percent reduction in urban per capita use.	***Consistent.*** The proposed project would be required to comply with Senate Bill X7-7.
Water/Wastewater-2. Increase Pump Efficiency. 10 percent reduction in water-related energy use by 2020.	***Consistent.*** The proposed project would replace a total of 10,100 feet of existing 12-inch cast iron and 14-inch steel potable water pipeline with 12-inch and 18-inch welded steel pipe. These replacements would improve water pressure and flow and enhance the reliability of the water system.

Table 4.6.D: Project Consistency with Climate Action Plan Strategies

Climate Action Plan Strategy	Project Compliance with Strategy
City of Larkspur Climate Action Plan	
Natural Systems, Carbon Sequestration, and Emissions Offset	
Measure 3.2.C1: Increase Trees and Vegetation for a Net Gain of 100 Trees.	***Consistent.*** The proposed project would replace any landscaping disrupted by the proposed project.
Land Use and Transportation	
Measure 3.3.C1: Encourage Compact, Transit-oriented Development	***Consistent.*** The proposed project would include various improvements to enhance pedestrian safety, including relocating the transit stop near Kentfield Fire Station, reducing crossing distances, modifying intersections, and widening sidewalks. In addition, the proposed project would improve access for bicyclists. These improvements are consistent with transit-oriented measures.
Measure 3.3.C2: Increase Walking and Biking for Local Trips	***Consistent.*** The proposed project would include various improvements to enhance pedestrian safety, including relocating the transit stop near Kentfield Fire Station, reducing crossing distances, modifying intersections, and widening sidewalks. In addition, the proposed project would improve access for bicyclists.
Measure 3.3.C3: Increase Public Transit Use	***Consistent.*** The proposed project would improve transit facilities, including revising the location of the existing bus stop located along the north side of Sir Francis Drake Boulevard just east of Maple Avenue. By relocating the transit stop to the next block just east of Elm Avenue, pedestrians would cross Sir Francis Drake Boulevard at a signalized intersection. In addition, the College of Marin has agreed to provide right-of-way to create the transit stop.
Water and Wastewater	
Measure 3.7.G1: Upgrade and Retrofit Water and Wastewater Pumps	***Consistent.*** The proposed project would replace a total of 10,100 feet of existing 12-inch cast iron and 14-inch steel potable water pipeline with 12-inch and 18-inch welded steel pipe. This replacement would improve water pressure and flow and enhance the reliability of the water system.
State Actions	
Measure 3.8.C2: AB 1493 Pavley Standards	***Consistent.*** Any vehicle associated with the proposed project would be required to comply with AB 1493 Pavley Standards.
Measure 3.8.C3: Low Carbon Fuel Standard	***Consistent.*** Vehicles that use Sir Francis Drake Boulevard would be required to comply with the standard, by way of consuming transportation fuel that will meet the goal of a 10 percent reduction in carbon intensity by 2020.

Source: LSA Associates, Inc., 2017.

As demonstrated in Table 4.6.D, the proposed project would be consistent with the County of Marin CAP and the City of Larkspur CAP. The proposed project would not result in a substantial increase in greenhouse gas emissions and, therefore, would be consistent with the CAP and would not result in substantial emissions that would exceed the project-level significance criteria established by the BAAQMD. Therefore, the proposed project would not conflict with plans, policies, or regulations adopted for the purpose of reducing greenhouse gas emissions. In addition, the proposed project

would not result in a substantial increase in greenhouse gas emissions. Therefore, the proposed project would not conflict with the City's CAP.

4.7 HAZARDS AND HAZARDOUS MATERIALS

This section describes hazardous materials and other hazards to public health and safety that could result from implementation of the proposed project. The public safety concerns discussed below include potential exposure to hazardous materials in the soil, soil gas, and groundwater; wildland fire hazards; emergency response and evacuation plans; and aviation hazards.

The term "hazardous material" is defined in this section as any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment.[127] The term "hazardous waste" generally refers to a hazardous material that has been used for its original purpose and is about to be discarded or recycled.

4.7.1 Setting

This section describes existing conditions in the project vicinity and summarizes pertinent federal, state, and local agency laws, regulations, and programs related to hazards and hazardous materials.

4.7.1.1 Hazardous Material Release Sites

Based on review of the State Water Resources Control Board's (State Water Board's) *GeoTracker* database and Department of Toxic Substances Control's *EnviroStor* database, four hazardous materials release sites are located adjacent to the proposed project that have resulted in groundwater contamination.[128,129] The primary contaminants of concern at each release site are petroleum hydrocarbons from leaking underground storage tanks. While all four of the hazardous materials release sites have been closed (i.e., cleanup is complete), residual groundwater contamination could potentially migrate beneath the proposed project. Groundwater may be within 5 feet of the ground surface in lower-lying portions of the project, such as near Highway 101 and Wolfe Grade. [130] Based on review of regulatory databases, soil contamination beneath SFDB has not been reported in the project vicinity.

4.7.1.2 Lead-Based Paint

Prior to 1997, the California Department of Transportation (Caltrans) used lead-based paint (LBP) for yellow traffic stripe and pavement markings along roadways.[131] The debris produced during the removal of yellow thermoplastic and yellow paint may need to be disposed of as a state or federal hazardous waste if the concentrations of lead exceed applicable hazardous waste thresholds.

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127 Abbreviated from California Health and Safety Code Section 25501.

128 State Water Resources Control Board, 2017. *GeoTracker*. https://geotracker.waterboards.ca.gov/. Accessed: June 6, 2017.

129 Department of Toxic Substances Control, 2017. *Envirostor*. https://www.envirostor.dtsc.ca.gov/public/. Accessed: June 6, 2017.

130 Miller Pacific Engineering Group, 2017. *Geotechnical Investigation Report, Sir Francis Drake Boulevard, MMWD Pipeline Replacement Project, Larkspur and Kentfield, California*. June 16.

131 California Department of Transportation (Caltrans), 2012. *Guidance for SSP 14-11.07 – Remove Yellow Traffic Stripe and Pavement Marking with Hazardous Waste Residue*. December 14.

4.7.1.3 Naturally Occurring Asbestos

Geologic mapping from the United States Geological Survey does not show any areas of rock likely to contain naturally occurring asbestos (ultramafic rock) on the project site.[132]

4.7.1.4 Schools

A review of federal records for public and private schools with grades ranging from pre-kindergarten to 12 indicates that four schools are located within 0.25 mile of the proposed project, as shown in Table 4.7.A.[133]

Table 4.7.A: Schools within 0.25 Mile of the Project

Type	Lowest Grade	Highest Grade	School Name
Public School	K	8	Ross Elementary School
Public School	K	4	Anthony G. Bacich Elementary School
Public School	5	8	A.E. Kent Middle School
Private School	9	12	Marin Catholic High School

Source: National Center for Education Statistics, 2017.
Note: K = kindergarten

4.7.1.5 Aviation Hazards

According to the Federal Aviation Administration, Gnoss Field is the only public-use airport in Marin County.[134] The Marin County Airport Land Use Commission has adopted the *Airport Land Use Plan* to help review and approve proposed developments within the areas surrounding Gnoss Field.[135] The proposed project is about 12 miles south of the Gnoss Field, and is outside of aviation safety zones defined in the *Airport Land Use Plan*.

According to the Federal Aviation Administration, the nearest private airstrip to the proposed project is the San Rafael Airport, located about 1.6 miles to the east.[136] Based on guidance from the California Division of Aeronautics, the proposed project is located outside of aviation safety zones of the San Rafael Airport.[137]

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132 Van Gosen, B.S., and J.P. Clinkenbeard, 2011. *Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California.* U.S. Geological Survey Open-File Report 2011-1188.

133 National Center for Education Statistics, 2017. *School Search Tool for Public and Private Schools*. http://nces.ed.gov/ccd/schoolsearch/. Accessed: June 15.

134 Federal Aviation Administration, 2017. *Airport Contacts Information – County of Marin*. Last updated: May 25. http://www.faa.gov/airports/airport_safety/airportdata_5010/. Accessed: June 15.

135 Marin County Airport Land Use Commission, 1991. *Airport Land Use Plan; Marin County Airport Gnoss Field*. June 10.

136 *Ibid.*

137 Lamphier – Gregory, 2009. *San Rafael Airport Recreational Facility, Draft Environmental Report*. SCH No. 2006012125. March.

4.7.1.6 Wildland Fire Hazards

The California Department of Forestry and Fire Protection (CAL FIRE) has mapped Very High Fire Hazard Severity Zones in Marin County to help responsible local agencies, such as the Larkspur Fire Department, identify measures to reduce the potential for loss of life, property, and resources from wildland fire. The proposed project is not mapped within or adjacent to a Very High Fire Hazard Severity Zone.[138]

4.7.2 Regulatory Framework

The proper management of hazardous materials is a common concern for all communities. Beginning in the 1970s, governments at the federal, state, and local levels became increasingly concerned about the effects of hazardous materials on human health and the environment. Numerous laws and regulations were developed to investigate and mitigate these effects. As a result, the storage, use, generation, transport, and disposal of hazardous materials are highly regulated by federal, state, and local agencies. These agencies, as well as the laws, regulations, and programs they administer, are summarized below.

4.7.2.1 Federal and State Regulations

Hazardous Materials Management. The U.S. Environmental Protection Agency (USEPA) is the lead agency with responsibility for enforcing federal laws and regulations that govern hazardous materials that can affect public health or the environment. The major federal laws and regulations pertaining to the management of hazardous materials on the project site are the Resource Conservation and Recovery Act (RCRA) and Toxic Substances Control Act (TSCA).

In 1976, RCRA was enacted to provide a general framework for USEPA to regulate hazardous waste from the time it is generated until its ultimate disposal. Under RCRA, a waste may be considered "hazardous" if it exhibits certain hazardous characteristics (ignitability, corrosivity, reactivity, or toxicity) or if it is included on a specific list of wastes that USEPA has determined are hazardous. In accordance with RCRA, facilities that generate, treat, store, or dispose of hazardous waste are required to ensure that the wastes are properly managed from "cradle to grave" by complying with the federal waste manifest system. In California, the DTSC administers the RCRA program, as well as additional state-specific requirements for managing hazardous waste in accordance with the California Hazardous Waste Control Law (Health & Safety Code § 25100 et seq.). The state criteria for identifying hazardous waste, as described in Title 22 of the California Code of Regulations Sections 66261.10–66261.24, are more comprehensive than the federal RCRA hazardous waste criteria; therefore, hazardous wastes in California can be identified as either RCRA hazardous waste or non-RCRA hazardous waste.

In 1976, the TSCA was enacted to provide USEPA with the authority to regulate the production, importation, use, and disposal of chemicals that pose a risk to public health and the environment. TSCA and subsequent amendments give USEPA authority to regulate the cleanup and/or abatement

[138] California Department of Forestry and Fire Protection (CAL Fire), 2008. *Marin County Very High Fire Hazard Severity Zones in Local Responsibility Area*. October.

of sites with specific toxic chemicals, such as polychlorinated biphenyls, asbestos-containing materials, and LBP.

In California, hazardous waste and materials handling are regulated under the Unified Program. The Unified Program consolidates the administrative requirements, permits, inspections, and enforcement activities for the following existing programs.

- Hazardous Waste Generator and Tiered Permitting Program (Health & Safety Code Chapter 6.5).
- Underground Storage Tank Program (Health & Safety Code Chapter 6.7).
- Aboveground Petroleum Storage Tank Program (Health & Safety Code Chapter 6.67).
- California Accidental Release Prevention Program (Health & Safety Code Chapter 6.95).
- Hazardous Materials Release Response Plan and Inventory Program (Health & Safety Code Chapter 6.95).
- Hazardous Material Management Plan and Hazardous Material Inventory Statement Program (California Fire Code and Health & Safety Code Chapter 1).

The Unified Program requires facilities to properly manage hazardous materials and disclose information regarding such materials to minimize the risk of a hazardous materials release and improve emergency response actions in the event of a release. The California Environmental Protection Agency (CalEPA) oversees the entire program and local government agencies, known as Certified Unified Program Agencies (CUPA), implement and enforce the elements of the Unified Program. The following state agencies are involved with the Unified Program: CalEPA, DTSC, the Governor's Office of Emergency Services, and the Office of the State Fire Marshal.

Worker Health and Safety. The Occupational Health and Safety Administration (OSHA) is the federal agency with responsibility for enforcing and implementing federal laws and regulations pertaining to worker health and safety. OSHA's Hazardous Waste Operations and Emergency Response regulations require training and medical supervision for workers at hazardous waste sites.[139] Additional regulations have been developed regarding exposure to lead[140] and asbestos[141] to protect construction workers.

State worker health and safety regulations related to construction activities are enforced by the California Division of Occupational Safety and Health (Cal/OSHA). These regulations include requirements for protective clothing, training, and limits on exposure to hazardous materials. Cal/OSHA also enforces occupational health and safety regulations specific to lead and asbestos investigation and abatement. These regulations equal or exceed their federal counterparts. Specific

[139] Code of Federal Regulations [C.F.R.] Title 29, § 1910.120
[140] C.F.R. Title 29, § 1926.62
[141] C.F.R. Title 29, § 1926.1101

worker safety measures for excavation hazards (e.g., falling or cave-in of the excavation wall) are described in the California Code of Regulations, Title 8, § 1541.

Hazardous Materials Transportation. In 1990 and 1994, the federal Hazardous Material Transportation Act was amended to strengthen regulations for protecting life, property, and the environment from the inherent risks of transporting hazardous material. Furthermore, the U.S. Department of Transportation (USDOT) developed hazardous materials regulations pertaining to classification, packaging, transport, and handling as well as regulations regarding employee training and incident reporting.[142] The transport of hazardous materials is subject to both RCRA and USDOT regulations.

The California Highway Patrol, Caltrans, and DTSC are responsible for enforcing federal and state regulations pertaining to the transport of hazardous materials. If a discharge or spill of hazardous materials occurs during transportation, the transporter is required to take appropriate immediate action to protect human health and the environment (e.g., notify local authorities and contain the spill); the transporter is also responsible for cleanup.[143]

Hazardous Materials Release Sites. In California, USEPA has granted most enforcement authority of federal hazardous materials regulations to the California Environmental Protection Agency (CalEPA). Under the authority of CalEPA, the State Water Board and DTSC are responsible for overseeing the remediation of contaminated soil and groundwater sites. The provisions of Government Code Section 65962.5 (also known as the Cortese List) require the State Water Board, DTSC, the California Department of Health Services, and the California Department of Resources Recycling and Recovery to submit information to CalEPA pertaining to sites that are associated with solid waste disposal, hazardous waste disposal, and/or hazardous materials releases.

Lead-Based Paint. Exposure to lead, a state-recognized carcinogen, can result in stomach and lung cancer and impair nervous, renal, cardiovascular, and reproductive systems. Loose and peeling LBP must be disposed of as a state and/or federal hazardous waste if the concentration of lead equals or exceeds applicable waste thresholds. State and federal OSHA regulations require a supervisor who is certified with respect to identifying existing and predictable lead hazards to oversee air monitoring and other protective measures during demolition activities in areas where LBP may be present. Special protective measures and notification of Cal/OSHA are required for highly hazardous construction tasks related to lead, such as manual demolition, abrasive blasting, welding, cutting, or torch burning of structures, where LBP is present.

Wildland Fire Protection. In accordance with California Public Resource Code Sections 4201–4204 and Government Code Sections 51175–51189, CAL FIRE has mapped areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones, represent the risks associated with wildland fires. Fire Hazard Severity Zones mapped by CAL FIRE for state and local responsibility areas are classified as either “medium,” “high,” or “very high” based on fire hazards; however, the law requires only identification of Very High Fire

[142] C.F.R. Title 49, § 171–180
[143] California Code of Regulations, Title 22, § 66260.10 et seq.

Hazard Severity Zones in local responsibility areas. Wildland-Urban Interface Areas designated by local agencies are also classified as Fire Hazard Severity Zones.

4.7.2.2 Bay Area Air Quality Management District

Hazardous and Acutely Hazardous Emissions. The Bay Area Air Quality Management District (BAAQMD) oversees the protection of air quality in the San Francisco Bay Area Air Basin, which includes the project site. Hazardous and acutely hazardous emissions during construction and facility operations are subject to health risk assessment regulations and permitted conditions of operation to protect nearby sensitive receptors.

4.7.2.3 Marin County

Emergency Response and Evacuation. In 2012, the Marin County Sheriff's Office of Emergency Services updated the County's Hazard Mitigation Plan in coordination with ABAG planning efforts.[144] Hazard impacts in the region were identified based on ABAG's Local Hazard Mitigation Plan and the impacts of the major threats (earthquake, wildfire, and flood) were further developed based on past disasters and projected future impacts. The Hazard Mitigation Plan also identifies tasks for cities to integrate hazard mitigation into their planning processes.

The City of Larkspur's All-Hazard Mitigation Plan provides specific mitigation strategies for hazards identified in the Hazard Vulnerability Analysis, which considers natural, technological, and human-caused risks to which Larkspur and its political subdivision are vulnerable.[145]

In January 2012, the Town of Ross adopted the Local Hazard Mitigation Plan based on the review of the Town of Ross General Plan 2007 – 2025 and the Association of Bay Area Governments' (ABAG) multi-jurisdictional Local Hazard Mitigation Plan. [146] The Town of Ross identified natural hazards to which the City is susceptible, such as wildfire and landslides, and developed the Emergency Operation Plan to ensure the effective management of response forces and resources to respond to these natural hazards.

The Kentfield/Greenbrae Community adopted a Community Plan in 1987.[147] The Community Plan addresses possible environmental hazards such as wildland fires and air pollution, and refers to the Marin County Plan for policies and regulations on environmental hazards consistent with the desires of the Kentfield/Greenbrae Community.

Marin Countywide Plan. The Countywide Plan is a comprehensive long-range general plan for the unincorporated areas of Marin County, which includes the Kentfield/Greenbrae Community. [148] The following policies and programs from the Marin Countywide Plan apply to the proposed project:

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144 Marin County, 2012. *Local Hazard Mitigation Plan*. October 16.

145 City of Larkspur, 2014. *All-Hazard Mitigation Plan, Version 2.0.* http://hazardmitigation.calema.ca.gov/docs/lhmp/Larkspur_City_ofl.pdf. Accessed: June 16, 2017.

146 Town of Ross, 2012. *Local Hazard Mitigation Plan*. January 12.

147 Kentfield/Greenbrae, 1987. *Kentfield/Greenbrae Community Plan*. May.

148 Marin County, 2007. *Marin Countywide Plan.* November 6.

Goal EH-4: Safety from Fires. Protect people and property from hazards associated with wildland and structural fires.

Policy EH-4.1: Limit Risks to Structures. Ensure that adequate fire protection is provided in new development and when modifications are made to existing structures.

Policy EH-4.3: Adopt and Implement a Fire Management Plan. Develop a proactive approach to manage wildfire losses by identifying hazard risks and enacting effective mitigation strategies.

Policy EH-4.5: Regulate Land Uses to Protect from Wildland Fires. Use land use regulations, including but not limited to subdivision approvals and denials, as means of protecting people and property from hazards associated with wildland fires.

Kentfield/Greenbrae Community Plan. The Community Plan refers to the Marin Countywide Plan for specific policies and regulations on environmental hazards.

4.7.2.4 City of Larkspur

City of Larkspur General Plan. The following policies and programs from the Larkspur General Plan apply to the proposed project: [149]

Circulation Element

Goal 4: Improved local or regional transit service should not negatively affect Larkspur.

Policy b: Remove hazards from the traffic system.

Health and Safety Element

Goal 1: Increase public awareness of flooding, seismic, landslide, fire, and other natural hazards, and of methods to avoid or mitigate the effects of these hazards.

Goal 2: Prepare to make a planned, coordinated response to a disaster.

Goal 3: Avoid development in areas prone to natural hazards.

Policy e: Allow land uses in areas prone to natural hazards only with appropriate mitigation.

Action Program [6]: Continue to regulate development to assure the adequate mitigation of safety hazards on sites having a history or threat of slope instability, seismic activity (including liquefaction, subsidence, and differential settlement), flooding, or fire.

Goal 7: Protect Larkspur residents and property from fire hazards.

Goal 8: Minimize the risk of wildland and structural fires, and ensure adequate fire protection.

[149] City of Larkspur, 1990. *City of Larkspur, CA, General Plan*. http://www.ci.larkspur.ca.us/152/General-Plan. Accessed: June 16, 2017.

Goal 9: Protect Larkspur from accidental exposure to hazardous materials from spills, leaks, vapor releases, and improper or illegal storage and disposal.

Action Program [35]: Closely monitor and enforce regulations concerning the use and handling of hazardous materials.

Action Program [36]: Require transporters of hazardous materials to notify the City before moving such materials along City streets.

4.7.3 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact related to hazards and hazardous materials if it would:

- Create a significant hazard to public health or the environment through the routine transport, use, or disposal of hazardous materials.
- Create a significant hazard to public health or the environment through reasonably foreseeable upset or accident conditions involving the release of hazardous materials into the environment.
- Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, creates a significant hazard to the public or the environment.
- For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area.
- For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area.
- Impair or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including areas where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to hazards and hazardous materials if it would:

- Pose a public health and safety hazard through release of emissions or risk of upset.
- Interfere with emergency response plans or emergency evacuation plans.

- Expose sensitive receptors to substantial pollutant concentrations.
- Result in unsafe conditions for employees, visitors, or students.

4.7.4 Impacts and Mitigation Measures

The following discussion analyzes impacts related to hazards and hazardous materials that could result from implementation of the proposed project. All impacts would be less than significant after mitigation.

(1) Routine Management of Hazardous Materials. Project construction activities are expected to involve the routine transport, use, and disposal of hazardous materials (e.g., fuels, paints, and lubricants) that could pose a significant threat to human health or the environment if not property managed. Small amounts of these materials are typically used in construction projects, but they are not considered acutely hazardous. Workers who handle hazardous materials are required to adhere to OSHA and Cal/OSHA health and safety requirements. Hazardous materials must be transported to and from the project site in accordance with RCRA and USDOT regulations, and hazardous wastes must be disposed of in accordance with RCRA regulations at a facility that is permitted to accept the waste.

Operation and maintenance activities associated with the proposed project would also include the routine transport, use, and disposal of hazardous materials. However, the volume of hazardous materials transported through the project area would be similar to existing conditions, because the proposed project would not increase the capacity of SFDB. Furthermore, hazardous materials must be transported in accordance with RCRA and USDOT regulations.

Because compliance with existing regulations is mandatory, construction and operation of the proposed project would not be expected to create a significant hazard to public health or the environment through the routine transport, use, or disposal of hazardous materials. As a result, impacts related to the routine transport, use, or disposal of hazardous materials during project construction and operation would be less than significant.

(2) Accidental Hazardous Materials Releases. The accidental release of hazardous materials during project construction and operation activities could pose a significant threat to human health or the environment. As described above, the use of hazardous materials would be subject to existing hazardous materials regulations and adherence to these standards would reduce the potential for an accidental release. In addition, a Stormwater Pollution Prevention Plan (SWPPP) must be prepared and implemented during project construction for coverage under the Construction General Permit, in accordance with the requirements of the State Water Board. As detailed in Section 4.9, *Hydrology and Water Quality*, the SWPPP requires implementation of best management practices for hazardous materials storage and soil stockpiles, inspections, maintenance, training of employees, and containment of releases to prevent runoff into existing stormwater collection systems or waterways. Because compliance with existing regulations is mandatory, accidental hazardous materials releases during construction and operation would have a less-than-significant impact on human health and/or the environment.

(3) Emission or Handling of Hazardous Materials within 0.25 mile of a School. The handling or emission of hazardous or acutely hazardous materials near schools must consider potential health effects on children, who are considered sensitive receptors. There are four existing schools within 0.25 mile of the proposed project. The only plausible exposure pathway of concern for children at nearby schools is through the inhalation of air contaminants, such as particulate matter.

As discussed in Section 4.2, *Air Quality*, sources of hazardous emissions during project construction and operation would include diesel particulate matter from vehicle exhaust. Implementation of Mitigation Measure AIR-1 would require implementation of the BAAQMD's Basic Construction Mitigation Measures and would reduce diesel PM exhaust emissions as well as construction dust (PM_{10} and $PM_{2.5}$) impacts to a less-than-significant level.

As discussed above, hazardous materials used during project construction and operation would be managed in accordance with applicable laws and regulations. No acutely hazardous materials would be used during project construction or operation. Therefore, the handling or emission of hazardous or acutely hazardous materials during project construction and operation would have a less-than-significant impact on nearby schools.

(4) Included on a List of Hazardous Materials Sites. No hazardous materials release sites are located on the proposed project site that meet the criteria specified in Government Code Section 65962.5 (also known as the Cortese List). Therefore, the proposed project would have no impact related to development on a hazardous materials release site included on the Cortese List.

(5) Aviation Hazards. The proposed project is not located within the safety zones of a public-use airport or a private airstrip. Therefore, the project would have no impact on the navigable airspace of public-use airports or private airstrips and would not pose a related safety hazard for people residing or working in the project area.

(6) Emergency Response or Evacuation Plan. During an emergency response or evacuation, SFDB would likely be used as the primary means of ingress and egress for cities and towns in the project vicinity. The proposed project would reduce traffic congestion and improve operations along SFDB; however, project construction could result in temporary traffic delays along SFDB. As discussed in Section 3.5.6, *Construction Phasing and Schedule*, construction activities would undergo careful scheduling to minimize delays, including nighttime construction for specific activities. Therefore, construction and operation of the proposed project would have a less-than-significant impact related to the impairment or interference of local emergency operation and/or evacuation plans.

(7) Wildland Fire Hazards. The proposed project is surrounded by urban development and is not mapped in or adjacent to a Very High Fire Severity Zone. Therefore, the proposed project would have no impact related to wildland fire hazards.

(8) Contamination from Adjacent Hazardous Materials Release Sites. Pavement rehabilitation activities for the proposed project could include the removal of yellow traffic stripe and pavement markings that potentially contain LBP. Excavation and dewatering activities for the proposed project could encounter residual groundwater contamination, particularly during pipeline

replacement activities, from four leaking underground storage tank sites located adjacent to the project site. Extensive dewatering could also cause the migration of off-site contaminants into the construction area.

Impact HAZ-1: Project construction activities could encounter lead-based paint and residual groundwater contamination from adjacent hazardous materials release sites (S).

The disturbance of LBP and/or contaminated groundwater during project construction could have a potentially significant impact on the health of the workers and the environment.

> Mitigation Measure HAZ-1: Prior to construction, the contractor shall prepare a Construction Risk Management Plan (CRMP) to protect construction workers, the general public, and the environment from hazardous materials that could be disturbed during roadway rehabilitation and trench dewatering activities. The CRMP shall be reviewed and approved by Marin County Department of Public Works prior to the start of construction. The CRMP shall include specific construction worker health and safety requirements and procedures for managing hazardous materials in accordance with applicable laws, regulations, and permit requirements. The CRMP shall also include contingency measures in case unknown contamination is encountered during construction. The CRMP shall specifically include the following:
>
> - Procedures for testing and managing lead-based paint in yellow paint striping and markings that will be disturbed on existing roadways (if any);
> - Procedures for storing extracted groundwater, if any, adjacent to former leaking underground storage tank sites in Baker tank(s) until chemically characterized to determine the appropriate treatment requirements (if necessary) for discharge or disposal;
> - Procedures for identifying, testing, and managing soil and groundwater suspected of containing hazardous materials (if any) that have not previously been identified at the site; and
> - Identification of personnel responsible for implementation of the CRMP. (LTS)

Significance After Implementation. Implementation of Mitigation Measure HAZ-1 would reduce impacts related to the potential extraction of residual groundwater contamination to less than significant.

4.8 HYDROLOGY AND WATER QUALITY

This section describes the existing hydrology setting for the project, including runoff, drainage, flood hazards, and water quality, based on available information provided as part of the project description and published reports.

4.8.1 Setting

This subsection describes the existing hydrological setting at and near the proposed project. For the purposes of this analysis, the study area for hydrology and water quality includes the groundwater basin and watershed that the project alignment traverses.

4.8.1.1 Stormwater Runoff and Drainage

Marin County has a mild Mediterranean climate with long, dry, warm summers and cool, rainy winters. The proposed project is located in the Ross Valley Watershed, receiving over 50 inches of rain annually.[150] Stormwater runoff from the paved areas of SFDB on the project site either infiltrates into adjacent vegetation and swales or collects in storm drains and culverts that discharge to Corte Madera Creek, which flows into the Central San Francisco Bay.

4.8.1.2 Surface Water Quality

According to the *San Francisco Bay Basin Water Quality Control Plan* (Basin Plan), Corte Madera Creek supports the following existing beneficial uses for surface water: commercial and sport fishing; cold freshwater habitat; fish migration; fish spawning; warm freshwater habitat; wildlife habitat; water contact recreation; noncontact water recreation; and navigation. The Central San Francisco Bay provides all of the beneficial uses discussed above with the exception of cold and warm freshwater habitat, and also provides the beneficial uses of industrial and process water supply, shellfish harvesting, and estuarine habitat.[151]

Pursuant to Section 303(d) of the Clean Water Act, the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) has listed Corte Madera Creek as an impaired water body for the pesticide diazinon. Urban runoff is listed as the potential source of diazinon in Corte Madera Creek. The Central San Francisco Bay has also been listed as an impaired water body for pesticides, heavy metals, dioxins, furans, polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers, and trash.[152] Total Maximum Daily Loads (TMDLs) have been established for Corte Madera Creek and the Central San Francisco Bay that describe the maximum amount of a pollutant that the water bodies can receive while still meeting water quality standards. Once a TMDL has been developed, they are implemented by allocating wasteloads via National Pollutant Discharge Elimination System (NPDES) permits. The regulatory framework for designating impaired water bodies, establishing TMDLs, and NPDES permits is discussed under the Regulatory Framework section below.

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150 Marin County Watershed Program, 2017. *Ross Valley Watershed*. http://www.marinwatersheds.org/ross_valley.html. Accessed on June 22.

151 San Francisco Bay Regional Water Quality Control Board (Regional Water Board), 2017. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*. May 4.

152 State Water Resources Control Board, 2012. *Final 2012 California Integrated Report (Clean Water Act Section 303(d) list/305(b) Report)*. 2012 California 303(d) List of Water Quality Limited Segments

4.8.1.3 Groundwater Quality

The Ross Valley Groundwater Basin underlies the project site and is listed in the Basin Plan as having the potential to support the beneficial uses of municipal and domestic water supply, industrial process water supply, industrial service water supply, and agricultural water supply. Based on a geotechnical investigation performed at the project site, groundwater may be within 5 feet of the ground surface in lower-lying portions of the project, such as near US 101 and Wolfe Grade.[153] As discussed in section 4.8, *Hazards and Hazardous Materials*, there is no documented groundwater contamination beneath the project site; however, residual groundwater contamination, if present, could migrate beneath the project site from four adjacent leaking underground storage tank sites.

4.8.1.4 Flooding

Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for the project area, the project site is predominantly mapped within a 200-year flood hazard area. The project site is not located within a 100-year flood hazard area.[154]

4.8.1.5 Dam Inundation

The Marin Municipal Water District (MMWD) operates and maintains seven dams and associated reservoirs for municipal water supply, including the Phoenix Dam located hydraulically upgradient of the proposed project. The northwest portion of the project site in the Town of Ross could be subject to inundation in the event of a catastrophic failure of the Phoenix Dam.[155] The potential inundation area is located approximately 1.2 miles northeast of the Phoenix Dam. Phoenix Dam is an earthen dam that was built in 1905 to form Phoenix Lake, with a reservoir capacity of about 411 acre feet. Phoenix Dam is under the jurisdiction and control of the State Division of Safety of Dams (DSOD). All reservoirs with storage capacity exceeding 50 acre feet or with dam heights over 25 feet are permitted and inspected by the DSOD.

4.8.1.6 Seiches

A seiche is the oscillation of a body of water at its natural period. Seiches occur most frequently in enclosed or semi-enclosed basins such as lakes, bays, or harbors and may be triggered by strong winds, changes in atmospheric pressure, earthquakes, tsunami, or tides. Coastal measurements of sea level often show seiches with amplitudes of a few centimeters and periods of a few minutes due to oscillations of the local harbor, estuary, or bay, superimposed on the normal tidal changes. Triggering forces that set off a seiche are most effective if they operate at specific frequencies relative to the size of an enclosed basin. Due to the basin geometry and dimensions of the San Francisco Bay, seiches pose a negligible hazard to the San Francisco Bay Area.[156]

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153 Miller Pacific Engineering Group, 2017. *Geotechnical Investigation Report, Sir Francis Drake Boulevard, MMWD Pipeline Replacement Project, Larkspur and Kentfield, California*. June 16.

154 Federal Emergency Management Agency (FEMA), 2016. *Flood Insurance Rate Map, Marin County*. Maps 06041C0458F and 06041C0459F. March 16.

155 Marin County Community Development Agency, 2005. *Flooding Technical Background Report*. November.

156 Borrero, Jose, et al., 2006. *Numerical Modeling of Tsunami Effects at Marine Oil Terminals in San Francisco Bay*. Report for the Marine Facilities Division of the Californian State Lands Commission. June 8.

4.8.1.7 Tsunamis

Tsunamis are long-period water waves caused by underwater seismic events, volcanic eruptions, or undersea landslides. According to the California Emergency Management Agency, the proposed project is not mapped within a tsunami inundation area.[157]

4.8.1.8 Mudflow

Prolonged and intense rainfall on steep hillslopes can cause mud flows (also known as debris flows). These catastrophic flows are capable of destroying homes, washing out roads and bridges, sweeping away cars, knocking down trees, and obstructing streams and roadways with thick deposits of mud and rocks. While there are steep hillsides near portions of the project site, no evidence of mudflow deposits have been mapped adjacent to the proposed project.[158]

4.8.1.9 Sea-Level Rise

In 2012, the Coastal and Ocean Resources Working Group of the California Climate Action Team, including staff from many state agencies, developed the *State of California Sea-Level Rise Guidance Document* (SLR Guidance Document) in response to Governor Schwarzenegger's Executive Order S-13-08, which directed state agencies to plan for sea level rise and coastal impacts. In April 2017, the Working Group of the California Ocean Protection Council Science Advisory Team (OPC-SAT) developed the *Rising Seas in California; An Update on Sea-Level Rise Science*, which provides the scientific foundation for a pending update to the SLR Guidance Document. OPC-SAT reported the following likely ranges of sea level rise for the San Francisco Bay that have about a 2 in 3 chance of containing the correct value:

- 0.3 to 0.5 feet by 2030
- 0.6 to 1.1 feet by 2050
- 1.0 to 3.4 feet by 2100

Based on sea-level rise inundation areas mapped by the National Oceanic and Atmospheric Administration, the project site would not be inundated by 3.4 feet or less of sea-level rise.[159]

4.8.2 Regulatory Framework

Federal, state, and local laws, regulations, orders, programs, and plans relevant to hydrology and water resources that may be affected by the proposed project are presented below.

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[157] California Emergency Management Agency, 2009. *Tsunami Inundation Map for Emergency Planning, San Rafael Quadrangle, San Quentin Quadrangle*. July 1.

[158] Miller Pacific Engineering Group, 2017. *Op. cit.*

[159] National Oceanic and Atmospheric Administration, 2017. *Sea Level Rise Viewer*. Available: https://coast.noaa.gov/digitalcoast/tools/slr. Accessed on June 22.

4.8.2.1 Federal Regulations

The federal regulatory framework related to hydrology and water quality in the project area is described below.

Federal Clean Water Act (CWA) of 1972. The CWA and subsequent amendments establish the basic structure for the U.S. Environmental Protection Agency (USEPA) to regulate discharges of pollutants into the waters of the United States. Under the CWA, the USEPA sets water quality standards for contaminants in surface waters and implements the pollutant control programs, as discussed below.

Impaired Waters and TMDL Program. In accordance with Section 303(d) of the CWA, states must evaluate all available water quality-related data and information to present the USEPA with a list of water bodies that do not meet established water quality standards (i.e., impaired waters). States must then develop a TMDL for every pollutant on the impaired waters list. An essential component of a TMDL is the calculation of the maximum amount of a pollutant that a waterbody can receive while still meeting water quality standards. Based on the TMDL, the state allocates a loading capacity among the various point and non-point sources that discharge to the impaired waterbody. Permits for point sources are issued through the USEPA's NPDES program, as discussed below.

NPDES Permit Program. Under Section 402 of the CWA, the discharge of pollutants through a point source into waters of the United States is prohibited unless the discharge is in compliance with an NPDES permit. The NPDES program regulates the discharge of pollutants from municipal and industrial wastewater treatment plants and sewer collection systems, as well as stormwater discharges from industrial facilities, municipalities, and construction sites. In California, implementation and enforcement of the NPDES program is conducted through the State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards. The Regional Water Quality Control Boards set standard conditions for each permittee in their region, which includes effluent limitations and monitoring programs. The proposed project would be subject to NPDES permits as described under the State regulatory framework, below.

Federal Flood Insurance Program. In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer funded disaster relief for flood victims and the increasing amount of damage caused by floods. The NFIP makes federally backed flood insurance available for communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. FEMA manages the NFIP and creates Flood Insurance Rate Maps that designate 100-year floodplain zones and delineate other flood hazard areas. A FEMA 100-year flood hazard zone is an area that has a 1-in-100 (1 percent) chance of being flooded in any year based on historical data.

4.8.2.2 State Regulations

The state regulatory framework related to hydrology and water quality in the project area is described below.

Porter-Cologne Water Quality Control Act. The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides for the protection of the quality of all waters of the State of California for use and enjoyment by the people of California. The act also establishes provisions for a

statewide program for the control of water quality, recognizing that waters of the state are increasingly influenced by interbasin water development projects and other statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within the state. The statewide program for water quality control is therefore administered on a local level with statewide oversight. Within this framework, the act authorizes the State Water Board and the nine Regional Water Quality Control Boards to oversee the coordination and control of water quality within California. The Porter-Cologne Act also provides for the development and tri-annual review of Water Quality Control Plans (Basin Plans) that designate beneficial uses of California's major rivers and groundwater basins and establish narrative and numerical water quality objectives for these waters.

NPDES Construction General Permit. Construction in California that disturbs one or more acres of land surface are required to comply with the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (as amended by Order No. 2010-0014-DWQ and 2012-006-DWQ) (Construction General Permit). The Construction General Permit is issued by the State Water Board and is overseen by the Regional Water Board in the proposed project area.

To obtain coverage under the Construction General Permit, the discharger must provide via electronic submittal, a Notice of Intent, a Storm Water Pollution Prevention Plan (SWPPP), and other documents required in Attachment B of the Construction General Permit. The construction activities subject to this permit include clearing, grading, and disturbances to the ground such as stockpiling or excavation, but do not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The permit also covers linear underground and overhead projects such as pipeline installations.

The Construction General Permit uses a risk-based permitting approach and mandates certain requirements based on the established risk level (Risk Level 1, 2, or 3). The project risk level is based on the risk of sediment discharge and the receiving water risk. The sediment discharge risk depends on the project location and timing (i.e., wet season versus dry season activities). The receiving water risk depends on whether the project would discharge to a sediment-sensitive receiving water. The discharger would determine the project risk level when filing the Notice of Intent.

A Qualified SWPPP Developer must prepare a SWPPP that meets the certification requirements in the Construction General Permit. The purpose of the SWPPP is to (1) help identify the sources of sediment and other pollutants that could affect the quality of stormwater discharges; and (2) describe and ensure the implementation of Best Management Practices (BMPs) to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges resulting from construction activity. Common BMPs on construction sites include the placement of vegetation, straw, fiber, stabilizing emulsion, protective blankets, or other materials on areas of disturbed soils to reduce erosion. A Qualified SWPPP Practitioner must oversee the operation of BMPs that meet the requirements outlined in the permit.

The SWPPP also requires a construction site monitoring program. The monitoring program may include, depending on a particular project's risk level, visual observations of site discharges, water

quality monitoring of site discharges (pH, turbidity, and non-visible pollutants, if applicable), and receiving water monitoring (pH, turbidity, suspended sediment concentration, and bioassessment).

The Construction General Permit allows non-stormwater discharge of dewatering effluent if the water is not contaminated and is properly filtered or treated, using appropriate technologies such as clarifier tanks or sand filters. If the dewatering activity is deemed by the local Regional Water Board not to be covered by the Construction General Permit, then the discharger would be required to prepare a Report of Waste Discharge, and if approved by the local Regional Water Board, be issued site-specific waste discharge requirements (WDRs) under NPDES regulations. Site-specific WDRs contain rigorous monitoring requirements and performance standards that, when implemented, ensure that receiving water quality is not substantially degraded. The discharge of dewatering effluent is authorized under the Construction General Permit if the following conditions are met.

- The discharge does not cause or contribute to a violation of any water quality standard.
- The discharge does not violate any other provision of the Construction General Permit.
- The discharge is not prohibited by the applicable Basin Plan.
- The discharger has included and implemented specific BMPs required by the Construction General Permit to prevent or reduce the contact of the non-stormwater discharge with construction materials or equipment.
- The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants.
- The discharge is monitored and meets the applicable numeric action levels.
- The discharger reports the sampling information in the annual report.

If any of the above conditions are not satisfied, the discharge of dewatering effluent is not authorized by the Construction General Permit. The discharger must notify the local Regional Water Board of any anticipated non-stormwater discharges not already authorized by the Construction General Permit or another NPDES permit, to determine whether a separate NPDES permit is necessary.

NDPES Municipal Permit. Municipal stormwater discharges in Marin County are regulated under the statewide NPDES General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems, Order No. 2013-0001-DWQ (Small MS4 General Permit). The Marin County Stormwater Pollution Prevention Program (MCSTOPPP) has developed tools and guidance to help the cities, towns, and County of Marin to comply with the requirements of the Small MS4 General Permit.

Under the Small MS4 General Permit, regulated projects include roadways and linear underground projects (LUPs) that create 5,000 square feet or more of newly constructed contiguous impervious surface and that are public road projects and/or fall under the building and planning authority of a

Permittee. These regulated projects must comply with the post-construction stormwater management measures described in the Small MS4 General Permit, such as the Low Impact Development (LID) design standards. LID employs principles such as preserving and recreating natural landscape features and minimizing impervious surfaces to create functional and appealing site drainage that treats stormwater as a resource, rather than as a waste product. Common practices used to adhere to the LID principles may include, but are not limited to, the use of permeable pavement and bioretention swales. Specific projects that are excluded from the post-construction stormwater management measures include trenching, excavation, and resurfacing associated with LUPs; pavement grinding and resurfacing of existing roadways and parking lots; construction of new sidewalks, pedestrian ramps, or bike lanes on existing roadways; or routine replacement of damaged pavement such as pothole repair or replacement of short, non-contiguous sections of roadway. Since the proposed project includes resurfacing of SFDB, linear excavations for an underground water pipeline, and construction of new sidewalks, the proposed project would not be subject to the post-construction stormwater management measures of the Small MS4 General Permit.

4.8.2.3 Regional Water Quality Control Board

Basin Plan. The Regional Water Board implements the Basin Plan,[160] which is a master policy document for managing water quality issues in the San Francisco Bay region. The Basin Plan establishes beneficial water uses for waterways and water bodies within the region. The Regional Water Board also evaluates the water quality within water bodies to determine if they are impacted by pollutants such that it would impair its use. Impaired waters are rivers, lakes, or streams that do not meet one or more water quality standards and are considered too polluted for the intended beneficial uses. Specific narrative and numerical water quality objectives (e.g., color and concentration limits, respectively) have been developed in the Basin Plan to protect beneficial use designations through the adoption of WDRs, cleanup abatement orders, and TMDLs.

4.8.2.4 Marin County

Marin Countywide Plan. The Countywide Plan is a comprehensive long-range general plan for the unincorporated areas of Marin County, which includes the Kentfield/Greenbrae Community.[161] The following policies related to hydrology and water quality from the Marin Countywide Plan apply to the proposed project:

Goal WR-1: Healthy Watersheds. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water

<u>Policy WR-1.1: Protect Watersheds and Aquifer Recharge.</u> Give high priority to the protection of watersheds, aquifer-recharge areas, and natural drainage systems in any consideration of land use.

[160] Regional Water Board, 2017. *Op. cit.*
[161] Marin County, 2007. *Marin Countywide Plan.* November 6.

Policy WR-1.3: Improve Infiltration. Enhance water infiltration throughout watersheds to decrease accelerated runoff rates and enhance groundwater recharge. Whenever possible, maintain or increase a site's predevelopment infiltration to reduce downstream erosion and flooding.

Goal WR-2: Clean Water. Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses. (Policies on water availability are found in the Public Facilities and Services Section of the Built Environment Element.)

Policy WR-2.1: Reduce Toxic Runoff. Reduce the volume of urban runoff from pollutants — such as pesticides from homes, golf courses, cleaning agents, swimming pool chemicals, and road oil and of excess sediments and nutrients from agricultural operations.

Policy WR-2.3: Avoid Erosion and Sedimentation. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and on-site sediment retention. Require developments to include on-site facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.

Policy WR-2.4: Design County Facilities to Minimize Pollutant Input. Design, construct, and maintain County buildings, landscaped areas, roads, bridges, drainages, and other facilities to minimize the volume of toxics, nutrients, sediment, and other pollutants in stormwater flows, and continue to improve road maintenance methods to reduce erosion and sedimentation potential.

Goal EH-2: Safety from Seismic and Geologic Hazards. Protect people and property from risks associated with seismic activity and geologic conditions.

Policy EH-2.4: Protect Coastal Areas from Tsunamis. When inundation maps become available, address tsunami wave run-up and inundation when reviewing proposed development along coastal areas of Marin County.

4.8.2.5 City of Larkspur

City of Larkspur General Plan. Policies related to hydrology and water quality from the Larkspur's General Plan that would apply to the proposed project include:[162]

Goal 4: Protect Larkspur from the risk of flood damage.

> *Action Program [8]: Establish standards for minimum grades and minimum finished floor elevations that take into consideration the rising sea level during the expected life of the project.*

Policy i: Continue to upgrade the City's drainage system.

[162] City of Larkspur, 1990. *City of Larkspur, California, General Plan*.

4.8.3 Significance Criteria

Appendix G of the CEQA Guidelines provides that a project may have a significant impact related to hydrology and water quality if it would:

- Violate any water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Inundation by seiche, tsunami, mudflow, or sea-level rise.[163]

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to hydrology and water quality if it would:

- Locate facilities in a flood-prone areas.
- Increase off-site flood hazard, erosion, or sedimentation.
- Substantially degrade or deplete groundwater resources.
- Substantially interfere with groundwater recharge.
- Substantially degrade surface or groundwater quality.

[163] The Appendix G criterion from the CEQA Guidelines was modified to include inundation by sea-level rise.

4.8.4 Impacts and Mitigation Measures

The following discussion analyzes impacts related to hydrology and water quality that could result from project implementation. All impacts would be less than significant after mitigation.

(1) Water Quality Standards or Waste Discharge Requirements. The following discussion includes a description of construction period and operation period water quality effects, both of which are captured under this impact.

Impact HYD-1: Project construction activities could generate non-stormwater discharges of contaminated dewatering effluent (S).

Operation-Period Impacts. Project operations would not degrade water quality, because the project would not result in a net increase in stormwater runoff and would not introduce any new potential sources of stormwater pollution. Furthermore, the project would install bioretention areas and pervious pavement that would beneficially enhance the infiltration of stormwater to the subsurface. As a result, project operations would have a less-than-significant impact on water quality.

Construction-Period Impacts. Project construction would involve resurfacing, grading, and excavation activities, which could result in temporary erosion and movement of sediments into the storm drain system, particularly during precipitation events. The potential for chemical releases is also present at most construction sites due to the use of paints, solvents, fuels, lubricants, and other hazardous materials associated with heavy construction equipment. Once released, these hazardous materials could be transported to nearby surface waterways in stormwater runoff, wash water, and dust control water, potentially reducing the quality of the receiving waters. The release of sediments and other pollutants during construction could adversely affect water quality in receiving waters.

Because the proposed project would involve construction activities that would disturb over 1-acre of land, the project would be required to comply with the NPDES Construction General Permit. In accordance with the Construction General Permit, a Qualified SWPPP Developer must prepare a SWPPP that includes BMPs to prevent the degradation of stormwater quality, including operating procedures and practice to control site runoff, measures to reduce the risk of spills or leaks from reaching the receiving waters, and procedures to address minor spills of hazardous materials. For example, construction site operators must store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed). In addition, as required by the Construction General Permit, equipment and materials for cleanup of spills must be available on site and spills and leaks must be cleaned up immediately and disposed of properly. A Qualified SWPPP Practitioner must oversee the operation of BMPs that meet the requirements outlined in the Construction General Permit. Because compliance with the Construction General Permit is mandatory, stormwater discharges during project construction would have a less-than-significant impact on water quality.

The Construction General Permit allows non-stormwater discharge of dewatering effluent if the water is not contaminated and is properly filtered or treated, using appropriate technologies such as clarifier tanks or sand filters. As discussed in Section 4.8, *Hazards and Hazardous Materials*, dewatering activities for the proposed project could encounter residual groundwater

contamination, particularly during pipeline replacement activities, from four leaking underground storage tank sites located adjacent to the project site. Therefore, non-stormwater discharges of potentially contaminated dewatering effluent during project construction could have a potentially significant impact on the environment. Implementation of the following mitigation measure would reduce the impact related to non-stormwater discharges of potentially contaminated dewatering effluent to less than significant.

> Mitigation Measure HYD-1: Implement Mitigation Measure HAZ-1, which requires preparation and implementation of a Construction Risk Management Plan (CRMP). (LTS)

Significance After Implementation. Implementation of Mitigation Measure HAZ-1 would reduce the impact related to non-stormwater discharges of potentially contaminated dewatering effluent to less than significant by providing specific construction worker health and safety requirements, procedures for managing hazardous materials in accordance with applicable laws, regulations, and permit requirements, and contingency measures in case unknown contamination is encountered during construction.

(2) Groundwater Supplies and Recharge. The project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. Dewatering during the construction period would likely be required; however, dewatering would only result in a temporary effect on the local uppermost water-bearing zone related to near-surface excavations. The proposed project would not result in a net increase in the existing impervious surface area of SFDB; therefore, the project would not interfere with groundwater recharge. In addition, the proposed reconfiguration of the SFDB intersections at La Cuesta Drive and El Portal Drive would include new stormwater quality facilities, such as bioretention areas and pervious pavement that would beneficially enhance the infiltration of stormwater to the subsurface. Overall, the potential impact of the project on groundwater supplies and recharge would be less than significant.

(3) Erosion or Siltation. The proposed project would not substantially alter the existing drainage pattern of SFDB, nor would it alter the existing course of Corte Madera Creek. The project would also not increase the existing amount of stormwater runoff that could potentially cause erosion or siltation, because the project would not result in a net increase in the existing impervious surface area of SFDB. As discussed above, the project would implement stormwater quality facilities such as bioretention areas and pervious pavement that would enhance the infiltration of stormwater to the subsurface and thereby result in a beneficial decrease in the amount of stormwater runoff. Overall, the potential erosion or siltation impact of the project from changes in site drainage patterns would be less than significant.

(4) Flooding. As discussed above, the proposed project would not substantially alter the drainage pattern of SFDB, alter the course of Corte Madera Creek, nor increase the amount of stormwater runoff relative to existing conditions. Therefore, the project would not increase the potential for on- or off-site flooding. In addition, the project would install stormwater quality facilities such as bioretention areas and pervious pavement that would enhance the infiltration of stormwater to the subsurface and thereby result in a beneficial decrease in the amount of stormwater runoff. Overall, the potential flooding impact of the project from changes in site drainage patterns would be less than significant.

(5) Stormwater Runoff. As discussed above, the proposed project would not increase the amount of stormwater runoff relative to existing conditions; therefore, the proposed project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems. Since the project would not change the existing land use or result in a substantial increase in traffic, the project would not create a substantial increase in sources of polluted runoff. Overall, the potential project impact related to stormwater drainage systems and polluted runoff sources would be less than significant.

(6) Other Water Quality Concerns. The proposed project would have no additional potential impacts to water quality beyond those discussed above and under Impact HYD-1, below. Therefore, the potential project impact related to other water quality concerns would be less than significant.

(7) Housing within a 100-Year Flood Hazard Area. The proposed project does not include housing and is not mapped within a FEMA 100-year flood hazard area. Therefore, the proposed project would have no impact related to the placement of housing in a 100-year flood hazard area.

(8) Flows within a 100-Year Flood Hazard Area. The proposed project is not located within a FEMA 100-year flood hazard area. Therefore the proposed project would have no impact related to the placement of structures within a 100-year flood hazard area that could impede or redirect flood flows.

(9) Dam and Levee Failure. The proposed project is not mapped within an area susceptible to flooding due to a levee failure. However, the northwest portion of the project site in the Town of Ross could be subject to inundation in the event of a catastrophic failure of the Phoenix Dam. Inspection and maintenance of the Phoenix Dam is performed by the DSOD. The proposed project would not increase or exacerbate the risk of inundation by dam failure. Based on the rulings of the California Second District Court of Appeals (*Ballona Wetlands Land Trust v. City of Los Angeles*, 201 Cal. App. 4th 455) and the California Supreme Court (*California Building Industry Association vs. Bay Area Air Quality Management District*), an analysis of the effects of inundation associated with dam failure on the project site is not required if the project does not exacerbate the existing condition. Therefore, potential inundation by dam failure on the project would not be considered a significant CEQA impact. Overall, the project would have no impact on people or structures exposed to inundation from dam or levee failure.

(10) Seiche, Tsunami, Mud Flow, and Sea Level Rise. The proposed project is not located in an area that is susceptible to inundation from seiches, tsunamis, or sea-level rise. While there are steep hillsides near portions of the project site that could potentially be susceptible to mud flows, no evidence of mudflow deposits have been mapped adjacent to the proposed project. Furthermore, the project would not excavate into these hillsides or exacerbate the existing potential for a mud flow (if any). Therefore, the potential impact of the project on people, structures, or the environment exposed to inundation from seiches, tsunamis, mud flows, or sea-level rise would be less than significant.

4.9 LAND USE AND PLANNING POLICY

This section of the EIR discusses the proposed project's consistency with relevant public plans and policies. The analysis included in this section is the EIR preparer's best judgment (in consultation with County staff) of policy consistency. However, the EIR does not determine policy consistency. The formal policy consistency must be made by County decision-makers.

The consistency analysis is presented to assist decision-makers when they make their formal determinations of the proposed project's consistency with relevant policies. When the possibility of inconsistency is identified in the EIR, it is described as an "inconsistency" or "possible inconsistency" to focus attention to that policy issue.

It is not within the purview of an EIR to make final determinations of General Plan consistency, as such determinations are "quasi-legislative" in nature and require the County to evaluate whether, "considering all [the project's] aspects, it will further the objectives and policies of the general plan and not obstruct their attainment."

It is therefore the responsibility of Marin County's decision-makers to make the definitive decisions about policy consistency when the merits of the project are considered. The decision-makers have the sole authority to determine whether and how relevant policies apply to a specific project.

Inconsistency with policies are not environmental impacts, since determination of inconsistencies with General Plan or other plan policies are legal in nature and not an environmental impact (since a plan is not part of the physical environment).

4.9.1 Setting

The following section describes existing land use conditions within the project site and its vicinity.

Land Uses within the Project Site. The project site is a two-mile segment of SFDB located west of Highway 101 in the City of Larkspur to Ross Terrace in the Town of Ross. SFDB from Highway 101 to Ross has three distinct segments. The western segment near the Town of Ross has the lowest traffic volumes and generally includes the narrowest roadway cross-section, with three vehicle lanes and sidewalks, and is fronted by multifamily housing and the College of Marin. The middle segment, from College Avenue to El Portal Drive is four lanes with left turn pockets and sidewalks, and includes on-street parking west of Wolfe Grade. Small businesses, multifamily housing, and the College of Marin front this segment and it is also home to three schools, Bacich Elementary School, Kent Middle School, and Marin Catholic High School, and includes a very constrained section of right-of-way due to steep topography between Bon Air Road and El Portal Drive that includes retaining walls and no median. East of Wolfe Grade, the north side of the roadway is backed up to by single family residences. The east section, near the Bon Air Shopping Center, has the highest motor vehicle traffic volume, but sidewalks are not continuous.

The portion of SFDB within the project limits has a right-of-way varying from 100 feet in width between Wolfe Grade and College Avenue to only 60 feet near the westerly limit. In general, two travel lanes are provided in each direction with a left turn lane at intersections from the easterly

limit to College Avenue. West of College Avenue, one travel lane with a center left turn lane is provided in each direction.

Land Uses in the Vicinity of the Project Site. The project site is located in central Marin County between the Cities of San Rafael and Larkspur. Sir Francis Drake Boulevard links the neighborhoods of Ross, Greenbrae, and Kentfield. SFDB also is an alternate route to access West Marin, San Anselmo, Fairfax, and Highway 1 from Highway 101. The project alignment is located in an unincorporated area of Marin County.

Properties adjacent to the project site are predominantly single-family residential homes. Commercial uses are located on the south side between Eliseo Drive and El Portal Drive, at the Bon Air Road intersection, and between West McAllister Avenue and Ross Terrace. Multifamily housing exists near the intersection of College Avenue. As described above, key facilities located along the corridor include Bon Air Shopping Center, Bacich Elementary School, Kent Middle School, Marin Catholic High School, College of Marin and Marin General Hospital.

4.9.2 Regulatory Framework

The main guiding documents regulating land use within and around the project site are the Marin Countywide Plan[164], the Marin County Development Code[165], and the Marin County Unincorporated Area Bicycle and Pedestrian Master Plan[166]. The City of Larkspur General Plan,[167] the City of Larkspur Bicycle and Pedestrian Master Plan,[168] the DRAFT City of Larkspur Bicycle and Pedestrian Master Plan Update[169] and the Kentfield/Greenbrae Community Plan[170] are also relevant to the proposed project.

The consistency of the project with other non-land use related policies is addressed in the appropriate topical sections of the EIR (e.g., Air Quality). Applicable land use policies from each of the documents listed above are described below.

4.9.2.1 Marin County

Marin Countywide Plan. The Marin CWP is a comprehensive plan for the protection of environmental quality and natural resources, existing and future development, and use of land in the County. The Marin CWP is an expression of community values. The current CWP was adopted by the Board of Supervisors on November 6, 2007. The CWP serves as the comprehensive guide for

164 Marin County Community Development Agency, 2007. *Marin Countywide Plan*.
165 Marin County, 2008. Marin County Development Code.
166 Marin County, 2008. Marin County Unincorporated Area Bicycle and Pedestrian Master Plan. March.
167 City of Larkspur, 1990. *1990 Larkspur General Plan.* November http://www.ci.larkspur.ca.us/152/General-Plan .
168 City of Larkspur, 2004. *City of Larkspur Bicycle and Pedestrian Master Plan.* August. http://www.ci.larkspur.ca.us/557/Bicycle-Pedestrian-Safety
169 City of Larkspur, 2015.
170 Kentfield/Greenbrae Community Planning Group and Marin County Planning Department. 1987. *Kentfield/Greenbrae Community Plan.* May. http://www.marincounty.org/depts/cd/divisions/planning/plans-policies-and-regulations/community-and-area-plans

making decisions about land use, economic development, road improvements, and protection of natural resources and public health and safety. The CWP also provides the legal foundation for all zoning, subdivision, and public facilities decisions and projects.

The project site is located along SFDB between Highway 101 and the town limits of Ross within the Lower Ross Valley Planning Area. The Lower Ross Valley Planning Area lies within the City-Centered Corridor as designated by the CWP. The City-Centered Corridor is one of four environmental corridors established by the Marin CWP based on natural features and appropriate land uses. The City-Centered Corridor includes the land along Highway 101 in the eastern part of the county near San Francisco and San Pablo bays, which is designated for urban development and for protection of environmental resources. This corridor is divided into six planning areas that correspond with distinct watersheds.

The proposed project would be constructed along SFDB, which as a public roadway has no general plan designation. Land use designations within the unincorporated portions of the project area include Single Family Residential (SF5 [2-4 units/acre], SF6 [4-7 units/acre]), Multi-family Residential (MF2 [1-4 units/acre], MF3 [5-10 units/acre], MF4 [11-30 units/acre]), Public Facility (PF), Neighborhood Commercial (NC), and Office Commercial (OC) (Figure 4.9-1a and Figure 4.9-1b).

Table 4.9.A discusses the project's consistency, potential inconsistency, or inconsistency, with relevant policies of the 2007 Marin Countywide Plan. Applicable policies and programs related to Geology, Soils, and Seismicity, Hazardous Materials; Hydrology and Water Quality; Biological Resources; Transportation and Circulation; Air Quality; and Visual Quality are also discussed in those topical sections of the EIR.

To assess consistency, the discussion in Table 4.9.A uses the terms *consistent, potentially inconsistent*, and *inconsistent*. These terms are defined as follows:

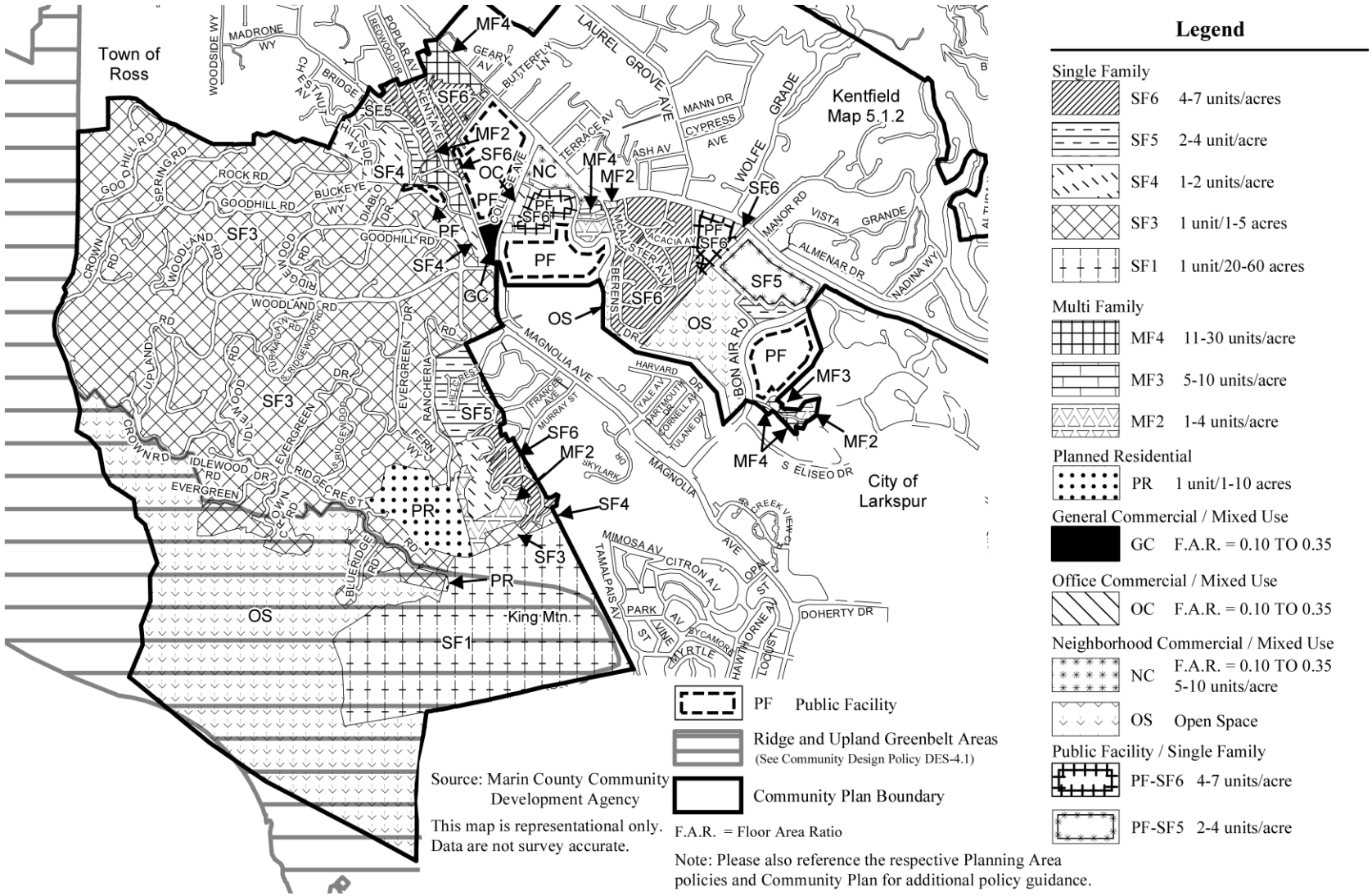
Consistent is used when the proposed project, taking into consideration mitigation measures, would comply with all the requirements of the relevant policy or regulation.

Potentially Inconsistent is used when it is unclear whether the entire project is in conflict with the policy or regulation.

Inconsistent is used when the entire project would or may conflict with any part of policy or regulation

Marin County Development Code and Marin County Zoning Ordinance. The broad purposes of the Marin Development Code are to protect and promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents and businesses in Marin County and to implement the policies of the Marin Countywide Plan. The Development Code is used in conjunction with the Zoning Ordinance to classify and regulate the uses of land and structures within the unincorporated areas of Marin County.

As described above, the project area is the existing roadway right-of-way; therefore, the project area itself has no zoning designation in the Marin County Zoning Ordinance. Adjacent land uses



LSA

FIGURE 4.9-1a

FIGURE NOT TO SCALE

SOURCE: Marin Countywide Plan 2007

Sir Francis Drake Boulevard Rehabilitation Project

Marin Countywide Plan Land Use Designations

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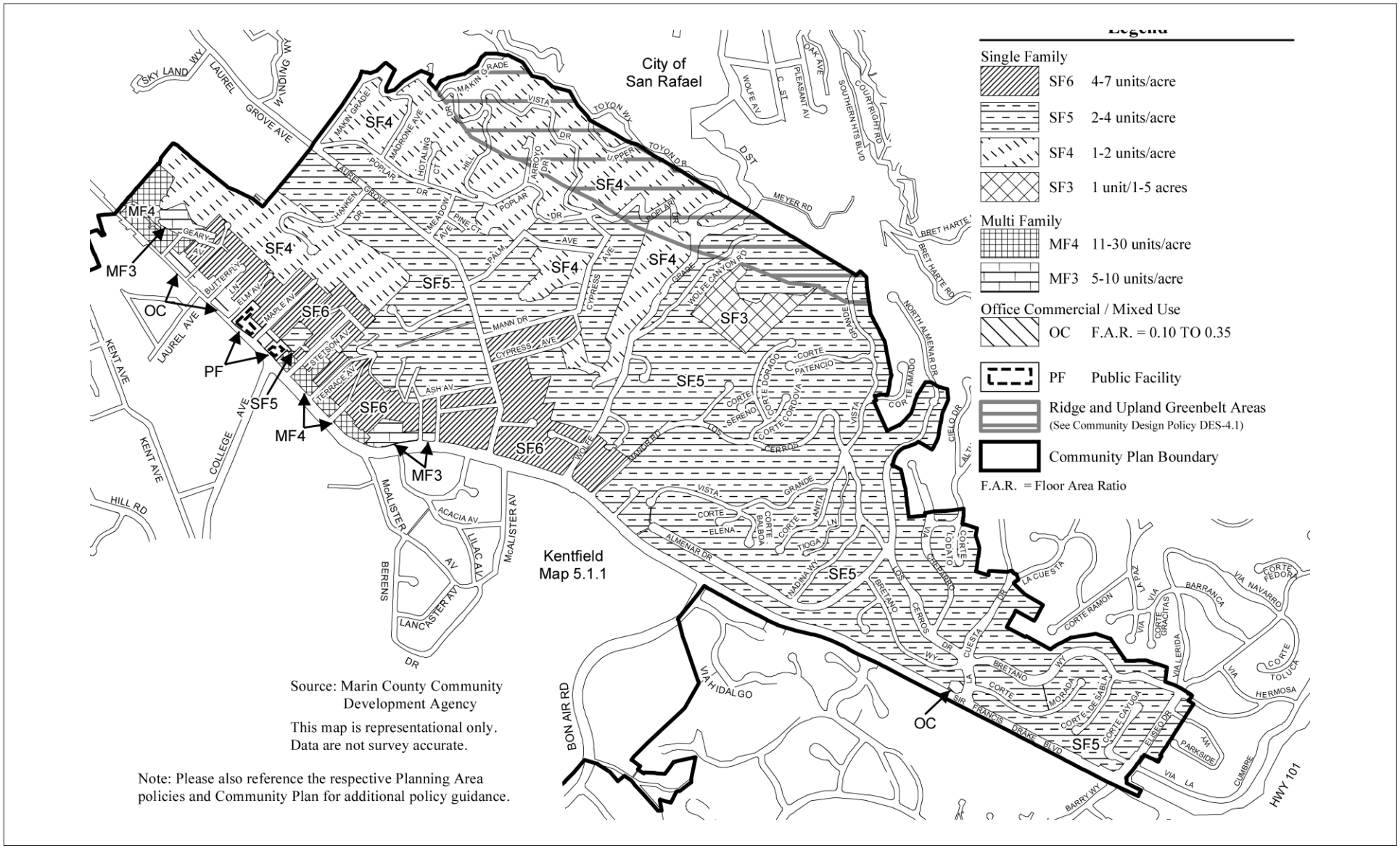

LSA

FIGURE 4.9-1b

FIGURE NOT TO SCALE

SOURCE: Marin Countywide Plan 2007

Sir Francis Drake Boulevard Rehabilitation Project

Marin Countywide Plan Land Use Designations

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along the alignment are designated Residential Single-Family (R1-B2, R1-B1, R1), Residential Single-Family Planned (PF-RSP-4.36), Residential Multiple Planned (RMP-6, RMP-10, RMP-20, RMP-30), Residential Commercial Multiple Planned (RMPC), Planned Commercial (CP), Planned Office (OP), and Public Facilities (PF). Allowable uses within these zoning designations include:

- *Residential Single-Family (R1)* is intended for areas suitable for single-family residential neighborhood development in a suburban setting, along with similar and related compatible uses. Permitted uses include: affordable housing, group homes, guest house, home occupations, residential accessory uses, residential care facilities, second units, single-family dwellings, day-care facilities, public parks and playgrounds, and tennis and other recreational uses. Pipelines, utility lines and telecommunication facilities are considered a conditional use in this district and a Use Permit is required.

- *Residential Single-Family Planned (RSP)* is similar to Residential Single-Family; however, site or neighborhood characteristics require the attention to detail provided through the Master Plan process. Permitted uses are similar to those described above for the R1 district where authorized by a Master Plan.

- *Residential Multiple Planned (RMP)* is intended for a full range of residential development types within the unincorporated urban areas of the County, including single-family, two-family dwellings, multi-family residential development, and limited commercial uses in suburban settings, where site or neighborhood characteristics require particular attention to design detail provided through the Master Plan process. Where authorized by a Master Plan, permitted uses include: affordable housing, group homes (6 or fewer residents), guest house, home occupations, multi-family dwellings, residential care facilities, second units, single-family dwellings, two-family dwellings, day-care facilities, public parks and playgrounds, and tennis and other recreational uses. Pipelines, utility lines and telecommunication facilities are considered a conditional use in this district and a Use Permit is required.

- *Residential/Commercial Multiple Planned (RMPC)* is generally similar to RMP, but also allows selected commercial uses. The RMPC district is applied to areas identified by the Marin Countywide Plan as capable of accommodating increased density. Permitted uses are similar to those described above for the RMP District, but also include various retail uses with a Use Permit.

- *Planned Commercial (CP)* provides for lower-intensity commercial areas for retail shopping, office facilities, and residential uses, through the control of building coverage, height, parking and landscaping. Where authorized by a Master Plan, permitted uses include various retail trade and service uses (e.g., restaurants, retail stores, shopping centers, grocery stores, hotels/motels, offices, service stations, banks), as well as, manufacturing and processing uses (e.g., beverage production, printing and publishing, food products, recycling facilities, laundries).

- *Administrative and Professional (AP)* provides for lower-intensity commercial areas emphasizing offices, and similar and related compatible uses, including residential uses. Permitted uses include: day-care centers, libraries and museums, banks, single-family dwellings, home

occupations, two-family dwellings, business support services, medical services, offices, and research and development.

- *Planned Office (OP)* provides for lower-intensity commercial areas for administrative, professional office and residential uses, in pleasing and harmonious surroundings, through the control of building coverage, height, parking and landscaping. Permitted uses are similar to those described above for the AP District where authorized by a Master Plan.

- *Public Facilities (PF)* is applied to land suitable for public facilities and public institutional uses, where a governmental, educational, or other institutional facility is the primary use of the site.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Biological Resources		
Goal BIO-1	**Enhanced Native Habitat and Biodiversity.** Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.	**Consistent.** As documented in Chapter 4.3 of the Draft EIR, background research and reports have been completed to identify sensitive biological resources onsite, including wetlands, special-status species and native trees. Qualified biologists have conducted analyses in order to determine the potential for project impacts on these resources and to identify appropriate mitigation measures to minimize the potential for significant impacts.
Policy BIO-1.1	**Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife Nursery Areas and Movement Corridors.** Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local and resource agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.	**Consistent.** Section 4.3 of this EIR describes the biological resources of the project site, evaluates the proposed project's potential impacts on those resources, and identifies appropriate mitigation measures to minimize those impacts. The proposed project has been designed to minimize potential environmental impacts. However, as described in Section 4.3, the project has the potential to adversely affect special-status animal species, native trees, and jurisdictional features (i.e., seasonal wetlands, streams). Implementation of mitigation measures identified in this EIR would reduce impacts to less-than-significant levels. Therefore, the proposed project would be consistent with County policies to protect wetlands, habitat for special-status species, and other sensitive biological resources.
Policy BIO-1.3	**Protect Woodlands, Forests, and Tree Resources.** Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas. See also Policy SV-1.7.	**Consistent.** As stated in Section 4.3, implementation of the proposed project would result in the removal of trees considered "protected" or "heritage" trees by Marin County and the City of Larkspur. In accordance with the Marin County Code and the Native Tree Preservation and Protection Ordinance, Mitigation Measure BIO-7 requires that trees be replaced and tree be protected during project construction. *With implementation of this mitigation measure, the proposed project would be consistent with Policy BIO-1.3*.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Goal BIO-2	**Protection of Sensitive Biological Resources.** Require identification of sensitive biological resources and commitment to adequate protection and mitigation, and monitor development trends and resource preservation efforts.	**Consistent.** As part of the project's environmental review process, a Biological Assessment was prepared by LSA (2015) to determine the nature and extent of the resources on the site, how the proposed project would affect sensitive biological resources, and what coordination would likely be required with responsible resource agencies. The analysis identified potential impacts that the project could have on special-status plant and wildlife species, native trees, and jurisdictional features (i.e., wetlands, streams). Mitigation measures identified in Section 4.3, Biological Resources, would reduce potential impacts on relevant resources to a less-than-significant level. As a result, the project would be consistent with the County's efforts to address resource preservation through the environmental review process.
Policy BIO-2.1	**Include Resource Preservation in Environmental Review.** Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving "no net loss" of sensitive habitat acreage, values, and function.	**Consistent.** See above.
Policy BIO-2.2	**Limit Development Impacts.** Restrict or modify proposed development in areas that contain essential habitat for special-status species, sensitive natural communities, wetlands, baylands and coastal habitat, and riparian habitats, as necessary to ensure the continued health and survival of these species and sensitive areas. Development projects should preferably be modified to avoid impacts on sensitive resources, or to adequately mitigate impacts by providing on-site or (as a lowest priority) off-site replacement at a higher ratio.	**Consistent.** The project has been designed to minimize potential impacts on sensitive biological resources, including wetlands and special-status species. However, as described in Section 4.3, Biological Resources, construction of the proposed project could affect special-status animal species, native trees, and seasonal wetlands. Mitigation measures identified in Section 4.3 would reduce potential impacts on these resources to a less-than-significant level. Based on the combination of mitigation measures established to reduce potential impacts to sensitive biological resources, the project is consistent with the County's efforts to limit adverse impacts from development.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Policy BIO 2.3	**Preserve Ecotones.** Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the margins of riparian corridors, baylands and marshlands, vernal pools, and woodlands and forests where they transition to grasslands and other habitat types.	**Consistent.** As described in Section 4.3, implementation of the proposed project would impact riparian habitat along Wolfe Grade Creek as a result of construction activities associated with roadway improvements. Mitigation measures identified in Section 4.3 would reduce potential impacts on riparian areas to a less-than-significant level. Further, implementation of the drainage improvements included as part of the proposed project would prevent slope and road failure, which currently contribute sediment and roadway aggregate to surface waters.
Policy BIO-2.4	**Protect Wildlife Nursery Areas and Movement Corridors.** Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits, including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.	**Consistent.** Due to its highly urban character, use of the project site for wildlife movement is limited and as described in Section 4.3, implementation of the proposed project would not impact the use of the site as a wildlife movement corridor. Any animals that currently move through the site will continue to do so after the project is completed since most of the species that likely occur in the area are generalists that are adept at moving through urban landscapes. Upon completion, Sir Francis Drake Boulevard will be similar in size and scale to the existing roadway. Therefore, it is anticipated that wildlife would continue to use the project site as a wildlife movement corridor after rehabilitation of the roadway is complete.
Policy BIO-2.5	**Restrict Disturbance in Sensitive Habitat During Nesting Season.** Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional where development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.	**Consistent.** As described in Section 4.3, nesting birds could be affected by the project. The removal of trees and other site preparation activities could destroy active nests, harm individual birds, or cause nest abandonment. Mitigation Measure BIO-1 would reduce this potentially significant impact to a less-than-significant level. With the implementation of these mitigation measures, the project would be consistent with County policy to minimize disturbance to sensitive habitat during the nesting season.
Policy BIO-2.6	**Identify Opportunities for Safe Wildlife Movement.** Ensure that existing stream channels and riparian corridors continue to provide for wildlife movement at roadway crossings, preferably through the use of bridges, or through over-sized culverts, while maintaining or restoring a natural channel bottom. Consider the need for wildlife movement in	**Consistent.** See response to Policy BIO-2.4 above.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
	designing and expanding major roadways and other barriers in the county. Of particular concern is the possible widening of Highway 101 north of Novato to the county line, where maintenance of movement opportunities for terrestrial wildlife between the undeveloped habitat on Mount Burdell and the marshlands along the Petaluma River is critical.	
Policy BIO-2.8	**Coordinate with Trustee Agencies.** Consult with trustee agencies (the California Department of Fish and Game, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, U.S. Army Corps of Engineers, Environmental Protection Agency, Regional Water Quality Control Board, and Bay Conservation and Development Commission) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected.	**Consistent.** Prior to preparation of the EIR all trustee agencies received a Notice of Preparation and were asked to submit comments on environmental concerns. As part of the CEQA review process and as required by Mitigation Measure BIO-6a identified in Section 4.3, the appropriate permits and approvals would be obtained from responsible agencies, including the California Department of Fish and Game, U.S. Army Corps of Engineers, and the Regional Water Quality Control Board.
Policy BIO-2.9	**Promote Early Consultation with Other Agencies.** Require applicants to consult with all agencies with review authority for projects in areas supporting wetlands and special-status species at the outset of project planning.	**Consistent.** As described above, prior to preparation of the EIR, all trustee agencies were given the opportunity to comment on potential environmental concerns related to the proposed project. These agencies will again have an opportunity to comment on this EIR during the public review period.
Program BIO-2.a	**Require Site Assessments.** Require site assessment by a qualified professional for development applications that may adversely affect sensitive biological or wetland resources, including jurisdictional wetlands, occurrences of special-status species, occurrences of sensitive natural communities, and important wildlife nursery areas and movement corridors. The assessment should determine the presence or absence of any sensitive resources that could be affected by development, evaluate the potential impacts, and identify measures for protecting the resource and surrounding habitat. Require the assessment to be conducted by a qualified professional paid for by the applicant. Unless waived, the qualified professional should be hired directly by Marin County.	**Consistent.** As described in Section 4.3, a Biological Assessment for the proposed project was prepared by LSA in March 2015. As part of preparing the Biological Assessment, LSA conducted a literature review and field surveys to identify special-status plant and wildlife species and sensitive habitats in the project area. The Biological Assessment also identifies potential impacts associated with implementation of the proposed project, as well as mitigation measures required to reduce these impacts to less-than-significant levels. Based on the preparation of the Biological Assessment by a qualified professional, the project is consistent with the County's efforts to require site assessments.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Program BIO-2.c	**Facilitate Agency Review.** Coordinate County review with that of agencies with jurisdiction over proposed activities and areas, and require evidence of compliance with any necessary permits from federal and State agencies prior to issuance of County grading or building permits.	**Consistent.** As described above, prior to preparation of the EIR, all agencies with jurisdiction over proposed activities and areas were given the opportunity to comment on potential environmental concerns related to the proposed project. These agencies will again have an opportunity to comment on this EIR during the public review period. As part of the CEQA review process and as required by Mitigation Measure BIO-6a identified in Section 4.3, the appropriate permits and approvals would be obtained from responsible agencies. Evidence of compliance with any necessary permits will be required as specified in the Mitigation Monitoring and Reporting Program, which will be adopted as part of this EIR.
Goal BIO-3	**Wetland Conservation.** Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.	**Consistent.** As described in Section 4.3, Biological Resources, the proposed project would result in direct, permanent impact to approximately 45 square feet (0.001 acre) of a potentially jurisdictional roadside seasonal wetland ditch that would be filled and replaced with a concrete ditch or underground pipe as a result of road widening. Mitigation Measure BIO-6 requires that DPW obtain regulatory permits and compensate for the loss of 0.001 acre of wetland by establishing new seasonal wetland ditch at a minimum 1:1 on-site replacement ratio within the vicinity of the SFDB project, applying a native wetland seed mix to a new or existing ditch, or enhancing a creek channel in the vicinity of the project. With implementation of this mitigation measure, the project is consistent with the County's efforts to conserve wetlands.
Policy BIO-3.1	**Protect Wetlands.** Require development to avoid wetland areas so that the existing wetlands and upland buffers are preserved and opportunities for enhancement are retained (areas within setbacks may contain significant resource values similar to those within wetlands and also provide a transitional protection zone). Establish a Wetland Conservation Area (WCA) for jurisdictional wetlands to be retained, which includes the protected wetland and associated buffer area. Development shall be set back a minimum distance to protect the wetland and provide an upland buffer. Larger setback standards may apply to wetlands supporting special-status species or associated with riparian systems and baylands under tidal influence, given the importance of protecting the larger ecosystems for these habitat types as called for under Stream Conservation and Baylands Conservation	**Consistent.** As described in Section 4.3, Biological Resources, the proposed project would result in direct, permanent impact to approximately 45 square feet (0.001 acre) of a potentially jurisdictional roadside seasonal wetland ditch that would be filled and replaced with a concrete ditch or underground pipe as a result of road widening. Mitigation Measure BIO-6 requires that DPW obtain regulatory permits and compensate for the loss of 0.001 acre of wetland by establishing new seasonal wetland ditch at a minimum 1:1 on-site replacement ratio within the vicinity of the SFDB project, applying a native wetland seed mix to a new or existing ditch, or enhancing a creek channel in the vicinity of the project. With implementation of this mitigation measure, the project is consistent with the County's efforts to conserve wetlands. The proposed project is the rehabilitation of an existing roadway that is an integral

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	policies defined in Policy BIO-4.1 and BIO-5.1, respectively. Regardless of parcel size, a site assessment is required either where incursion into a WCA is proposed or where full compliance with all WCA criteria would not be met. Employ the following criteria when evaluating development projects that may impact wetland areas: City-Centered Corridor: - For parcels more than 2 acres in size, a minimum 100-foot development setback from wetlands is required. - For parcels between 2 and 0.5 acres in size, a minimum 50-foot development setback from wetlands is required. Minimum setback distance of 100 feet from jurisdictional wetlands for parcels more than 2 acres. - Minimum setback distance of 50 feet from jurisdictional wetlands for parcels between 2 and 0.5 acres. - Minimum setback distance of 20 feet for parcels less than 0.5 acres in size. - An additional setback distance may be required, based on the results of a site assessment, if such an assessment is determined to be necessary. Site assessments will be required and conducted pursuant to program BIO-3.c, Require Site Assessment. - Regardless of parcel size, a site assessment is required either where incursion into a WCA is proposed or where full compliance with all WCA criteria would not be met.	part of the County's overall roadway network. Given that the proposed project is the rehabilitation of an existing roadway with minimum pavement expansion, the proposed project would be exempt from WCA setback and buffer standards and is therefore consistent with the provisions of the WCA.
Policy BIO-3.2	**Require Thorough Mitigation.** Where avoidance of wetlands is not possible, require provision of replacement habitat on-site through restoration and/or habitat creation at a minimum ratio of 2 acres for each acre lost (2:1 replacement ratio) for on-site mitigation and a minimum 3:1 replacement ratio for off-site mitigation. Mitigation wetlands should be of the same type as those lost and provide habitat for the species that use the existing wetland. Mitigation should also be required for incursion within the minimum WCA setback/transition zone.	**Consistent.** Mitigation Measure BIO-6 requires that DPW obtain regulatory permits and compensate for the loss of 0.001 acre of wetland by establishing new seasonal wetland ditch at a minimum 1:1 on-site replacement ratio within the vicinity of the SFDB project, applying a native wetland seed mix to a new or existing ditch, or enhancing a creek channel in the vicinity of the project. With implementation of this mitigation measure, the project would be consistent with the County's policy to mitigate for loss of wetlands.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Program BIO-3.b	**Comply with Regulations to Protect Wetlands.** Continue to require development applications to include the submittal of a wetland delineation for sites with jurisdictional wetlands and to demonstrate compliance with these wetlands policies, standards, and criteria, and with State and federal regulations.	**Consistent.** Mitigation Measure BIO-6 requires compliance with County, State, and federal regulations including compensation for loss of wetlands and protection of wetlands within the project area. With implementation of this mitigation measure, the project would be consistent with the County's policy to comply with wetland regulations.
Program BIO-3.c	**Require Site Assessment.** Require development applications to include the submittal of a site assessment prepared by a qualified professional where incursions into the WCA are proposed, or adverse impacts to wetlands resources may otherwise occur. The assessment should be considered in determining whether any adverse direct or indirect impacts on wetlands would occur as a result of the proposed development, whether wetlands criteria and standards are being met, and to identify measures necessary to mitigate any significant impacts. The site assessment may also serve as a basis for the County to apply restrictions in addition to those required by State and federal regulations. The site assessment shall be paid for by the applicant. Unless waived, the qualified professional shall be hired directly by Marin County.	**Consistent.** As described in Section 4.3, a Biological Assessment for the proposed project was prepared by LSA in March 2015. As part of preparing the Biological Assessment, LSA conducted a literature review and field surveys to identify special-status plant and wildlife species and sensitive habitats in the project area. The Biological Assessment also identifies potential impacts associated with implementation of the proposed project, as well as mitigation measures required to reduce these impacts to less-than-significant levels. Based on the preparation of the Biological Assessment by a qualified professional, the project is consistent with the County's efforts to require site assessments.
Goal BIO-4	**Riparian Conservation.** Protect and, where possible, restore the natural structure and function of riparian systems.	**Consistent.** Section 4.3, Biological Resources, describes the extent of riparian habitat within the project area, potential impacts to riparian systems as a result of the proposed project, and appropriate mitigation measures to minimize significant impacts. Accordingly, the proposed project is consistent with the County's riparian conservation policy.
Policy BIO-4.1	**Restrict Land Use in Stream Conservation Areas.** A Stream Conservation Area (SCA) is established to protect the active channel, water quality and flood control functions, and associated fish and wildlife habitat values along streams. Development shall be set back to protect the stream and provide an upland buffer, which is important to protect significant resources that may be present and provides a transitional protection zone. Best management practices shall be adhered to in all designated SCAs. Best management practices are also strongly encouraged in ephemeral streams not defined as SCAs.	**Consistent.** This stretch of SFDB crosses both Wolfe Grade Creek and McAllister Creek and, therefore, crosses within a Stream Conservation Area (SCA) as defined in Figure 2-2 of the Countywide Plan. The project as proposed and with the implementation of recommended mitigation measures will utilize Best Management Practices to protect these creeks and their environs. Project components include repaving the existing roadway to improve pavement conditions that contribute to the deposition of contaminants into the creek areas. Mitigation measures are included in this EIR to protect and preserve aquatic resources in the project area. The SCA benefits associated with the proposed rehabilitation of an existing deteriorated roadway, combined with implementation

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	Exceptions to full compliance with all SCA criteria and standards may be allowed only if the following is true: 1) A parcel falls entirely within the SCA; or 2) Development on the parcel entirely outside the SCA either is infeasible or would have greater impacts on water quality, wildlife habitat, other sensitive biological resources, or other environmental constraints than development within the SCA. SCAs are designated along perennial, intermittent, and ephemeral streams as defined in the Countywide Plan Glossary. Regardless of parcel size, a site assessment is required where incursion into an SCA is proposed or where full compliance with all SCA criteria would not be met. An ephemeral stream is subject to the SCA policies if it: (a) supports riparian vegetation for a length of 100 feet or more, and/or (b) supports special-status species and/or a sensitive natural community type, such as native grasslands, regardless of the extent of riparian vegetation associated with the stream. For those ephemeral streams that do not meet these criteria, a minimum 20-foot development setback should be required. SCAs consist of the watercourse itself between the tops of the banks and a strip of land extending laterally outward from the top of both banks to the widths defined below (see Figure 2-2). The SCA encompasses any jurisdictional wetland or unvegetated other waters within the stream channel, together with the adjacent uplands, and supersedes setback standards defined for WCAs. Human-made flood control channels under tidal influence are subject to the Bayland Conservation policies. The following criteria shall be used to evaluate proposed development projects that may impact riparian areas: City-Centered Corridor: - For parcels more than 2 acres in size, provide a minimum 100-foot development setback on each side of the top of bank. - For parcels between 2 and 0.5 acres in size, provide a minimum 50-foot development setback on each side of the top of bank. - For parcels less than 0.5 acres in size, provide a minimum 20-foot development setback. The developed portion(s) of parcels (less than	of EIR recommended biological mitigation measures are consistent with the provisions of the County's SCA policies.

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	0.5 acres in size) located behind an existing authorized flood control levee or dike are not subject to a development setback. - Regardless of parcel size, an additional buffer may be required based on the results of a site assessment. A site assessment may be required to confirm the avoidance of woody riparian vegetation and to consider site constraints, presence of other sensitive biological resources, options for alternative mitigation, and determination of the precise setback. Site assessments will be required and conducted pursuant to Program BIO-4.g, Require Site Assessment.	
Policy BIO-4.2	**Comply with SCA Regulations.** Implement established setback criteria for protection of SCAs through established discretionary permit review processes and/or through adoption of new ordinances. Environmental review shall be required where incursion into an SCA is proposed and a discretionary permit is required. In determining whether allowable uses are compatible with SCA regulations, development applications shall not be permitted if the project does any of the following: Adversely alters hydraulic capacity; Causes a net loss in habitat acreage, value, or function; Degrades water quality.	**Consistent.** As described in Sections 4.3 and 4.6, the proposed project could adversely affect the habitat and population of special-status species and degrade water quality during the construction period. Mitigation measures identified in this EIR would reduce these impacts to a less-than-significant level. Further, the proposed project would improve roadway surface conditions so that road runoff does not contribute to water quality degradation. The SCA benefits associated with the proposed rehabilitation of an existing deteriorated roadway, combined with implementation of EIR recommended biological and water quality mitigation measures are consistent with the provisions of the County's SCA regulations.
Policy BIO-4.4	**Promote Natural Stream Channel Function.** Retain and, where possible, restore the hydraulic capacity and natural functions of stream channels in SCAs. Discourage alteration of the bed or banks of the stream, including filling, grading, excavating, and installation of storm drains and culverts. When feasible, replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat, including through retention of large woody debris, except in cases where removal is essential to protect against property damage or prevent safety hazards. In no case shall alterations that create barriers to fish migration be allowed on streams mapped as historically supporting salmonids. Alteration of natural channels within SCAs for flood control should be designed and constructed in a manner that retains and protects the riparian vegetation, allows for sufficient capacity and natural channel migration,	**Consistent.** The proposed project would improve road conditions so that road runoff does not contribute to water quality degradation. Mitigation measures included in this EIR also require the County to restore disturbed areas, protect sensitive biological resources, and implement Best Management Practices to reduce stormwater runoff and protect water quality. With implementation of these mitigation measures, the project would be consistent with County policies to promote natural stream channel function.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
	and allows for reestablishment of woody trees and shrubs without compromising the flood flow capacity where avoidance of existing riparian vegetation is not possible.	
Policy BIO-4.7	**Protect Riparian Vegetation.** Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.	**Consistent.** The project may impact up to 2,000 square feet of riparian vegetation associated with Wolfe Grade Creek at the intersection of SFDB and McAllister Avenue. Mitigation Measure BIO-5 requires installation of protective fencing to prevent impacts to riparian vegetation and compensation for any impacted riparian areas at a ratio of 3:1. Therefore, the project with the implementation of recommended mitigation would be consistent with County's riparian vegetation protection policies.
Policy BIO-4.14	**Reduce Road Impacts in SCAs.** Locate new roads and roadfill slopes outside SCAs, except at stream crossings, and consolidate new road crossings wherever possible to minimize disturbance in the SCA. Require spoil from road construction to be deposited outside the SCA, and take special care to stabilize soil surfaces.	**Consistent.** The proposed project would rehabilitate an existing roadway and improve road conditions. It would not create a new road or road crossings. The beneficial effects to the existing condition in the SCA from the proposed project are consistent with County policies to limit roadway impacts in the SCA.
Policy BIO-4.15	**Reduce Wet Weather Impacts.** Ensure that development work adjacent to and potentially affecting SCAs is not done during the wet weather or when water is flowing through streams, except for emergency repairs, and that disturbed soils are stabilized and replanted, and areas where woody vegetation has been removed are replanted with suitable species before the beginning of the rainy season.	**Consistent.** In accordance with Mitigation Measure BIO-2, project construction shall be scheduled to minimize ground disturbance during the rainy season. The project applicant shall: (1) Sequence construction activities to minimize the amount of time that soils remain disturbed; (2) Stabilize all disturbed soils as soon as possible following the completion of ground disturbing work; and (3) Install erosion and sediment control BMPs prior to the start of any ground-disturbing activities. With implementation of this mitigation measure, the project would be consistent with County efforts to reduce wet weather impacts.
Policy BIO-4.16	**Regulate Channel and Flow Alteration.** Allow alteration of stream channels or reduction in flow volumes only after completion of environmental review, commitment to appropriate mitigation measures, and issuance of appropriate permits by jurisdictional agencies based on determination of adequate flows necessary to protect fish habitats, water quality, riparian vegetation, natural dynamics of stream functions, groundwater recharge areas, and downstream users.	**Consistent.** The proposed project would rehabilitate an existing roadway. It would not alter stream channels or reduce flow volumes in stream channels adjacent to the project alignment. In accordance with Mitigation Measure BIO-2, DPW shall: (1) Sequence construction activities to minimize the amount of time that soils remain disturbed; (2) Stabilize all disturbed soils as soon as possible following the completion of ground disturbing work; and (3) Install erosion and sediment control BMPs prior to the start of any ground-disturbing activities. With implementation of this mitigation measure, the project would be consistent with County efforts to regulate channel and flow alteration.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Policy BIO-4.20	**Minimize Runoff.** In order to decrease stormwater runoff, the feasibility of developing a peak stormwater management program shall be evaluated to provide mitigation opportunities such as removal of impervious surface or increased stormwater detention in the watershed.	**Consistent.** In accordance with Mitigation Measure BIO-2, the County shall prepare a SWPPP designed to reduce potential impacts to surface water quality through the project construction period. The SWPPP shall include, as applicable, Best Management Practices (BMPs) to minimize stormwater runoff as required in the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. With implementation of this measure, the project would be consistent with County efforts to minimize runoff.
Program BIO-4.f	**Identify Potential Impacts to Riparian Systems.** At the time of a development application, evaluate potential impacts on riparian vegetation and aquatic habitat, and incorporate measures to protect riparian systems into the project design and construction. Retain and minimize disturbance to woody and herbaceous riparian vegetation in SCAs and adjacent areas. (Tree growth may be cleared from the stream channel where removal is essential to protect against property damage or prevent safety hazards.)	**Consistent.** Section 4.3, Biological Resources, and Section 4.6, Hydrology and Water Quality of this EIR identify the potential impacts to riparian vegetation and aquatic habitat that could result from implementing the proposed project and outline appropriate mitigation measures to reduce those impacts to a less-than-significant level. With implementation of the mitigation measures identified in this EIR, the project would be consistent with County efforts to identify potential impacts to riparian systems.
Program BIO-4.g	**Require Site Assessment.** Require development applications to include the submittal of a site assessment prepared by a qualified professional where incursions into the SCA are proposed, or adverse impacts to riparian resources may otherwise occur. Unless waived, the qualified professional shall be hired by Marin County. The site assessment shall be paid for by the applicant and considered in determining whether any adverse direct or indirect impacts on riparian resources would occur as a result of the proposed development, whether SCA criteria and standards are being met, and to identify measures necessary to mitigate any significant impacts. The site assessment may also serve as a basis for the County to apply restrictions in addition to those required by State and federal regulations.	**Consistent.** As described in Section 4.3, a Biological Assessment for the proposed project was prepared by LSA in March 2015. As part of preparing the Biological Assessment, LSA conducted a literature review and field surveys to identify special-status plant and wildlife species and sensitive habitats in the project area. The Biological Assessment also identifies potential impacts associated with implementation of the proposed project, as well as mitigation measures required to reduce these impacts to less-than-significant levels. Based on the preparation of the Biological Assessment by a qualified professional, the project is consistent with the County's efforts to require site assessments.
Program BIO-4h	**Comply with SCA Criteria and Standards.** All development permit applications shall be reviewed for conformity with these SCA policies, criteria, and standards and in accordance with the California Environmental Quality Act. Proposals that do not conform to SCA policies, and cannot be modified or mitigated to conform, shall be denied. If a proposal involves the creation of a new parcel that is wholly	**Consistent**. As described in the preceding sections, the proposed project would improve road conditions so that road runoff does not contribute to water quality degradation. Mitigation measures included in this EIR also require the County to restore disturbed areas, protect sensitive biological resources including special-status fish, amphibian and reptile species, and implement Best Management Practices to reduce stormwater runoff and protect water quality. The SCA benefits

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	or partially in an SCA, the land division shall be designed to ensure that no development occurs within the SCA.	associated with the proposed rehabilitation of an existing deteriorated roadway, combined with implementation of the EIR recommended mitigation measures are consistent with the provisions of the County's SCA policies.
Program BIO-4p	**Implement NPDES Phase II.** Continue to implement NPDES Phase II permit requirements relating to peak flow controls to ensure that project related and cumulative impacts to peak flows are minimized or avoided through conditions on project approval as required by the ordinances.	**Consistent.** Mitigation Measure BIO-2 requires preparation of a SWPPP, consistent with the requirements of the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities. The SWPPP shall include Best Management Practices (BMPs) to reduce potential impacts to surface water quality during the construction period. With implementation of this mitigation measure, the project would be consistent with County efforts to implement NPDES Phase II.
Water Resources		
Goal WR-1	**Healthy Watersheds.** Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water	**Consistent.** The proposed project would rehabilitate an existing roadway. No change in land use would occur as a result of the proposed project. Construction activities associated with project implementation could affect natural resources, including streams and wetlands within the project area. However, mitigation measures provided in this EIR would reduce any potential impacts to a less-than-significant level. With implementation of these mitigation measures, the project would be consistent with County efforts to protect watersheds and aquifer recharge.
Policy WR-1.1	**Protect Watersheds and Aquifer Recharge.** Give high priority to the protection of watersheds, aquifer-recharge areas, and natural drainage systems in any consideration of land use.	**Consistent.** See above.
Policy WR-1.3	**Improve Infiltration**. Enhance water infiltration throughout watersheds to decrease accelerated runoff rates and enhance groundwater recharge. Whenever possible, maintain or increase a site's predevelopment infiltration to reduce downstream erosion and flooding.	**Consistent.** See above.
Program WR-1.e	**Require Restoration of Degraded Areas.** Require replanting of vegetation and remediation of associated erosion in conjunction with requested land use approvals, especially those including roads and over-grazing on steep slopes.	**Consistent.** Mitigation Measures BIO-5, BIO-6, and BIO-7 require that the County restore disturbed areas to after temporary project activities are complete by implementing replacement planting for impacted areas. With implementation of Mitigation Measures BIO-5, BIO-6, and BIO-7, the project would be consistent with Program WR-1.e.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Goal WR-2	**Clean Water.** Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses. (Policies on water availability are found in the Public Facilities and Services Section of the Built Environment Element.)	**Consistent.** As described in Section 4.6, Hydrology and Water Quality, the proposed project would have a less-than-significant impact on groundwater supplies or recharge. However, construction activities could result in the release of pollutants into adjacent creeks/streams in the project area. Mitigation Measure BIO-2 requires project compliance with the NPDES General Construction Permit, including preparation of a SWPPP and implementation of BMPs to minimize construction impacts on water quality. With implementation of this Mitigation Measure, the project would be consistent with County policies to ensure water supplies are clean.
Policy WR-2.1	**Reduce Toxic Runoff.** Reduce the volume of urban runoff from pollutants — such as pesticides from homes, golf courses, cleaning agents, swimming pool chemicals, and road oil — and of excess sediments and nutrients from agricultural operations.	**Consistent.** Mitigation Measure BIO-2 requires the County to prepare a SWPPP designed to reduce potential impacts to surface water quality through the project construction period. The SWPPP shall include, as applicable, all Best Management Practices (BMPs) consistent with the BMPs requirements in the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. In addition, Mitigation Measure HAZ-1 requires preparation and implementation of a Construction Risk Management Plan (CRMP) to protect construction workers, the general public, and the environment from hazardous materials that could be disturbed during roadway rehabilitation and trench dewatering activities. With implementation of these mitigation measures, the project would be consistent with County policies to protect water quality, including reducing pollutants in stormwater runoff and preventing excess sedimentation and erosion.
Policy WR-2.2	**Reduce Pathogen, Sediment, and Nutrient Levels.** Support programs to maintain pathogen and nutrient levels at or below target levels set by the Regional Water Quality Control Board, including the efforts of ranchers, dairies, agencies, and community groups to address pathogen, sediment, and nutrient management in urban and rural watersheds.	**Consistent.** See above.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Policy WR-2.3	**Avoid Erosion and Sedimentation.** Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and on-site sediment retention. Require developments to include on-site facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.	**Consistent.** See above.
Policy WR-2.4	**Design County Facilities to Minimize Pollutant Input.** Design, construct, and maintain County buildings, landscaped areas, roads, bridges, drainages, and other facilities to minimize the volume of toxics, nutrients, sediment, and other pollutants in stormwater flows, and continue to improve road maintenance methods to reduce erosion and sedimentation potential.	**Consistent.** The proposed project is consistent with County policies to minimize pollutant input from roads because the project includes drainage improvements to accommodate stormflows, and filter runoff prior to discharge.
Environmental Hazards		
Goal EH-2	**Safety from Seismic and Geologic Hazards.** Protect people and property from risks associated with seismic activity and geologic conditions.	**Consistent.** As described in Section 4.5, Geology and Soils, the proposed project could be subject to geologic hazards, including seismic ground shaking, expansive or corrosive soils, and landslides. Implementation of the mitigation measures provided in this EIR would reduce potential impacts associated with geologic hazards. Implementation of these recommended mitigation measures would ensure project consistency with the County's seismic and geologic safety policy. .
Policy EH-2.1	**Avoid Hazard Areas.** Require development to avoid or minimize potential hazards from earthquakes and unstable ground conditions.	**Consistent.** A geotechnical investigation has been prepared for the proposed waterline replacement. In addition, Marin County DPW shall review the Geotechnical Investigation along with final project plans to confirm that proposed improvements fully comply with the County of Marin Uniform Construction Standards and that the Geotechnical Investigation recommendations have been incorporated. Compliance with the recommended mitigation measures and the applicable constructions standards ensure project consistency with roadway seismic safety standards.
Policy EH-2.3	**Ensure Seismic Safety of New Structures.** Design and construct all new buildings to be earthquake resistant. The minimum level of design necessary would be in accordance with seismic provisions and criteria contained in the most recent version of the State and County Codes.	**Consistent.** A geotechnical investigation has been prepared for the proposed waterline replacement. In addition, Marin County DPW shall review the Geotechnical Investigation along with final project plans to confirm that proposed improvements fully comply with the County of Marin Uniform Construction

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
	Construction would require effective oversight and enforcement to ensure adherence to the earthquake design criteria.	Standards and that the Geotechnical Investigation recommendations have been incorporated. Compliance with the recommended mitigation measures and the applicable constructions standards ensure project consistency with roadway seismic safety standards.
Program EH-2.a	**Require Geotechnical Reports.** Continue to require any applicant for land division, master plan, development approval, or new construction in a geologic hazard area to submit a geotechnical report prepared by a State-certified Engineering Geologist or a Registered Geotechnical Engineer that: evaluates soil, slope, and other geologic hazard conditions; commits to appropriate and comprehensive mitigation measures sufficient to reduce risks to acceptable levels, including post-construction site monitoring, if applicable; addresses the impact of the project on adjacent lands, and potential impacts of offsite conditions; and meets the requirements of other agency regulations with jurisdiction in the hazard area.	**Consistent.** As described in Section 4.5, Geology and Soils, a geotechnical investigation has been prepared for the proposed waterline replacement. The proposed project is consistent with this Program EH-2.a because a site-specific geotechnical investigation was conducted for the proposed project that explored and evaluated geologic and geotechnical soil conditions of the project area, including a field investigation and soil borings, in order to provide geotechnical conclusions and recommendations for the design of the pavement rehabilitation and stabilization.
Program EH-2.b	**Require Construction Observation and Certification.** Require any work or construction undertaken to correct slope instability or mitigate other geologic hazard conditions to be supervised and certified by a geotechnical engineer and/or an engineering geologist.	**Consistent**. The implementation of Mitigation Measure GEO-1 ensures that a qualified professional will observe soil conditions in the field during the rehabilitation process thereby making the project consistent with Program EH-2.b. Further, all design criteria and specifications made by the geotechnical consultant while monitoring the project shall be implemented to reduce impacts associated with problematic soils.
Program EH-2.f	**Avoid Known Landslides Areas.** Continue to prohibit development in landslide areas and on landslide-prone deposits on steep slopes, except where the required geotechnical report indicates that appropriate mitigation measures can stabilize the site for construction.	**Consistent.** As discussed in Section 4.5, Geology and Soils, the proposed project area is relatively flat and, therefore, not subject to slope failures and/or slope instability. The proposed project is consistent with Program EH-2.f because the project would improve road conditions.
Program EH-2.g	**Identify Compressible Soil Potential.** Require that geotechnical reports for projects on land underlain by compressible materials (such as fill, bay mud, and marsh or slough areas) delineate locations where settlement will be greatest and subsidence may occur, and recommend site preparation and construction techniques necessary to reduce risk and public liability to an acceptable level.	**Consistent.** Mitigation Measure GEO-1 requires that the designers and engineers of proposed improvements consider the site's potential to be underlain by soils with moderate to high shrink-swell potential a qualified professional observe soil conditions in the field during the rehabilitation process. If locations along the alignment of SFDB are underlain by expansive soils and/or non-engineered fill, the geotechnical consultant to the project shall determine if the soils encountered are problematic, and shall make recommendations to ensure potential damage related to expansive soils and non-uniformly compacted fills are minimized. All

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
		design criteria and specifications set forth in the Geotechnical Investigation and as made by the geotechnical consultant while monitoring the project shall be implemented to reduce impacts associated with problematic soils thereby ensuring project consistency with Program EH-2.g.
Program EH-2.m	**Implement Geological Assessment Ordinances.** Continue to implement ordinances requiring geological assessment (e.g., Preliminary Soils, Soils Investigation, and Geologic/Geotechnical reports) for new subdivisions and grading permits to identify the presence of surface fault rupture.	**Consistent.** As described in Section 4.5, Geology and Soils, a site-specific geotechnical investigation was conducted for the proposed project that explored and evaluated geologic and geotechnical soil conditions of the project area, including a field investigation and soil borings, in order to provide geotechnical conclusions and recommendations for the design of the pavement rehabilitation and stabilization. The proposed project is consistent with Program EH-2m.
Program EH-2.q	**Implement Subsidence Evaluation Guidelines.** Continue to implement ordinances that provide guidelines for subsidence evaluations of land that is or could be prone to subsidence. Require geological assessment (e.g., Preliminary Soils, Soils Investigation, and Geologic/Geotechnical reports) for new subdivisions and grading permits to identify hazards associated with subsidence and settlement.	**Consistent.** See above.
Program EH-2.r	**Implement Soil Classification and Design Guidelines.** Continue to implement ordinances that provide soil classification guidelines and design considerations for development in areas of expansive soils, as well as requiring geological assessment (e.g., Preliminary Soils, Soils Investigation, and Geologic/Geotechnical reports) for new subdivisions and grading permits to identify hazards associated with expansive soils.	**Consistent.** See above.
Goal EH-3	**Safety from Flooding and Inundation.** Protect people and property from risks associated with flooding and inundation. (Also see the Public Facilities and Water Resources sections.)	**Consistent.** The project is consistent with this goal because it would not place people or property at risk from flooding or inundation. The proposed project would rehabilitate the existing roadway. No residential or commercial uses would be built because of the proposed project. The project also proposes drainage improvements to accommodate proposed intersection modifications. The proposed project would use a portion of the landscaping area to implement storm water quality facilities such as bioretention areas and pervious pavement. These features would remove pollutants and contaminants from storm water runoff prior to discharge to Corte Madera Creek. Therefore, the proposed project would be consistent with Goal EH-3.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Policy EH-3.2	**Retain Natural Conditions.** Ensure that flow capacity is maintained in stream channels and floodplains, and achieve flood control using biotechnical techniques instead of storm drains, culverts, riprap, and other forms of structural stabilization.	**Consistent.** As described in the preceding, the proposed project is consistent with this Policy EH-3.2 because drainage improvements included in the proposed project would incorporate biotechnical techniques such as bioretention areas and pervious pavement in addition to culverts and other stabilization techniques.
Policy EH-3.3	**Monitor Environmental Change.** Consider cumulative impacts to hydrological conditions, including alterations in drainage patterns and the potential for a rise in sea level, when processing development applications in watersheds with flooding or inundation potential.	**Consistent.** Section 6.0 of this EIR provides a discussion of the cumulative impacts of the proposed project. Construction activities and operation of the roadway also have the potential to degrade the quality of surface water and creeks in Marin County. The implementation of mitigation measures outlined in Section 4.6, Hydrology and Water Quality would reduce the project's hydrology and water quality impacts to a less-than-significant level. Other planned projects in the County would likely be required to implement similar measures. Therefore, the proposed project would not result in a significant cumulative hydrology or water quality impact.
Policy EH-3.4	**Consider Flood Inundation.** Consider flood inundation resulting from upstream dam failures when assessing flood hazards for environmental review and implementing associated programs within the County.	**Consistent.** As described in Section 4.6, Hydrology and Water Quality, the proposed project area is not included in a dam inundation area. Therefore, the proposed project would not result in flood inundation resulting from dam failure.
Program EH-3.f	**Require Hydrologic Studies.** Continue to require submission of detailed hydrologic and geologic studies for any proposed development that could increase sedimentation of a watercourse or alter natural drainage patterns. Amend the Development Code to include findings to continue to regulate development in flood prone areas to ensure public health and safety and to preserve the hydraulic and geomorphic integrity of the stream system and associated habitat.	**Consistent.** As described in Section 4.6, Hydrology and Water Quality, implementation of the proposed project would not increase sedimentation or alter natural drainage patterns nor would it expose people or property to risks associated with flooding or inundation.
Program EH-3.h	**Retain Ponding Areas.** Maintain publicly controlled flood ponding areas in a natural state for flood control, and continue to promote compatible uses in ponding areas, such as agriculture, open space, and recreation.	**Consistent.** As described in Section 4.6, Hydrology and Water Quality, implementation of the proposed project would not affect publicly controlled flood ponding areas. The proposed project would include bioretention areas and pervious pavement to remove pollutants and contaminants from storm water runoff prior to discharge to Corte Madera Creek. These features would also improve infiltration. Therefore, the proposed project would be consistent with Program EH-3.h.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Program EH-3.k	**Anticipate Climate Change Impacts, Including Sea Level Rise.** Recent predictions of sea level rise for the San Francisco Bay region by BCDC and USGS based on climate models and hydrodynamic modeling of the San Francisco Bay Estuary Institute indicate 16 inches of rise by mid century and 55 inches by 2100. Cooperate with the U.S. Geological Survey, the San Francisco Bay Conservation and Development Commission, the California Landscape Cooperative's Climate Commons project and other monitoring agencies to track bay and ocean levels and share baseline topographic and resource data obtained by the County in implementing its own projects to enhance hydrodynamic and ecosystem modeling efforts and assessment of regional climate change impacts. Use official estimates for mean sea level rise and topographic data for environmental review. Environmental review for development applications and County infrastructure shall incorporate official mid-century sea level rise estimates, and require adaptive strategies for end-of-century sea level rise for any such project with expected life times beyond 2050.	**Consistent.** As described in Section 4.6, the proposed project is not located in an area that is susceptible to inundation from sea-level rise. Therefore, the proposed project is consistent with Program EH-3.k.
Atmosphere and Climate		
Goal AIR-1	**Improved Regional Air Quality.** Promote planning and programs that result in the reduction of airborne pollutants measured within the county and the Bay Area.	**Consistent.** Long-term operation of the roadway would not result in an increase in airborne pollutants within the county or the Bay Area. However, short-term degradation of local air quality may occur during construction due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include carbon monoxide (CO), nitrogen oxides (NO_x), volatile organic compounds (VOCs), directly emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter. Implementation of Mitigation Measure AIR-1 would reduce potential air quality impacts associated with project construction to a less-than-significant level thereby making the project consistent with this goal.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Policy AIR-1.3	**Require Mitigation of Air Quality Impacts.** Require projects that generate potentially significant levels of air pollutants, such as quarry, landfill operations, or large construction projects, to incorporate best available air quality mitigation in the project design.	**Consistent.** The project is consistent with this policy because the incorporation of EIR recommended air quality mitigation measures into the project will reduce potential air quality impacts associated with project construction.
Program AIR-1.b	**Evaluate Air Quality Impacts of Proposed Projects and Plans.** As part of the Environmental Review Process, use the current BAAQMD CEQA Guidelines to evaluate the significance of air quality impacts from projects or plans, and to establish appropriate minimum submittal and mitigation requirements necessary for project or plan approval.	**Consistent.** Section 4.9, Air Quality, in this EIR describes the potential air quality impacts that could result from implementation of the proposed project. Mitigation measures included in Section 4.9 would reduce potential air quality impacts associated with the proposed project to a less-than-significant level.
Program AIR-1.g	**Require Control Measures for Construction and Agricultural Activity.** Require reasonable and feasible measures to control particulate emissions (PM-10 and PM-2.5) at construction sites and during agricultural tilling activity, pursuant to the recommendations in the BAAQMD CEQA Guidelines, which may include the following: • Watering active construction or agricultural tilling areas. • Covering hauled materials. • Paving or watering vehicle access roads. • Sweeping paved and staging areas.	**Consistent.** Mitigation Measure AIR-1, included in this EIR (see Section 4.2, Air Quality) would reduce potential particulate emissions associated with project construction to a less-than-significant level.
Goal AIR-2	**Protection from Emissions.** Minimize the potential impacts from land uses that may emit pollution and/or odors on residential and other land uses sensitive to such emissions (see Map 2-16, Sensitive Receptor Sites in Unincorporated Marin County).	**Consistent.** Sensitive receptors located near the project alignment include single-family and multi-family residences, and schools. The proposed project would result in temporary impacts from PM_{10} and construction equipment emissions that could affect these sensitive receptors. Mitigation Measure AIR-1, included in this EIR (see Section 4.2, Air Quality) would reduce potential particulate emissions and construction equipment emissions associated with project construction to a less-than-significant level.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Program AIR-2.b	**Protect Sensitive Receptors Near High-Volume Roadways.** Amend the Development Code to require mitigation measures such as increased indoor air filtration to ensure the protection of sensitive receptors (facilities where individuals are highly susceptible to the adverse effects of air pollutants, such as housing, child care centers, retirement homes, schools, and hospitals) near freeways, arterials, and other major transportation corridors.	**Consistent.** See above.
Goal AIR-3	**Reduction of Vehicle-Generated Pollutants**. Reduce vehicle trips and emissions, and improve vehicle efficiency, as means of limiting the volume of pollutants generated by traffic.	**Consistent.** Mitigation Measure GCC-1, included in this EIR (see Section 4.6, Global Climate Change), provides Best Management Practices recommended by the BAAQMD to reduce GHG emissions during project construction. Implementation of this mitigation measure would reduce impacts associated with greenhouse gas emissions during construction to a less-than-significant level.
Policy AIR-3.1	**Institute Transportation Control Measures.** Support a transportation program that reduces vehicle trips, increases ridesharing, and meets or exceeds the Transportation Control Measures recommended by BAAQMD in the most recent Clean Air Plan to reduce pollutants generated by vehicle use.	**Consistent.** The project is consistent with this policy because the incorporation of EIR recommended air quality mitigation measures into the project will reduce potential air quality impacts associated with project construction.
Program AIR-3.d	**Reduce Peak-Hour Congestion.** Implement recommended BAAQMD Transportation Control Measures in the Clean Air Plan to reduce vehicle emissions and congestion during peak commute periods.	**Consistent.** The proposed project would rehabilitate the existing roadway and implement improvements to improve traffic flow and reduce congestion during peak periods. Therefore, the proposed project is consistent with the County's intent to reduce peak-hour congestion.
Program AIR-3.e	**Improve Arterial Traffic Management.** Modify arterial roadways to allow more-efficient bus operation, including possible signal preemption, and expand signal-timing programs where air quality benefits can be demonstrated.	**Consistent.** The proposed project would rehabilitate the existing roadway and implement improvements to improve traffic flow and reduce congestion during peak periods. Therefore, the proposed project is consistent with the County's intent to improve arterial traffic management.
Goal AIR-4	**Minimization of Contributions to Greenhouse Gases.** Prepare policies that promote efficient management and use of resources in order to minimize greenhouse gas emissions. Incorporate sea level rise and more extreme weather information into the planning process.	**Consistent.** Mitigation Measure GCC-1, included in this EIR (see Section 4.6, Global Climate Change), provides Best Management Practices recommended by the BAAQMD to reduce GHG emissions during project construction. Implementation of this mitigation measure would reduce impacts associated with greenhouse gas emissions during construction to a less-than-significant level.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Policy AIR-4.1	**Reduce Greenhouse Gas Emissions**. Adopt practices that promote improved efficiency and energy management technologies; shift to low-carbon and renewable fuels and zero emission technologies.	**Consistent.** The project is consistent with this policy because the incorporation of EIR recommended air quality mitigation measures into the project will reduce potential air quality impacts associated with project construction.
Program AIR-4.b	**Reduce Greenhouse Gas Emissions Resulting from Transportation.** Increase clean-fuel use, promote transit-oriented development and alternative modes of transportation, and reduce travel demand. (Also see TR-4, AIR-3, DES-2, HS-2, HS-3, CD-2, CD-3, and EC-1.)	**Consistent.** The proposed project entails rehabilitation of an existing roadway to improve function and safety. Implementation of the proposed project would not accommodate additional traffic levels on Sir Francis Drake Boulevard, but would improve road conditions for existing traffic levels. Improved roadway conditions should promote vehicle performance and a marginal, but un-measurable, reduction in vehicle emissions.
Trails		
Goal TR-1	**Trail Network Preservation and Expansion.** Preserve existing trail routes designated for public use on the Marin Countywide Trails Plan maps, and expand the public trail network for all user groups, where appropriate. Facilitate connections that can be used for safe routes to school and work.	**Consistent.** The proposed project would not affect existing trails near the project site. Implementation of the proposed project would result in a less hazardous roadway environment for bicyclists because the roadway would have a uniform smoother surface. The Marin County Unincorporated Area Bicycle and Pedestrian Master Plan identifies the project area as the Sir Francis Drake Bikeway Study Area and shows a Class II bike lane along SFDB as part of the proposed bikeway network. The project would not inhibit completion of the study or implementation of the Plan.
Policy TR-1.1	**Protect the Existing Countywide Trail System.** Maintain the existing countywide trail system and protect the public's right to access it.	**Consistent.** See above.
Policy TR-1.2	**Expand the Countywide Trail System.** Acquire additional trails to complete the proposed countywide trail system, providing access to or between public lands and enhancing public trail use opportunities for all user groups, including multi-use trails, as appropriate.	**Consistent.** As described above, implementation of the proposed project would improve roadway conditions for vehicles, bicyclists, and pedestrians. The Marin County Unincorporated Area Bicycle and Pedestrian Master Plan identifies the project area as the Sir Francis Drake Bikeway Study Area and shows a Class II bike lane along SFDB as part of the proposed bikeway network. The project would not inhibit completion of the study or implementation of the Plan.
Community Development		
Goal CD-1	**Environmental Corridor Land Use Framework.** Establish, maintain, and continue to improve a broad land use management framework using the County's environmental corridors as a basis for local policies and regulation, and to maintain the character of each of the corridors.	**Consistent.** The proposed project is located in the City-Centered Corridor. Implementation of the proposed project would rehabilitate an existing roadway to improve its longevity and safety. It would not conflict with the goals and policies designed to protect the character of the City-Centered Corridor.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Policy CD-1.1	**Direct Land Uses to Appropriate Areas.** Concentrate urban development in the City-Centered Corridor, where infrastructure and facilities can be made available most efficiently. Protect sensitive lands in the Baylands Corridor. Emphasize agricultural uses in the Inland Rural Corridor, along with preservation of resources, habitat, and existing communities. Focus on open space, recreational, and agricultural land uses, as well as preservation of existing communities in the Coastal Corridor.	**Consistent.** The proposed project entails rehabilitating the existing roadway within the Marin County right-of-way. Additional traffic capacity would not be provided as a result of implementing the proposed project. The proposed project would not affect existing land uses within the City-Centered Corridor. Although the project has been designed to minimize environmental impacts, construction activities could affect natural resources and wildlife habitat. However, incorporation of recommended mitigation measures in Section 4.3, Biological Resources, would ensure project consistency with the resource preservation provisions of Policy CD-1.1
Policy CD-1.2	**Direct Urban Services.** Discourage extension of urban levels of service to serve new development beyond urban service areas.	**Consistent.** The proposed project entails rehabilitating the existing roadway within the Marin County right-of-way. Additional traffic capacity would not be provided as a result of implementing the proposed project. The proposed project would not affect existing land uses within the City-Centered Corridor or extend urban levels of service to serve new development beyond urban service areas. Therefore, the proposed project would be consistent with Policy CD-1.2.
Program CD-1.a	**Keep Urban Uses in the City-Centered Corridor.** Update the Development Code as necessary to ensure that urban development is confined primarily to the City-Centered Corridor, and designate specific areas within and surrounding the corridor for resource protection, including the Ridge and Upland Greenbelt Area, the Streamside Conservation Area, designated wetlands, and undeveloped historic baylands and floodplains (see Maps 3-1a and 3-1b, Environmental Features Focusing Development Within the City-Centered Corridor).	**Consistent.** The proposed project entails rehabilitating the existing roadway within the Marin County right-of-way within the City-Centered Corridor. It would not create new urban development outside of the City-Centered Corridor. Therefore, the proposed project would be consistent with Program CD-1.a.
Program CD-1.h	**Consider Future Threat of Sea Level Rise.** Consider revising Policy CD-1.3 to include properties threatened by sea level rise as more information about the sea level rise threat becomes available.	**Consistent.** As described in Section 4.6, the proposed project is not located in an area that is susceptible to inundation from sea-level rise. Therefore, the proposed project is consistent with Program CD-1.h.
Policy CD-2.8	**Limit Development in Resource or Hazard Areas.** Discourage development in areas with high natural resource value or threats to life or property, and restrict development in such areas to minimize adverse impacts.	**Consistent.** The proposed project would rehabilitate an existing roadway within Marin County. SFDB traverses a high value natural resource area, but also provides a vital transportation connection between the urbanized eastern and rural western regions of the County. Proposed roadway improvements will not increase the vehicle capacity of the roadway; therefore the project will not promote new development in localities served by the roadway.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Goal CD-4	**Coordinate Planning with Other Jurisdictions.** Coordinate implementation of the Countywide Plan with community plans and planning efforts by local cities, towns, and special districts, and adjacent counties, as well as regional, State, and federal agencies.	**Consistent.** In compliance with CEQA, adjacent jurisdictions, including Kentfield, Larkspur, and Ross, were sent a Notice of Preparation and will have the opportunity to review and comment on this EIR during the public review period.
Policy CD-4.3	**Participate with Regional, State, and Federal Agencies.** Coordinate with nearby counties, and with State and federal agencies, regarding regional land use and transportation planning.	**Consistent.** In compliance with CEQA, Responsible and Trustee Agencies, including the Regional Water Quality Control Board, California Department of Fish and Wildlife and others were sent a Notice of Preparation and will have the opportunity to review and comment on this EIR during the public review period.
Program CD-4.c	**Coordinate with Adjacent Jurisdictions.** Provide comments as feasible on the general plan updates or proposed major development projects, and participate in cooperative transportation and land use planning efforts with nearby jurisdictions. Seek comments from neighboring jurisdictions on the Marin Countywide Plan and other County planning efforts.	**Consistent**. See above.
Program CD-4.d	**Coordinate with State and Federal Authorities.** Coordinate with the National Park Service, the State Department of Parks and Recreation, and other appropriate agencies during review of development proposed for property within or adjacent to State or federal lands within and adjacent to Marin County.	**Consistent**. See above.
Community Design		
Goal DES-1	**Preservation of Community Character.** Perpetuate the unique character of each community, including the essential design characteristics that make it attractive and livable.	**Consistent.** As described in Section 4.2, Aesthetics, most aspects of the proposed project including repaving the roadway, intersection modifications, and safety improvements would not significantly affect the visual character or scenic quality of the roadway and its surroundings. Tree removal and the installation of retaining walls associated with the proposed project would slightly change the visual experience for those familiar with traveling the roadway but would not alter the visual character of the roadway or the project area given the largely urban nature of the project area. Accordingly, the proposed project would be consistent with Goal DES-1.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Goal DES-4	**Protection of Scenic Resources.** Minimize visual impacts of development and preserve vistas of important natural features.	**Consistent** See above.
Policy DES-4.1	**Preserve Visual Quality.** Protect scenic quality and views of the natural environment — including ridgelines and upland greenbelts, hillsides, water, and trees — from adverse impacts related to development.	**Consistent.** See above.
Program DES-4b	**Minimize Visual Impacts of Public Facilities.** Amend applicable codes and procedures to require appropriate placement, design, setbacks, and native landscaping of public facilities (including soundwalls, medians, retaining walls, power lines, and water tanks) to reduce visual impacts, and encourage local agencies to adopt similar standards.	**Consistent.** See above.
Goal DES-5	**Attractive and Functional Streets and Parking Areas.** Design automobile use areas to fit the character of the community, and comfortably accommodate travel by pedestrians and bicyclists, while still meeting health, safety, and emergency access needs.	**Consistent** See above.
Policy DES-5.1	**Achieve Streetscape Compatibility.** Ensure that roadways, parking areas, and pedestrian and bike movement are functionally and aesthetically appropriate to the areas they serve.	**Consistent.** See above.
Transportation		
Goal TR-1	**Safe and Efficient Movement of People and Goods.** Provide a range of transportation options that meet the needs of residents, businesses, and travelers.	**Consistent.** The proposed project would rehabilitate the existing roadway to improve traffic flow and enhance safety for bicyclists and pedestrians and is consistent with Goal TR-1.
Policy TR-1.1	**Manage Travel Demand.** Improve the operating efficiency of the transportation system by reducing vehicle travel demand and provide opportunities for other modes of travel. Before funding transportation improvements consider alternatives — such as Transportation Demand Management (TDM) — and prioritize projects that will reduce fossil fuel use and reduce single-occupancy vehicle trips.	**Consistent.** The proposed project entails rehabilitating the existing roadway to improve traffic flow and safety. Although a third eastbound travel lane would be provided from El Portal Drive to Highway 101, additional traffic capacity would not be provided as a result of implementing the proposed project. The additional lane would be provided to accommodate existing traffic volumes and relieve congestion during the peak periods. The proposed project would also improve safety for bicyclists and pedestrians. Therefore, the proposed project would be consistent with Policy TR-1.1.

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Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Policy TR-1.2	**Maintain Service Standards.** Establish level of service standards for vehicles on streets and highways and performance standards for transit (see Map 3-8, Roadway Network of Marin County), bicycles, pedestrians, and other modes of transportation.	**Consistent.** The proposed project entails rehabilitating the existing roadway to improve traffic flow and safety. Although a third eastbound travel lane would be provided from El Portal Drive to Highway 101, additional traffic capacity would not be provided as a result of implementing the proposed project. The additional lane would be provided to accommodate existing traffic volumes and relieve congestion during the peak periods. The proposed project would also improve safety for bicyclists and pedestrians. Therefore, the proposed project would be consistent with Policy TR-1.2.
Program TR-1.e	**Uphold Vehicle Level of Service Standards.** Uphold peak-hour vehicle Level of Service standard LOS D or better for urban and suburban arterials and LOS E or better for freeways and rural expressways. Only the Congestion Management Program– specified roadway and highway segments operating at a lower LOS than the standard in 1991 are grandfathered and may continue to operate at the lower LOS standard until such time as the roads are improved or the traffic load or demand is reduced or diverted. An improvement plan should be developed for Highway 101 and the grandfathered roadway segments to address existing deficiencies. Unless determined to be infeasible, alternatives that reduce fossil fuels and single occupancy vehicle use should be considered a priority over infrastructure improvements such as road widening. New development shall be restricted to the lowest end of the applicable residential density/commercial floor area ratio range where the LOS standards will be exceeded at any intersection or road segment or worsened on any grandfathered segment. Densities higher than the low end of the applicable residential density/commercial floor area ratio may be considered for the following: • Development that qualifies as Housing Overlay Projects in accordance with Policy CD-2.3, Establish a Housing Overlay Designation, and Program CD-2.d, Implement the Housing Overlay Designation. • Mixed-use projects developed in accordance with Policy CD-8.7.	**Consistent.** The proposed project entails rehabilitating the existing roadway to improve traffic flow and relieve congestion. A third eastbound travel lane from El Portal Drive to Highway 101, along with various intersection improvements would be provided to accommodate existing vehicle traffic and improve the flow for vehicles from El Portal Drive to Highway 101. However, no additional capacity would be provided with implementation of the proposed project. Proposed roadway improvements would result in improved conditions for vehicles, pedestrians, and bicyclists because the roadway would have a uniform smoother surface, intersection operations would be improved, and improvements to enhance pedestrian safety would be implemented (e.g., reduced crossing distances, widening sidewalks).

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
	• Second units developed pursuant to State law. • New housing units affordable to very low and low income households. All projects shall be conditioned to include feasible mitigation measures for project-related traffic impacts.	
Program TR-1.g	**Determine Appropriate Mitigation.** Work with the Transportation Authority of Marin to monitor the traffic impacts of development and identify mitigation requirements for proposed development that would cause a drop below adopted LOS, including transportation system improvements (see Maps 3-6a and 3-6b), impact fees, Transportation Demand Management strategies, direct support of alternative travel modes, or redesign of the development projects for transportation improvements. Amend the Development Code to incorporate those requirements. Require the preparation of a traffic impact analysis report to identify impacts and mitigation measures for projects that may result in significant traffic impacts. The following proposed transportation system improvements are not fully funded but have the potential to reduce regional and project-related traffic impacts. Before implementation, these improvements must be further evaluated in accordance with Policy TR-1.5, Require Necessary Transportation Improvements: • Widen or compete other operational improvements on Sir Francis Drake Boulevard between Bon Air Road and Wolfe Grade • Consider widening Sir Francis Drake Boulevard from two to three lanes in each direction from Highway 101 to Eliseo Drive	**Consistent.** The proposed project would implement two of the transportation system improvements identified in Program TR-1.g; therefore, the proposed project would be consistent with this program.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Program TR-1.n	**Obtain and Dedicate Transportation Funding.** Apply for funds from State and federal sources, and use general funds, fees, privately funded improvements, user charges, and local taxes for transportation improvements to provide improvements called for in the Transportation Vision, maintain service levels at established standards, and meet multimodal objectives.	**Consistent.** Funding to study and implement improvements to SFDB originates through the Transportation Authority of Marin's Measure A program under Strategy 3 for major roads and related infrastructure. At this time, sufficient funds are not available to construct all of the project elements. In the initial phase, the County would complete the improvements associated with pavement rehabilitation, congestion relief, and pedestrian safety. The County intends to add additional elements as funds become available.
Goal TR-2	**Increased Bicycle and Pedestrian Access.** Expand bicycle and pedestrian facilities and access in and between neighborhoods, employment centers, shopping areas, schools, and recreational sites (see Maps 3-9a, 3-9b, and 3- 9c, Bikeways of Marin County).	**Consistent.** As previously discussed, implementation of the proposed project would improve conditions for bicyclists and pedestrians using SFDB. The Marin County Unincorporated Area Bicycle and Pedestrian Master Plan identifies a Class II bike route along SFDB as part of the proposed bikeway network. The project does not inhibit the completion of that plan.
Policy TR-2.1	**Improve the Bicycle and Pedestrian Network.** Promote adequate bicycle and pedestrian links, to the extent feasible, throughout the county, including streetscape improvements and standards that are safe and pedestrian and bicycle friendly.	**Consistent.** As previously discussed, implementation of the proposed project would improve conditions for bicyclists and pedestrians using SFDB. The proposed roadway improvements, including shortened crossing distances, widened sidewalks, and increased visibility of pedestrians, would promote bicycle and pedestrian links, particularly to schools within the project corridor.
Policy TR-2.g	**Add Bicycle Lanes.** Identify roads with shoulders wide enough to be designated as bicycle lanes, and, where feasible, stripe and sign appropriate roadway segments as bike lanes and bike routes.	**Consistent.** According to the 2008 Marin County Unincorporated Area Bicycle and Pedestrian Plan, SFDB is categorized as a Proposed Class 2 bicycle route (bike lane). However, SFDB through the project area does not always have sufficient width to provide for designated bike lanes. The proposed project would include access improvements for bicyclists and pedestrians along the corridor, including improved intersection crossings and widened sidewalks.
Goal TR-4	**Protection of Environmental Resources.** Minimize environmental disruption and energy use related to transportation.	**Consistent.** The proposed project would occur entirely within the existing right-of-way; no additional land would be required to complete the proposed project. The project has been designed to minimize environmental impacts associated with roadway construction and would improve vehicle traffic flow, thereby potentially resulting in more efficient energy use. Construction activities could affect aesthetic, biological, cultural, and water resources. Mitigation measures provided in this EIR would reduce these impacts to a less-than-significant level.
Policy TR-4.1	**Minimize Disturbance and Condemnation.** Limit environmental disruption and condemnation of land due to transportation projects.	**Consistent.** See above.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Policy TR-4.2	**Recycle and Conserve Energy.** Include recycled and energy-conserving materials for road construction and repair, where feasible.	**Consistent.** As described in Chapter 3.0, Project Description, the proposed project would include recycling of construction materials, to the extent feasible. In addition, proposed pavement repair would improve the operation of the roadway, thereby conserving energy.
Program TR-4.a	**Limit Project Impacts.** Work with Caltrans and private transportation contractors to minimize environmental damage and storm water runoff through best management practices, and to avoid condemnation of private or publicly owned land in conjunction with transportation improvement projects.	**Consistent.** The proposed project would implement Best Management Practices to reduce storm water runoff and other water quality impacts associated with project construction. See Section 4.3, Biological Resources and Section 4.6 Hydrology and Water Quality.
Program TR-4.b	**Use Recycled and Resource Efficient Materials.** Use resource efficient materials, such as rubberized asphalt concrete and pervious pavement, in road repair and construction wherever cost effective and feasible.	**Consistent.** As described in Chapter 3.0, Project Description, the proposed project would include use of pervious pavement to remove pollutants and contaminants from storm water runoff prior to discharge to Corte Madera Creek.
Noise		
Goal NO-1	**Protection from Excessive Noise.** Ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life.	**Consistent.** As described in Section 4.10, Noise, the proposed project would not increase existing roadway noise levels in the project area. The proposed roadway improvements will reduce the noise levels now generated by vehicles passing over a deteriorated roadway surface. Although construction noise would result in a temporary or periodic increase in ambient noise levels in the project area above the existing ambient noise level, the long term ambient noise level after project construction will be incrementally lower. Implementation of Mitigation Measure NOI-1, identified in this EIR, would reduce potential construction noise impacts to less-than-significant levels.
Policy NO-1.2	**Minimize Transportation Noise.** Ensure that transportation activities do not generate noise beyond acceptable levels, including in open space, wilderness, wildlife habitat, and wetland areas.	**Consistent.** Implementation of the proposed project is not expected to increase traffic on Sir Francis Drake Boulevard; therefore, the project would not increase permanent noise levels at sensitive receptors in the project vicinity. Therefore, the proposed project would be consistent with Policy NO-1.2 to minimize transportation noise.
Policy NO-1.3	**Regulate Noise Generating Activities.** Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.	**Consistent.** Implementation of Mitigation Measure NOI-1will limit construction activities to the less-noise sensitive periods of the day and requires other measures to minimize noise impacts associated with construction activities (i.e., mufflers for construction equipment, informational signage).

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Program NO-1.i	**Regulate Noise Sources.** Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities. As a condition of permit approval for projects generating significant construction noise impacts during the construction phase, construction management for any project shall develop a construction noise reduction plan and designate a disturbance coordinator at the construction site to implement the provisions of the plan.	**Consistent.** In accordance with the Marin County Code, Mitigation Measure NOI-1, included in this EIR, limits the hours of construction and requires that a "disturbance coordinator" be designated to respond to any local complaints about construction noise.
Public Facilities and Services		
Policy PFS-3.3	**Reduce Storm Water Volume.** Implement appropriate upstream water-saving technologies to reduce storm water volumes and increase percolation. Increase permeable surfaces and encourage on-site percolation to reduce storm water volume and potential overflow of wastewater treatment facilities.	**Consistent.** The proposed project would not create or contribute runoff that would exceed the capacity of existing or planned stormwater drainage systems. As discussed in Section 4.6, the proposed project would not increase the amount of stormwater runoff relative to existing conditions; therefore, the proposed project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. Mitigation Measure BIO-1, which requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) during project construction and inclusion of water quality protection measures as part of the project design, would reduce potential impacts associated with stormwater runoff to a less-than-significant level.
Policy PFS-4.1	**Reduce the Solid Waste Stream.** Promote the highest and best use of discarded materials through redesign, reuse, composting, and shared producer responsibility. Emphasize a closed-loop system of production and consumption.	**Consistent.** Long-term operation of the roadway would not generate solid waste. During project construction, solid waste would be generated including construction materials, trench spoils, and general refuse, and these wastes would need to be disposed of in local or regional facilities. Waste generated from construction would include: nonhazardous metal waste, non-hazardous non-metal waste (concrete rubble, organic waste [vegetation], boxes and crates, refuse from construction workers), and trenching spoils (rubble, soil, broken asphalt). Non-hazardous metal and non-metal waste would be hauled to local disposal centers for recycling or taken to landfills. Trenching and excavation spoils would be reused to the maximum extent possible. Therefore, the proposed project would be consistent with Policy PFS-4.1 to reduce the solid waste stream.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Program PFS-4.b	**Divert Construction Waste.** Continue to implement the construction and demolition recycling waste ordinance to divert construction waste from landfills.	**Consistent.** See above.
Public Safety		
Policy PS-3.2	**Safe Public Structures**. Protect public health and safety through appropriate siting and rehabilitation of public facilities.	**Consistent.** The proposed project would rehabilitate an existing roadway to improve traffic flow and relieve congestion, as well as enhance safety for vehicles, pedestrians and bicyclists. Therefore, the proposed project would be consistent with Policy PS-3.2 to provide safe public structures.
Program PS-3.k	**Ensure Seismic Design Regulations.** Continue to implement County ordinances to ensure that new construction meets California Building Code seismic design requirements, provides seismic shut-off devices, and anchors liquid petroleum gas tanks. Require geological assessment (for example, Soils Investigation and Geologic/Geotechnical reports) for grading permits to determine the effects of seismic ground shaking on proposed grading and associated new construction.	**Consistent.** As described in Section 4.5, Geology and Soils, a site-specific geotechnical investigation was conducted for the proposed project that explored and evaluated geologic and geotechnical soil conditions of the project area, including a field investigation and soil borings, in order to provide geotechnical conclusions and recommendations for the design of the project, including seismic design requirements. The proposed project would be consistent with Program PS-3.k.
Goal PS-4	**Decreased Exposure to Hazardous Materials.** Reduce the risks to human and environmental health from hazardous materials.	**Consistent.** The proposed project does not involve the routine use, transport, or storage of hazardous materials. However, hazardous materials would be used at the project site during project construction and ground disturbing activities associated with project construction could result in the release of hazardous materials. Implementation of the mitigation measures included in this EIR, which require the preparation and implementation of a Construction Risk Management Plan (CRMP), would reduce potential impacts related to hazardous and the risk of human, animal, and environmental exposure.
Policy PS-4.1	**Regulate and Reduce Hazardous Material Use.** Control the use and storage of hazardous materials to minimize their presence in, and potential dangers to, the community and environment.	**Consistent.** As described above, project construction could result in the release of hazardous materials. Implementation of the mitigation measures included in this EIR would ensure that construction materials are stored away from sensitive resources including Corte Madera Creek. The preparation and implementation of a HSPRMP will be the mechanism for protecting the community and environment from the effects of hazardous materials.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Program PS-4.d	**Prepare for Hazardous Materials Incidents.** Plan for response to an emergency involving a major release of hazardous materials (see Policy PS-3.1; also see the Environmental Justice Section of the Socioeconomic Element).	**Consistent.** Mitigation Measure HAZ-1 requires the preparation and implementation of a CRMP to address the possibility of encountering contamination or subsurface hazards, in addition to emergency response procedures in the event of a hazardous materials release.
Community Participation		
Goal CP-1	**Broad and Diverse Participation.** Incorporate all segments of the community in County planning efforts and local decision making.	**Consistent.** Prior to initiating the EIR process, the County conducted an extensive outreach process integrating community members, local agencies, and utility companies that included four community meeting workshops, two walking tours, and several meetings with focus groups. In addition, the County published a Notice of Preparation and held a public scoping meeting to receive input from the community on environmental concerns prior to preparing the draft EIR. In accordance with the CEQA Guidelines, this draft EIR will be distributed for a 45-day public review period to allow all those interested in the proposed project to comment on its potential environmental impacts.
Policy CP-1.1	**Provide Access for All.** Take all feasible steps to ensure that everyone interested in participating in community forums has the materials necessary to contribute to informed decisions, as well as convenient access to meeting venues.	**Consistent.** See above.
Program CP-1.a	**Inform and Engage the Community.** Employ a variety of techniques to inform and promote two-way communication with a broad and diverse range of the community about County decision-making meetings, including print, information technology, post, radio, and television.	**Consistent.** See above.
Historical and Archaeological Resources		
Goal HAR-1	**Historical Resource Protection.** Identify and protect archaeological and historical resources as major contributors to quality of life and community vitality in Marin.	**Consistent.** Ground disturbing activities associated with project construction could impact archaeological and historical resources within the project area. Implementation of Mitigation Measure CULT-1, described in this EIR, will ensure that archaeological and historical resources are protected.
Policy HAR-1.1	**Preserve Historical Resources.** Identify archaeological and historical resource sites.	**Consistent.** As described in Section 4.4, Cultural Resources, historical and archaeological resources have been identified within and adjacent to the project site and may be impacted by project construction. Implementation of the mitigation measures identified in this EIR will protect archaeological and historical resources should they be encountered during project construction.

Table 4.9.A: Relationship of Project to Marin Countywide Plan

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Policy HAR-1.3	**Avoid Impacts to Historical Resources.** Ensure that human activity avoids damaging cultural resources.	**Consistent.** As described in Section 4.4, Cultural Resources, historical and archaeological resources have been identified within and adjacent to the project site and may be impacted by project construction. Implementation of the mitigation measures identified in this EIR would avoid impacts to historic resources.
Program HAR-1.d	**Require Archaeological Surveys for New Development.** Require archaeological surveys conducted on site by a State-qualified and FIGR recommended archaeologist for new development proposed in areas identified as potential resource locations on the County sensitivity map (see Program HAR-1.a).	**Consistent.** As described in Section 4.4, Cultural Resources, LSA conducted an archaeological survey of the project site. The results of this survey have been detailed in this EIR.
Program HAR-1.e	**Require Permanent Protection**. Require development at an archaeological site to, where feasible, avoid the resource and provide permanently deeded open space that incorporates the resource.	**Consistent.** Mitigation Measure CULT-1 included in this EIR, requires monitoring of all project ground disturbance within 500 feet of the Sir Francis Drake Boulevard / La Cuesta Drive intersection that is 18 inches below surface. In addition, any resource that would be affected by project activities shall be evaluated to determine if the deposit qualifies as a historical or archaeological resource under CEQA. If the deposit *does* so qualify, then the County shall develop and implement, in consultation with the project archaeologist, a plan to mitigate the impact.
Program HAR-1.f	**Involve Appropriate Authorities**. Refer development proposals on or near cultural resource sites to the California Archaeological Inventory, the Northwest Regional Office of the California Historical Resources Information System, and/or Native American representatives, as appropriate.	**Consistent.** As part of preparing this EIR, a cultural resource records search of the project site was conducted on June 9, 2017, at the Northwest Information Center (NWIC) of the California Historical Resources Information System to identify previous cultural resources studies and site records for the project site and vicinity. A review of the Sacred Lands File, on file at the Native American Heritage Commission (NAHC) in West Sacramento, was completed on June 12, 2017, for the project site and vicinity. Pursuant to Assembly Bill 52 (AB 52), the County notified the Federated Indians of Graton Rancheria (FIGR) via a letter dated December 13, 2016, of their opportunity to consult regarding potential impacts from the project to tribal cultural resources. No response to these letters was received by the County.

Marin County Unincorporated Area Bicycle and Pedestrian Master Plan. The Marin County Unincorporated Area Bicycle and Pedestrian Master Plan (Master Plan) includes recommendations to create an integrated, complete network of bicycle paths, lanes, routes and pedestrian improvements in Marin County. The goal of the Master Plan is to increase the number of people walking or bicycling for utilitarian trips, such as for work, school, shopping or recreation. The Master Plan identifies both short- and long-term projects such as new bikeways or walkways as well as education, outreach and other programs.

The Master Plan identifies the entire project alignment as the Sir Francis Drake Bikeway Study Area and designates this stretch of SFDB as a proposed bike lane. As described in the Master Plan, the high traffic volumes and varying geometry of the SFDB corridor make it too complex to establish one facility type along its entire length. The Sir Francis Drake Bikeway Study will determine appropriate improvements.

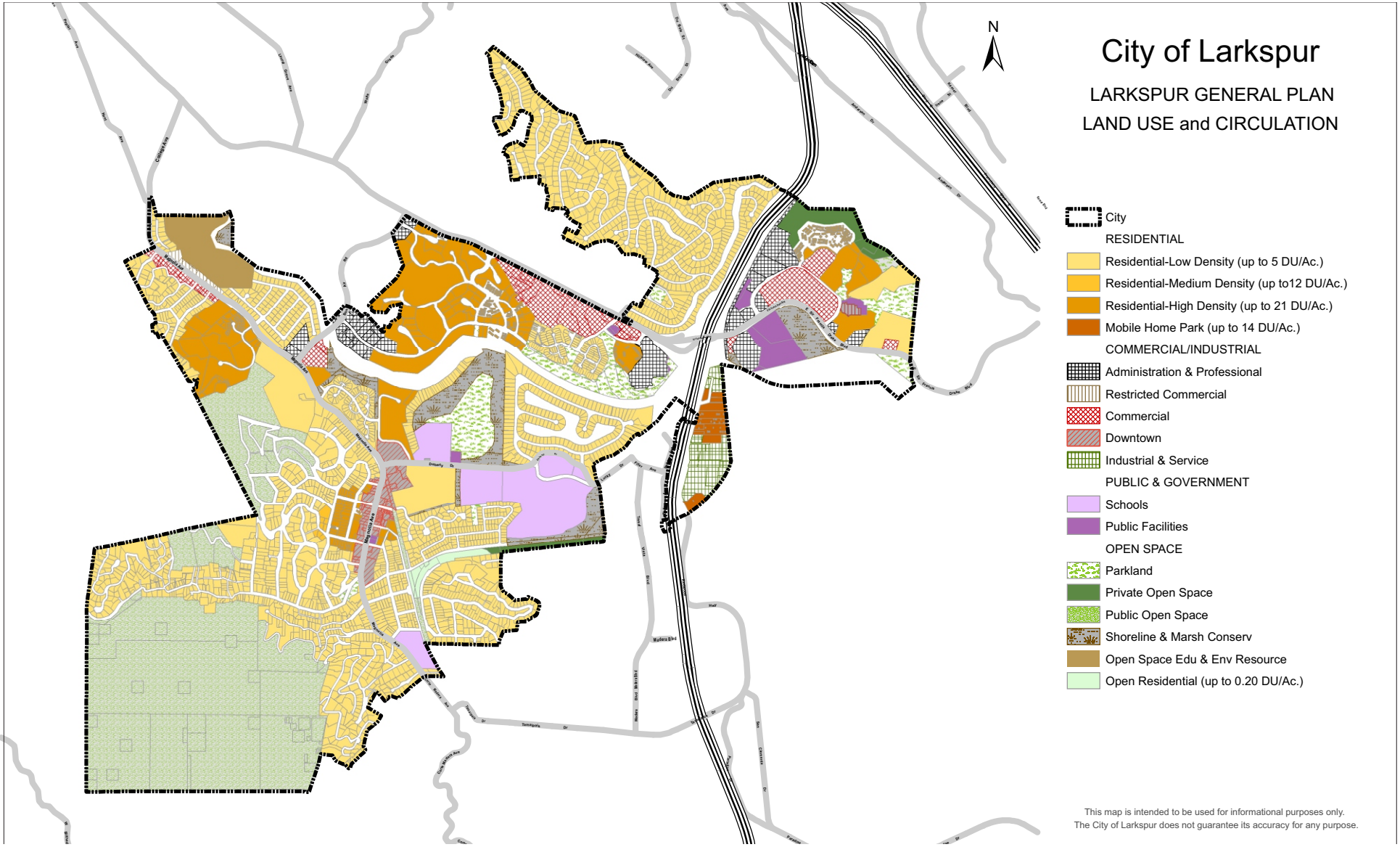
The College of Marin Bicycle Access Improvements Project would include improvements in the unincorporated areas surrounding the College of Marin. Proposed improvements would include:

- Extend the bike lanes on College Avenue from the Corte Madera Creek Path to SFDB
- Establish a Kent Avenue bicycle route from the Ross border to College Avenue/Magnolia, employing Shared Roadway Bicycle Markings to designate safe riding areas outside the “door zone” alongside parallel parking.
- Install crosswalk improvements at the pathway crossing at College Avenue, including striping a high visibility crosswalk and flashing in-pavement crosswalk warning lights.
- Conduct a pathway study to determine feasibility of widening the Corte Madera Creek pathway between College Avenue and Lagunitas Road in Ross as a partnership between the County of Marin and the Town of Ross to address this narrow segment in both jurisdictions.
- Improve bicycle and pedestrian access and facilities at bus stops serving the college.

4.9.2.2 City of Larkspur Planning Documents

1990 Larkspur General Plan. The City of Larkspur General Plan provides the development policies for the City and its Sphere of Influence. The General Plan is the official policy guide for governmental decision-makers, within and outside of Larkspur and is a references for Larkspur citizens, who want to know what is planned for their city and to property owners, who want to know the potential use of their land.

As described above, the proposed project site consists of roadway right-of-way, with no land use designation. Adjacent land use designations within the City of Larkspur city limits of the project corridor include: Residential – Low Density (up to 5 DU/acre), Residential – High Density (up to 21 DU/acre), Administration and Professional Offices, Commercial, and Public Facilities (see Figure 4.9-2). The General Plan also contains the following policies most relevant to the proposed project.



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SOURCE: City of Larkspur 1990

Sir Francis Drake Boulevard Rehabilitation Project

City of Larkspur General Plan Land Use Designations

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Land Use Element

Goal 18: Cooperate with other jurisdictions in solving regional problems, in protecting environmental resources, and in providing public services.

Policy x: Continue to participate with other communities in regional and countywide planning studies.

Policy y: Work with other communities to develop common policies for protection and enhancement of natural resources such as Corte Madera Creek.

Community Character Element

Goal 2: Maintain Larkspur's livable and attractive environment.

Policy b: Preserve the desirable features of the built environment as well as the remaining natural environment - trees, marshes, creeks, hillsides - as components of Larkspur's community character and identity.

Policy d: Visually integrate the various sections of the community.

Goal 3: Assure the survival of Larkspur's special "sense of place."

Policy h: Encourage broad-based community interest in and support of preservation activities.

Policy i: Identify significant archaeological, historic, and natural resources representing all of the ethnic, cultural, and economic groups that have lived and worked in Larkspur.

Policy j: Safeguard and maintain significant historic, archaeological, and natural resources.

Goal 4: Promote a greater awareness of and sensitivity toward Larkspur's archaeological heritage.

Policy l: The City shall cooperate with the CAI toward the protection and preservation of artifacts in those areas already identified as containing archaeological remains.

Policy m: The City shall cooperate with the California Archaeological Inventory (CAI) in the development of information which will allow the prediction of additional sites likely to contain archaeological remains.

Policy n: The City shall take all possible precautions to insure that no action by the City results in the loss of the irreplaceable archaeological record present in the City's planning jurisdiction, and shall work with the County toward that end.

Circulation Element

Goal 1: Regard quality of life in Larkspur as more important than mobility of traffic.

Goal 2: Provide safe and efficient local-serving transportation facilities and services for the movement of people and goods.

Goal 3: Ameliorate the impact of traffic on Larkspur's quality of life.

Policy a: Develop a coordinated system of roads, bike paths, foot paths, public transit, and Transportation Demand Management (TDM) programs.

Policy b: Remove hazards from the traffic system.

Policy c: Except for singly-developed single-family homes and vacant properties, proposed changes in existing use shall not add traffic to SFDB.

Policy d: Wherever possible, maintain standards for acceptable traffic Levels of Service under peak periods. Acceptable Level of Service (LOS) shall be defined for signalized intersections at the D level using planning procedures designed in Transportation Research Circular 212 or successor.

Policy e: Conform to standard traffic engineering practices where practical.

Policy f: Encourage through traffic to use designated major arterials.

Policy g: Do not permit thoroughfares to divide the city.

Policy h: Design circulation facilities that minimize disruption of neighborhoods and communities.

Policy j: Prepare a program of traffic capacity improvements to ease traffic congestion.

Policy m: SFDB shall not be widened to allow additional through-traffic lanes.

Action Program [2]: Actively cooperate with the County of Marin to seek workable capacity improvements to SFDB that are not disruptive to the community.

Action Program [3]: Maintain and improve the existing median strip landscaping on SFDB.

Action Program [5]: Perform the following specific capacity and safety related improvements:

- *Signalize the intersection of SFDB with Larkspur Landing Circle (east).*
- *Remove the railroad trestle from the roadway of SFDB, east of Highway 101.*
- *Make capacity enhancing improvements on east SFDB between Larkspur Landing Circle (west) and Highway 101.*

- *Add a southbound-to-eastbound left-turn lane on Eliseo Drive at the intersection with SFDB.*
- *Signalize the intersection of Redwood Highway and Industrial way, and add a northbound left-turn lane.*
- *Signalize the intersection of SFDB with El Portal Drive.*

Goal 5: Encourage attractive alternatives to the use of single-occupant automobiles.

Goal 7: Aim for lower levels of peak hour automobile traffic.

Goal 9: Reduce transportation-related sources of air pollution.

Goal 10: Create better ties between Larkspur, neighboring communities and the region.

Policy x: Work with regional agencies to ensure that Larkspur's needs and concerns are recognized.

Action Program [13]: Encourage and cooperate with the appropriate jurisdictions to accomplish the following specific improvements:

- *Signalize the SFDB/Andersen Drive intersection.*
- *Signalize the intersection of Redwood Avenue/Corte Madera Avenue.*
- *Realign Nellen Avenue to connect directly to Tamal Vista Boulevard. Close the existing connection from Nellen Avenue to Fifer Avenue.*

Action Program [14]: Actively cooperate with Caltrans, County of Marin, City of Corte Madera, and City of San Rafael to find workable capacity and safety improvements to the Greenbrae and Lucky Drive interchanges with Highway 101.

Goal 12: Reduce the need for long distance and/or frequent shopping travel by private automobile.

Policy z: Encourage means of travel to and between retail areas other than by private automobile.

Policy aa: Create stronger links between retail areas.

Goal 14: Reduce the number and severity of transportation-related accidents.

Goal 15: Provide good fire access and traffic safety in neighborhoods.

Policy ae: Place a higher priority on safety as opposed to efficient traffic flow and speed.

Policy af: Identify streets that create a problem for fire or traffic safety.

Action Program [17]: Install stop signs, pedestrian cross walks, and other safety-related improvements, as warranted.

Goal 16: Circulation improvements should not adversely affect the environment.

Policy ag: Ensure that transportation facilities do not impinge upon irreplaceable resources (such as Corte Madera Creek, the Bay and its shoreline, important open space lands, and recreational facilities).

Policy ah: Minimize air, water, and noise pollution due to transportation.

Policy ai: Consider seismic and geotechnical factors in the planning, location, design and construction of new transportation facilities.

Action Program [21]: Landscape new circulation facilities in harmony with the environment and safety considerations.

<u>Bicycle and Pedestrian Trails and Paths Element</u>

Goal 1: Make it easier to travel around Larkspur by non-motorized transportation modes.

Policy b: Fill gaps in the existing path system.

Action Program [2]: Implement the Bicycle/Pedestrian Circulation Plan.

Goal 2: Provide safe bicycle and pedestrian routes for all users, to schools, shopping and business areas, recreation facilities, open space preserves, and other communities, and associated amenities.

Policy e: Locate and design pedestrian and bike trails separate from streets and automobile traffic wherever possible. Designate on-street bike lanes where off-road paths are not possible.

Goal 4: Reduce the need for long distance and/or frequent shopping travel by private automobile.

Policy k: Encourage means of travel to and between retail areas other than by private automobile.

Goal 6: Provide paths that encourage broad public use.

Policy o: When developing trails and paths, consider the access needs of a variety of users, including school-age children, the elderly, and the handicapped.

Goal 7: Reduce the number and severity of transportation-related accidents.

Policy r: Provide bicyclists and pedestrians with safe facilities for circulation.

Policy s: Place higher priority on safety as opposed to efficient traffic flow and speed.

Policy t: Identify streets that create a safety problem for pedestrians and bicyclists.

City of Larkspur Zoning Ordinance. The City of Larkspur Zoning Map[171], combined with Title 18, Zoning, of the Municipal Code[172], define zoning classifications within the City. The purpose of Title 18 is to establish such regulations as are deemed necessary in order to encourage the most appropriate use of land; to conserve and stabilize the value of property; to provide adequate open spaces for light and air; to prevent undue concentration of population; to lessen congestion on streets; to facilitate adequate provisions for community utilities such as transportation, water, sewerage, schools, parks, and other public requirements; to promote and protect the public health, safety, peace, morals, comfort, convenience, general welfare and natural beauty; to protect the character and economic stability of residential, commercial, industrial, and other areas within the City and to assure the orderly and beneficial development of such areas as parts of a well-coordinated community, all in accord with a comprehensive plan.

The project site is shown as a transportation corridor on the Larkspur Zoning Map, and is not within any zoning district. Zoning designations adjacent to the project corridor include: R-1 (Residential First), R-3 (Residential Third), C-2 (Commercial), AP (Administrative Professional), and PD (Planned Development).

City of Larkspur Bicycle and Pedestrian Master Plan. In 2004, the City of Larkspur completed a Bicycle and Pedestrian Master Plan to identify its existing network of bicycle facilities and multi-use paths. The City of Larkspur Bicycle and Pedestrian Master Plan was developed to lay the framework for future facilities, and develop policies that will work toward making bicycling and walking an integral part of transportation and daily life in Larkspur. The purpose of the plan was to coordinate and guide the provision of all bicycle and pedestrian related plans, programs, and projects in Larkspur. The City of Larkspur Bicycle and Pedestrian Master Plan shows a proposed Class III bike path along SFDB at the eastern end of the project alignment to Eliseo Drive that extends north along Eliseo Drive, Via Hermosa and Via La Cumbre to the City of Larkspur city limits.

DRAFT - City of Larkspur Bicycle and Pedestrian Master Plan. In 2014, the City of Larkspur initiated an update to the City of Larkspur Bicycle and Pedestrian Master Plan. The Draft City of Larkspur Bicycle and Pedestrian Master Plan update builds upon the previous plan, adopted in 2004 and updated in 2006. The Draft City of Larkspur Bicycle and Master Plan update shows an existing Class II bike lane on SFDB at the eastern end of the project alignment just west of Highway 101. This Class II bike lane connects to a proposed Class III bike paths on Eliseo Drive to the north and through the Bon Air Shopping Center to the south. The plan also shows existing Class I bikeway (or multi-use

[171] Larkspur, City of. Larkspur Zoning Districts. Available online at: http://www.ci.larkspur.ca.us/DocumentCenter/Home/View/471, (accessed 6 June 2017).

[172] Larkspur, City of, 2010. Larkspur Municipal Code, Title 18 Zoning. Current through March 2017. Available online at: http://www.codepublishing.com/CA/Larkspur/?Larkspur18/Larkspur1816.html. (accessed 7 June 2017).

path) along Wolfe Grade south of SFDB connecting to a proposed Class III bike path on Wolfe Grade north of SFDB. SFDB is shown as a "Special Study" area, consistent with the 2008 Marin County Unincorporated Area Bicycle and Pedestrian Plan.

4.9.2.3 Kentfield/Greenbrae Community Plan

The study area for the Kentfield/Greenbrae Community Plan, adopted in 1987, includes the unincorporated area of Marin County bordered by the Town of Ross and the cities of San Rafael, Larkspur, and Mill Valley. The vast majority of land in the study area is zoned single-family residential and is used for housing. The intent of the Kentfield/Greenbrae Community Plan is to protect those qualities of the community that enhance it as a predominantly single-family residential area and to limit multi-family and commercial development to the historic Kentfield area. Goals and policies relevant to the proposed project include:

Goal 1: Achieve high quality in the natural and built environment through a balanced system of land use, transportation and open space.

Goal 4: Encourage land use modifications, circulation improvements, and community organizations which further a sense of neighborhood and community identity.

Goal 7: Limit changes in land use and circulation to those which do not: 1) generate substantial additional traffic; 2) conflict with and congest intra-community travel; and 3) endanger pedestrian and bicycle movement.

Goal 8: Improve safety and convenience of circulation by means other than increasing the capacity of arterial streets.

Goal 9: Encourage inter-jurisdictional cooperation and comprehensive environmental review.

Circulation policies and recommendations applicable to the proposed project identified in the Kentfield/Greenbrae Community Plan include:

Policy 1: The Kentfield/Greenbrae community desires a circulation system which allows safe movement and ready mobility for non-motorized traffic and for motor vehicles while preserving the community character.

Policy 2: Inadequate circulation leads to peak period congestion and delay in affecting both local and through traffic. Though undesirable, these conditions are preferable to major, irreversible changes such as further widening of major arterials. Land, scenic resources, and community character are our most important assets; changes that diminish these assets are usually irreversible and should be avoided.

Policy 4: Minor roadway improvements which improve safety and traffic flow are encouraged provided they do not: 1) result in major additions to arterial roadway capacity, and 2) encroach upon parking, transit, and pedestrian/bicycle movement. Such improvements should support the plan's goals of managed growth and high quality in the natural and built environment.

Recommendation 4: Existing sidewalks improved to County standards on Wolfe Grade and future pedestrian path should be developed to link the county with San Rafael.

Recommendation 6: There should be no major additions of capacity to the area's arterials beyond those already approved. Specifically, SFDB should not be widened to four lanes west of College Avenue.

4.9.3 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on land use if it would:

- Physically divide an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to land use if it would:

- Call for land uses that would convert prime agricultural land to non-agricultural use or impair the productivity of prime agricultural land.
- Conflict with County land use goals or policies.
- Call for land uses that would conflict with existing or proposed uses at the periphery of the project area or with other local land use plans.
- Result in conversion of open space into urban or suburban scale development.
- Conflict with local zoning.
- Result in nuisance impacts as a result of incompatible land uses.

4.9.4 Impacts and Mitigation Measures

The following discussion analyzes impacts related to land use that could result from project implementation. All impacts would be less than significant.

(1) Divide an Established Community. The physical division of an established community typically refers to the construction of a physical feature (such as an interstate highway or railroad tracks) or removal of a means of access (such as a local road or bridge) that would impair mobility with an existing community, or between a community and outlying areas. The proposed project

would not create a barrier that would divide an established community; it would enhance the stability of the existing roadway and improve vehicular circulation through this portion of the SFDB corridor. In addition, the proposed project would provide safety enhancements for bicyclists, pedestrians, and transit. As such, the project would not physically divide an established community. This impact would be less than significant.

(2) Conflict with Applicable Plans, Policies and Regulations. The proposed project is located within Marin County right-of-way and is therefore, under the jurisdiction of Marin County. However, other jurisdictions/communities along the project corridor include the City of Larkspur and the community of Kentfield/Greenbrae. Each of these entities has plans and policies that are relevant to the proposed project. All of the plans and policies that are relevant to the proposed project are described in Section 4.10.2 Regulatory Setting. The proposed project is consistent with all the plans and policies as discussed below.

Roadway Improvements. The proposed project is consistent with the Marin Countywide Plan and other applicable planning documents. The policies contained in these regulatory documents seek to enhance the transportation network while preserving open space, visual resources, quality of life, and the environment. The proposed project implements a number of goals within the plans including: safety improvements that benefit bicyclists and pedestrians, roadway rehabilitation to ensure the safe and efficient movement of the people and goods, and preservation of existing land uses. The proposed project involves the rehabilitation of an existing roadway to improve traffic flow and reduce vehicle congestion. Although a third eastbound travel lane would be provided from El Portal Drive to Highway 101, additional traffic capacity would not be provided as a result of implementing the proposed project. The additional lane would accommodate existing traffic volumes in order to help relieve congestion during the peak periods; it is not intended to expand the capacity of the existing roadway to accommodate increased vehicle travel. In conjunction with other proposed intersection modifications, implementation of the proposed project would reduce travel times for vehicle traffic along the project corridor. The proposed project would also improve safety for bicyclists and pedestrians by relocating the transit stop near Kentfield Fire Station, reducing crossing distances, modifying intersections, and widening sidewalks.

Waterline Replacement. The proposed water line replacement would not change existing land use within the project corridor. The pipeline would be replaced within the existing right-of-way; therefore, additional right-of-way and/or access easements would not be required. The proposed waterline replacement would not result in the conversion of adjacent land uses or conflict with applicable Marin County land use designations or zoning standards.

The proposed project could impact visual resources, cultural resources, biological resources, and water resources in conflict with the planning goals and policies included in the Natural Resources and Agriculture Element of the Marin Countywide Plan. Impacts to these resources are not land use impacts by nature and are discussed in other sections of this document. County planning documents call for the mitigation of environmental impacts. As discussed in other sections of this document, all of the impacts associated with the proposed project can be mitigated by implementing the measures described in this EIR.

(3) Conflict with a Habitat Conservation Plan or Natural Community Conservation Plan. The project site is not subject to the provisions of a Habitat Conservation Plan or Natural Community Conservation Plan (HCP/NCCP). Therefore, the project would not conflict with such a plan.

(4) Convert Agricultural Land. The project site is mapped as "Urban and Built-Up Land" by the California Department of Conservation Farmland Mapping and Monitoring Program (FMM) (California Department of Conservation, Division of Land Resource Protection 2011). Urban and Built-Up Land is occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. Common examples include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment and water control structures.

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. The project site is not zoned for agricultural use and is not under a Williamson Act contract.

No Farmland is mapped on or near the project site and no portion of the project site is zoned for agricultural use or under Williamson Act contract. The proposed project would be constructed within public right-of-way that is not currently in agricultural use. Therefore, the proposed project would not affect agricultural resources, operations or contracts.

(5) Conflict with Surrounding Land Uses. The proposed project would rehabilitate the existing roadway to enhance safety for pedestrians and bicyclists, improve vehicular traffic flow and reduce congestion during the peak periods and would upgrade approximately 8,000 feet of existing waterline to enhance system reliability. It would not change the capacity or character of the road in a manner that would be incompatible with the surrounding land use, which as shown in Figure 4.10-1a and 4.10-1b consists of urban development, including residential and commercial land uses and public facilities.

(6) Convert Open Space. As described above, the proposed project is surrounded by urban development. No open space uses are located within the project corridor. Several community parks, Niven Park, Greenbrae School Park, and Creekside Park, are located in the project vicinity. However, project activities would rehabilitate and make improvements to the existing roadway within the County right-of-way and would not convert nearby public open space lands to other uses.

(7) Conflict with Local Zoning. The proposed project would not change the zoning of the project site or the surrounding area and, therefore, would not create a zoning conflict.

(8) Create Nuisance Impacts. The project would not create new land uses that would result in nuisance impacts; it would rehabilitate a two-mile segment of SFDB to enhance safety for pedestrians and bicyclists, improve vehicular traffic flow and reduce congestion during the peak periods and upgrade approximately 8,000 feet of existing waterline to enhance system reliability. During construction activities, disruption of traffic flows and other temporary effects on adjoining land uses, including noise impacts, air impacts, service disruptions and lane closures could occur. These impacts are discussed within the appropriate topical sections of this document.

4.10 NOISE

This section describes existing noise conditions in the vicinity of the site, describes criteria for determining the significance of noise impacts, and estimates the likely noise that would result from the proposed project. Where appropriate, mitigation measures are recommended to reduce project-related noise impacts to less-than-significant levels.

4.10.1 Setting

The setting section begins with an introduction to several key concepts and terms that are used in evaluating noise. This section also includes a description of current noise sources that affect the project site and the noise conditions that are experienced in the project site vicinity.

4.10.1.1 Background

This section provides background information on the evaluation of noise impacts including the characteristics of sound, measurement of sound, physiological effects of noise, and the regulatory framework for this analysis.

Characteristics of Sound. Noise is usually defined as unwanted sound and consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect our ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves, combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be measured precisely with instruments. The project analysis defines the noise environment of the project area in terms of sound intensity and the project's effect on adjacent sensitive land uses.

Measurement of Sound. Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units (e.g., inches or pounds), decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) are 10 times more intense than 1 dB; 20 dB are 100 times more intense than 1 dB; and 30 dB are 1,000 times more intense than 1 dB. Thirty decibels (30 dB) represent 1,000 times as much acoustic energy as 1 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately 6 dBA for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations), the sound decreases 3 dBA for each doubling of distance in a hard-site environment, and the sound decreases 4.5 dBA for each doubling of distance in a relatively flat environment with absorptive vegetation.

There are many ways to rate noise for various time periods, including an appropriate rating of ambient noise affecting humans to account for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time varying noise over a sample period. However, the predominant rating scales for communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day-night average level (L_{dn}) based on dBA. CNEL is the time varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as evening hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable.

Other noise rating scales that are important when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half of the time the noise level exceeds this level, and half of the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3.0 dB or greater since this level has been found to be the lowest audible change perceptible to humans in outdoor environments. The second category, potentially audible, refers to a change in the noise level between 1.0 and 3.0 dB, only noticeable in laboratory environments. The last category includes changes in noise levels of less than 1.0 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Physiological Effects of Noise. Physical damage to human hearing begins at prolonged exposure (typically more than 8 hours, as defined by the Occupational Safety and Health Administration [OSHA]) to noise levels higher than 85 dBA. Exposure to high noise levels affects our entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions (thereby affecting blood pressure and functions of the heart and the nervous system). In comparison, extended

periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dB, a tickling sensation occurs in the human ear, even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dB, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160 to 165 dB will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying less developed areas.

Table 4.10.A lists "Definitions of Acoustical Terms," and Table 4.10.B displays "Common Sound Levels and Their Noise Sources."

Table 4.10.A: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of level that denotes the ratio between two quantities proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels equaled or exceeded by a fluctuating sound level for 1 percent, 10 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.

Source: Harris, Cyril M., *Handbook of Acoustical Measurements and Noise Control*, 1991.

Table 4.10.B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a few feet away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	Reference Level
Near Freeway Auto Traffic	70	Moderately Loud	
Average Office	60	Moderate	1/2 as loud
Suburban Street	55	Moderate	
Light Traffic; Soft Radio Music in Apartment	50	Quiet	1/4 as loud
Large Transformer	45	Quiet	
Average Residence Without Stereo Playing	40	Faint	1/8 as loud
Soft Whisper	30	Faint	
Rustling Leaves	20	Very Faint	
Human Breathing	10	Very Faint	Threshold of Hearing

Source: Compiled by LSA Associates, Inc., 2015.

Characteristics of Groundborne Vibration. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. As the vibration propagates from the foundation throughout the remainder of the building, the vibration of floors and walls may be perceptible from the rattling of windows or a rumbling noise. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. When assessing annoyance from groundborne noise, vibration is typically expressed as root mean square (rms) velocity in units of decibels of 1 micro-inch per second.

To distinguish vibration levels from noise levels, the unit is written as "VdB." Human perception to vibration starts at levels as low as 67 VdB and sometimes lower. Annoyance due to vibration in residential settings starts at approximately 70 VdB. Groundborne vibrations are almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects associated with the shaking of the building, the motion does not provoke the same adverse human reaction.

Common sources of groundborne vibration include trains and construction activities such as blasting, pile driving and operating heavy earthmoving equipment. Typical vibration source levels from construction equipment are shown in Table 4.11.C. Although the table gives one level for each piece of equipment, it should be noted that there is a considerable variation in reported ground vibration levels from construction activities. The data provides a reasonable estimate for a wide range of soil conditions. In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. For buildings considered of particular historical significance or

that are particularly fragile structures, the damage threshold is approximately 96 VdB; the damage threshold for other structures is 100 VdB.[173]

4.10.1.2 Overview of the Existing Noise Environment

In Marin County, vehicle traffic is the primary source of noise, with the highest noise levels occurring along major roadways.[174] Other significant local noise sources include aircraft, trains, mining activities, and construction. Estimates of future noise along major roadways can be projected based on estimates of future traffic, while changes in noise due to other sources may depend on a range of site-specific factors.

Existing Sensitive Land Uses. Sensitive receptors include residences, schools, hospitals, churches and similar uses that are sensitive to noise. Project construction and operation could adversely affect nearby noise-sensitive land uses. Existing sensitive land uses within the project area include single-family family residential homes located adjacent to the project alignment. Other sensitive receptors within the project area include multi-family housing and Bacich Elementary School, Kent Middle School, Marin Catholic High School, College of Marin, and Marin General Hospital.

Existing Roadway Noise Levels. Motor vehicles with their distinctive noise characteristics are the primary source of noise in Marin County. The amount of noise varies according to many factors, such as volume of traffic, vehicle mix (percentage of cars and trucks), average traffic speed, and distance from the observer. Major contributing roadway noise sources in Marin County include Highway 101 and Highway 37, and local roadways including Atherton Road, St. Vincent's Road, Petaluma Point Reyes Road, Novato Boulevard, and Sir Francis Drake Boulevard, and other arterial and collector roadways throughout the County.

Existing highway and roadway traffic noise levels in the project vicinity were assessed using the guidelines provided in the Federal Highway Administration (FHWA) highway traffic noise prediction model (FHWA RD-77-108). This approach uses a typical vehicle mix for urban/suburban areas in California and requires parameters, including traffic volumes, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the day-night average level (L_{dn}) values. Existing traffic noise contours along modeled roadway segments are shown in Table 4.10.C.

[173] Harris, C.M., 1998. *Handbook of Acoustical Measurements and Noise Control.*
[174] Marin, County of. 2007. *Marin Countywide Plan.* November 6.

Table 4.10.C: Existing Traffic Noise Levels

Roadway Segment	Average Daily Trips	Centerline to 70 dBA L_{dn} (feet)	Centerline to 65 dBA L_{dn} (feet)	Centerline to 60 dBA L_{dn} (feet)	L_{dn} (dBA) 50 Feet From Centerline of Outermost Lane
Sir Francis Drake Boulevard - west of Elm Avenue	18,500	< 50	76	160	65.8
Sir Francis Drake Boulevard - Elm Ave to Fire Station Driveway/College Avenue	18,700	< 50	77	162	65.8
Sir Francis Drake Boulevard - Fire Station Driveway/College Avenue to Terrace Avenue/Ski Shop Driveway	18,700	< 50	63	128	63.8
Sir Francis Drake Boulevard - Terrace Avenue/Ski Shop Driveway to Ash Avenue	23,300	< 50	72	147	64.8
Sir Francis Drake Boulevard - Ash Avenue to Laurel Grove Avenue	13,300	< 50	< 50	103	62.3
Sir Francis Drake Boulevard - Laurel Grove Avenue to Wolfe Grade	24,500	< 50	74	152	65.0
Sir Francis Drake Boulevard - Wolfe Grade to Manor Road	28,500	< 50	81	168	65.6
Sir Francis Drake Boulevard - Manor Road to Bon Air Road	28,500	< 50	81	168	65.6
Sir Francis Drake Boulevard - Bon Air Road to El Portal Drive	29,900	62	128	274	69.3
Sir Francis Drake Boulevard - El Portal Drive to La Cuesta Drive/Shopping Center Driveway	33,700	68	139	296	69.4
Sir Francis Drake Boulevard - La Cuesta Drive/Shopping Center Driveway to Eliseo Drive/Barry Way	32,300	66	135	288	69.2
Sir Francis Drake Boulevard - east of Eliseo Drive/Barry Way	38,500	74	152	324	70.0

Source: Parisi Transportation Consulting, 2017; compiled by LSA Associates, 2017
Note: Traffic noise levels within 50 feet of roadway centerline can be calculated manually with site specific information.

Existing Airport Noise Levels. Aircraft overflights contribute to the ambient noise levels in Marin County. Marin County has two general aviation airports: the Gnoss Field County Airport, north of Novato, and the San Rafael Airport, in northern San Rafael. Gnoss Field County Airport is located approximately 15 miles north of the proposed project and San Rafael Airport is located approximately 7 miles north of the proposed project. Activity levels and associated noise generation for Gnoss Field have not changed substantially since 1986.[175] Activity levels for San Rafael Airport, regulated by a conditional use permit, and associated noise generation have not increased since 2003 and are not projected to increase in the future.

Aircraft overflights associated with the Oakland International Airport and San Francisco International Airport are also audible from the project site. Oakland International Airport is located

[175] Ibid.

approximately 33 miles southeast of the proposed project and San Francisco International Airport is located approximately 37 miles south of the proposed project.

Existing Rail Noise Levels. The Northwestern Pacific Railroad runs through the northeastern portion of the County. However, current railroad use does not generate noise in excess of annual average 60 L_{dn} beyond the rail line's right-of-way.[176] In August 2017, the Sonoma-Marin Area Rail Transit District (SMART) began operation of a commuter rail project along the Northwestern Pacific Railroad right-of-way between Santa Rosa and Downtown San Rafael, and will eventually extend north to Cloverdale and south to the Larkspur Ferry terminal, a distance of about 71 miles. Ultimately five stations will be in Marin County and trains will run every 30 minutes during the peak period with approximately 12 to 16 trains per day. Rolling stock will be a diesel multiple unit, which are quieter than standard diesel locomotives. The SMART train has been measured to generate a maximum passby sound level of 76-80 dBA at a distance of 50 feet from the passby. This level is similar to the noise level generated by a medium truck passing by at a similar speed.

4.10.2 Regulatory Framework

The federal, State, and local framework for noise standards is outlined below. Marin County has established standards in the Countywide Plan and in the Municipal Code for land use projects that could potentially expose sensitive receptors to excessive noise levels. The City of Larkspur has also established noise level standards in the General Plan and Municipal Code.

4.10.2.1 U.S. Environmental Protection Agency

In 1972 Congress enacted the Noise Control Act. This act authorized the (U.S. EPA) to publish descriptive data on the effects of noise and establish levels of sound *requisite to protect the public welfare with an adequate margin of safety.* These levels are separated into health (hearing loss levels) and welfare (annoyance levels), as shown in Table 4.10.D. The U.S. EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

Table 4.10.D: Summary of U.S. EPA Noise Levels

Effect	Level	Area
Hearing loss	$L_{eq}(24) \leq 70$ dB	All areas.
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq}(24) \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq 45$ dB	Indoor residential areas.
	$L_{eq}(24) \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Source: U.S. Environmental Protection Agency, 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. March.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to an $L_{eq(24)}$ of 70 dBA. The "(24)" signifies an L_{eq} duration of 24 hours. The U.S. EPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet in the

[176] Ibid.

outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

The noise effects associated with an outdoor L_{dn} of 55 dBA are summarized in Table 4.10.E. At 55 dBA L_{dn}, 95 percent sentence clarity (intelligibility) may be expected at 11 feet, and no community reaction. However, 1 percent of the population may complain about noise at this level and 17 percent may indicate annoyance.

4.10.2.2 State of California

The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the *State Noise Insulation Standard*, it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

Table 4.10.E: Summary of Human Effects in Areas Exposed to 55 dBA L_{dn}

Type of Effects	Magnitude of Effect
Speech – Indoors	100 percent sentence intelligibility (average) with a 5 dB margin of safety.
Speech – Outdoors	100 percent sentence intelligibility (average) at 1.4 feet. 99 percent sentence intelligibility (average) at 3.2 feet. 95 percent sentence intelligibility (average) at 11.5 feet.
Average Community Reaction	None evident; 7 dB below level of significant complaints and threats of legal action and at least 16 dB below "vigorous action."
Complaints	1 percent dependent on attitude and other non-level related factors.
Annoyance	17 percent dependent on attitude and other non-level related factors.
Attitude Towards Area	Noise essentially the least important of various factors.

Source: U.S. Environmental Protection Agency, 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. March.

4.10.2.3 Marin County

County of Marin Countywide Plan. The County of Marin addresses noise in the Built Environment Element of the Marin Countywide Plan.[177] The Countywide Plan includes goals, policies, and implementing programs that work to ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life. Policies and implementing programs relevant to this project include the following:

- **Policy NO-1.2: Minimize Transportation Noise.** Ensure that transportation activities do not generate noise beyond acceptable levels, including in open space, wilderness, wildlife habitat, and wetland areas.

- **Policy NO-1.3: Regulate Noise Generating Activities.** Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.

  - **Implementing Program NO-1.c: Require Project-Specific Noise Mitigation.** Require all development to mitigate its noise impacts where the project would

    - raise the L_{dn} by more than 5 dBA;

    - raise the L_{dn} by more than 3 dBA and exceed the Normally Acceptable standard; or

    - raise the L_{dn} by more than 3 dBA and the Normally Acceptable standard is already exceeded.

  - **Implementing Program NO-1.d: Set Additional Limits for Housing.** Amend the Development Code to require the following maximum noise levels for all new residential units:

    - Exterior — 60 dBA L_{dn}

    - Interior — 45 dBA L_{dn}

  - **Implementing Program NO-1.e: Coordinate with Public Agencies.** Work with local, regional, State, and federal agencies to address existing and potential noise impacts, such as vehicle tire sound production and aircraft overflight, and to determine appropriate mitigation measures necessary to meet Acceptable Noise Levels.

  - **Implementing Program NO-1.i: Regulate Noise Sources.** Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities. As a condition of permit approval for projects generating significant construction noise impacts during the construction phase, construction management for any project shall develop a construction noise reduction plan and designate a disturbance coordinator at the construction site to implement the provisions of the plan.

[177] Ibid.

- **Implementing Program NO-1.m: Limit Sound Walls.** Encourage Caltrans to consider utilizing alternatives to sound walls along Highway 101, such as landscaped berms, sloped walls, and other best technology. Amend the Development Code to include standards for construction of non-sound- wall noise mitigation structures. Consider the impacts of reflected noise resulting from sound wall installation.

County of Marin Municipal Code. The County of Marin also addresses noise in Chapter 6.70 of the County of Marin Municipal Code.[178]

6.076.030 – Enumerated Noises. The following acts, among others, are declared to be loud, disturbing and unnecessary noises in violation of this chapter, but this enumeration shall not be deemed to be exclusive:

5. Construction Activities and Related Noise.

    a. Hours for construction activities and other work undertaken in connection with building, plumbing, electrical, and other permits issued by the community development agency shall be limited to the following:

        i. Monday through Friday: 7:00 a.m. to 6:00 p.m.

        ii. Saturday: 9:00 a.m. to 5:00 p.m.

        iii. Prohibited on Sundays and Holidays (New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.)

    b. Loud noise-generating construction-related equipment (e.g., backhoes, generators, jackhammers) can be maintained, operated, or serviced at a construction site for permits administered by the community development agency from eight a.m. to five p.m. Monday through Friday only.

    c. Special exceptions to these limitations may occur for:

        i. Emergency work as defined in Section 22.130.030 of this code provided written notice is given to the community development director within forty-eight hours of commencing work;

        ii. Construction projects of city, county, state, other public agency, or other public utility;

        iii. When written permission of the community development director has been obtained, for showing of sufficient cause;

[178] Marin, County of. 2017. *Marin County, California Municipal Code.* March 14.

iv. Minor jobs (e.g., painting, hand sanding, sweeping) with minimal/no noise impacts on surrounding properties;

v. Modifications required by the review authority as a discretionary permit condition of approval.

4.10.2.4 City of Larkspur

City of Larkspur General Plan. The City of Larkspur addresses noise in the Health and Safety Element of the Larkspur General Plan.[179] The General Plan includes goals, policies, and action programs that aim to reduce the adverse effects of noise, reduce noise levels in areas where the existing noise exceeds "normally acceptable" levels to compatible noise levels and prevent the escalation of noise levels in areas where noise-sensitive uses exist. Policies and action programs relevant to this project include the following:

- **Action Program 38:** Maintain the following standards for noise levels in new residential developments.
  - Indoor noise levels should not exceed 45 dBA.
  - Outdoor noise levels should not exceed 55 dBA.

- **Policy X:** Control unnecessary, excessive, and annoying noises within the City, where not preempted by federal or State control.
- **Policy Y:** Enforce applicable federal and State laws.
  - **Action Program 42:** Enforce the provisions of the California Motor Vehicle Code pertaining to vehicle noise emission.
- **Policy AA:** Analyze in detail the potential noise impacts of any actions the City may take that could significantly alter noise levels in the community.
  - **Action Program 44:** Review all public works projects for potential noise impact.
  - **Action Program 45**: Consider noise emission when purchasing vehicles, construction equipment, etc. This consideration shall be balanced against the required performance and cost.

City of Larkspur Municipal Code. The City of Larkspur also addresses noise in Chapter 9.54 of the City of Larkspur Municipal Code.[180]

[179] Larkspur, City of. 1990. *Larkspur 1990 General Plan*.
[180] Larkspur, City of. 2017. *Larkspur Municipal Code.* March 1.

9.54.040 – Exterior Noise Limits. Unless otherwise specifically indicated in this chapter, it shall be unlawful for any person at any location within the City to create, or cause to be created, any noise that exceeds the applicable exterior noise limit as described below:

Table 4.10.F: Exterior Noise Limits

Receiving Land Use	Time	Noise Level Not to be Exceeded For More than 30 Minutes per hour (dBA)
Residential	7:00 a.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	40
Commercial	Any time	60

Source: City of Larkspur, 2017.

9.54.060 – Exceptions. The following activities shall be exempted from the provisions of this chapter:

E. Noise sources exceeding the prescribed standards that are associated with construction, repair, remodeling, demolition, or paving of any real property, including noise from vehicles and equipment associated with these activities, occurring during the following time periods: Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m. and Saturday between the hours of 9:00 a.m. and 5:00 p.m. Construction activity is not allowed on Sundays and holidays.

1. This exemption is granted on the condition that all powered construction equipment is equipped with intake and exhaust mufflers recommended by the manufacturers thereof; pavement breakers and jackhammers shall also be equipped with acoustical attenuating shields or shrouds recommended by the manufacturers thereof.

2. In lieu of or in the absence of manufacturers' recommendations, the Public Works Director and/or the Planning and Building Director shall have the authority to prescribe such means of accomplishing maximum noise attenuation as deemed necessary in the public interest, considering the available technology and economic feasibility.

4. The Director of Public Works may grant special exceptions to these limitations for work performed on public facilities and/or within the public right-of-way for:

b. Emergency work as defined in LMC 9.54.010(E), provided written notice is given to the Director of Public Works within forty-eight hours of commencing work.

c. Construction projects of City, County, State, other public agency, or other public utility.

d. When written permission of the Public Works Director has been obtained for showing of sufficient cause, for reasons other than those listed above.

4.10.3 Significance Criteria

A project would have a significant noise effect if it would substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of the community in which it is located. The applicable noise standards governing the project site are the State's noise criteria, the Built Environment Element of the Marin Countywide Plan, the Healthy and Safety Element of the City of Larkspur's General Plan and applicable sections of the Marin County and City of Larkspur Municipal Codes. For the purposes of this project, a noise impact is considered significant if the project would result in:

- The exposure of people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies.
- Result in a 5 dBA permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For projects within an area covered by an airport land use plan or within two miles of a public airport or public use airport when such an airport land use plan has not been adopted, or within the vicinity of a private airstrip, expose people residing or working within the project site to excessive aircraft noise levels.
- Expose people to or generate excessive groundborne vibration or groundborne noise levels.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant noise impact if:

- The project would generate noise that would conflict with countywide noise standards or other state or local noise standards.
- The project proposes land uses that substantially increase noise levels in areas of sensitive receptors.
- The land use proposed by the project would be incompatible with the baseline noise levels.

4.10.4 Impacts and Mitigation Measures

The following discussion analyzes impacts related to noise that could result from project implementation. All impacts would be less than significant with mitigation incorporated.

(1) Temporary or Periodic Increase in Ambient Noise Levels. The following section addresses possible noise level increases in the project vicinity resulting from implementation of the proposed project. A potential source of increased noise level includes construction-related noise.

Construction. The proposed project is located adjacent to single-family family residences. In addition, other sensitive receptors within the project area include multi-family housing and Bacich Elementary School, Kent Middle School, Marin Catholic High School, College of Marin, and Marin General Hospital. Project construction would result in short-term noise impacts on these adjacent land uses. Maximum construction noise would be short term, generally intermittent depending on the construction phase, and variable depending on receiver distance from the active construction zone. The duration of noise impacts generally would be from one day to several days depending on the phase of construction. The entire construction duration is expected to occur for 24 months. The level and types of noise impacts that would occur during construction are described below.

Impact NOI-1: Construction period activities could create significant short-term noise impacts on noise sensitive properties adjacent to the project. (S)

Short-term noise impacts would occur during grading and site preparation activities. Table 4.10.G lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor, obtained from the FHWA Roadway Construction Noise Model. Construction-related short-term noise levels would be higher than existing ambient noise levels currently in the project area but would no longer occur once construction of the project is completed.

Table 4.10.G: Noise Emission Reference Levels and Usage Factors

Equipment Description	Acoustical Usage Factor[1]	Predicted L_{max} at 50 feet (dBA, slow)[2]	Actual Measured L_{max} at 50 feet (dBA, slow)[3]
All Other Equipment > 5 HP	50	85	N/A[4]
Auger Drill Rig	20	85	84
Backhoe	40	80	78
Bar Bender	20	80	N/A
Blasting	N/A	94	N/A
Boring Jack Power Unit	50	80	83
Chain Saw	20	85	84
Clam Shovel (dropping)	20	93	87
Compactor (ground)	20	80	83
Compressor (air)	40	80	78
Concrete Batch Plant	15	83	N/A
Concrete Mixer Truck	40	85	79
Concrete Pump Truck	20	82	81
Concrete Saw	20	90	90
Crane	16	85	81
Dozer	40	85	82
Drill Rig Truck	20	84	79
Drum Mixer	50	80	80
Dump Truck	40	84	76
Excavator	40	85	81
Flat Bed Truck	40	84	74
Front-End Loader	40	80	79
Generator	50	82	81
Generator (< 25 kVA, VMS Signs)	50	70	73
Gradall	40	85	83

Table 4.10.G: Noise Emission Reference Levels and Usage Factors

Equipment Description	Acoustical Usage Factor[1]	Predicted L_{max} at 50 feet (dBA, slow)[2]	Actual Measured L_{max} at 50 feet (dBA, slow)[3]
Grader	40	85	N/A
Grapple (on backhoe)	40	85	87
Horizontal Boring Hydraulic Jack	25	80	82
Hydra Break Ram	10	90	N/A
Impact Pile Driver	20	95	101
Jackhammer	20	85	89
Man Lift	20	85	75
Mounted Impact Hammer (hoe ram)	20	90	90
Pavement Scarifier	20	85	90
Paver	50	85	77
Pickup Truck	40	55	75
Pneumatic Tools	50	85	85
Pumps	50	77	81
Refrigerator Unit	100	82	73
Rivet Buster/Chipping Gun	20	85	79
Rock Drill	20	85	81
Roller	20	85	80
Sand Blasting (single nozzle)	20	85	96
Scraper	40	85	84
Sheers (on backhoe)	40	85	96
Slurry Plant	100	78	78
Slurry Trench Machine	50	82	80
Soil Mix Drill Rig	50	80	N/A
Tractor	40	84	N/A
Vacuum Excavator (Vac-Truck)	40	85	85
Vacuum Street Sweeper	10	80	82
Ventilation Fan	100	85	79
Vibrating Hopper	50	85	87
Vibratory Concrete Mixer	20	80	80
Vibratory Pile Driver	20	95	101
Warning Horn	5	85	83
Welder/Torch	40	73	74

Source: FHWA Highway Construction Noise Handbook, Table 9.1 (FHWA 2006).
Note: Noise levels reported in this table are rounded to the nearest whole number.

[1] Usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.

[2] Maximum noise levels were developed based on Specification (Spec.) 721.560 from the Central Artery/Tunnel (CA/T) program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.

[3] The maximum noise level was developed based on the average noise level measured for each piece of equipment during the CA/T program in Boston, Massachusetts.

[4] Since the maximum noise level based on the average noise level measured for this piece of equipment was not available, the maximum noise level developed based on Spec 721.560 would be used.

dBA = A-weighted decibels
ft = feet
HP = horsepower
kVA = kilovolt-amperes
L_{max} = maximum instantaneous noise level
N/A = not applicable
RCNM = Roadway Construction Noise Model
VMS = variable message sign

Two types of short-term noise impacts could occur during construction of the proposed project. The first type involves construction crew commutes and the transport of construction equipment and

materials to the site for the proposed project, which would incrementally increase noise levels on roads leading to the site. As shown in Table 4.10.G, there would be a relatively high single-event noise exposure potential at a maximum level of 84 dBA L_{max} with trucks passing at 50 feet.

The second type of short-term noise impact is related to noise generated during excavation, grading, and construction on the project site. Construction is performed in discrete steps, or phases, each with its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase.

Table 4.10.G lists maximum noise levels recommended for noise impact assessments for typical construction equipment, based on a distance of 50 feet between the equipment and a noise receptor. Typical maximum noise levels range up to 86 dBA L_{max} at 50 feet during the noisiest construction phases. The site preparation phase, including excavation and grading of the site, tends to generate the highest noise levels because earthmoving machinery is the noisiest construction equipment. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

The proposed project is located adjacent to single-family residential uses. Project construction would result in short-term noise impacts on these adjacent uses. The closest single-family residences are located approximately 40 feet from the existing roadway, and construction of the project would result in the residences being within 30 feet of where construction is occurring. At 30 feet, there would be an increase of 4 dBA from the reduced distance compared to the noise level measured at 50 feet from the active construction area. Therefore, the closest off-site residences may be subject to short-term construction noise exceeding 90 dBA L_{max} when construction is occurring at the project site boundary.

As identified in the Project Description, for specific construction operations, DPW may conduct work during nighttime hours. Nighttime work hours would be between 8:00 p.m. and 5:00 a.m. Sunday through Thursday. Construction noise is permitted by Marin County and the City of Larkspur when activities occur between the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday and between the hours of 9:00 a.m. and 5:00 p.m. on Saturdays. Construction activity is not allowed on Sundays and holidays. Construction activities occurring outside of these hours is permitted for City and County construction projects and when written permission of the Marin County Community Development Director and City of Larkspur Public Works Director has been obtained for showing of sufficient cause.

As discussed above, construction noise would result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. Implementation of the following mitigation measure for project construction would reduce potential construction period noise impacts for the indicated sensitive receptors to less-than-significant levels.

Mitigation Measure NOI-1: The project contractor shall implement the following measures during construction of the project:

- Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site.
- Locate equipment staging in areas that would create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction.
- Ensure that all general construction related activities are restricted to 7:00 a.m. and 6:00 p.m. on weekdays, and between 9:00 a.m. and 5:00 p.m. on Saturdays. No construction shall be permitted on Sundays or holidays. To conduct work outside of these hours, the project sponsor shall obtain written permission from the Marin County Community Development Director or City of Larkspur Public Works Director demonstrating sufficient cause.
- Temporary noise control blanket barriers shall be installed in a manner to shield adjacent land uses.
- Designate a "disturbance coordinator" at Marin County who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem. (LTS)

Significance After Implementation. Implementation of the above mitigation measure would reduce construction impacts to a less-than-significant level.

(2) Substantial Permanent Increase in Ambient Noise Levels. The following section addresses possible noise level increases in the project vicinity resulting from implementation of the proposed project. A potential source of increased noise level includes traffic-related noise.

Traffic Noise Levels. The proposed project is located in an area where the primary source of noise is traffic along Sir Francis Drake Boulevard and Highway 101. The proposed project would rehabilitate an existing roadway, including roadway repaving, intersection geometry and striping modifications, installation of pedestrian, bicyclist, and Americans with Disabilities Act (ADA) improvements, installation of drainage improvements, and replacement and installation of water supply mains.

To assess traffic noise impacts, the traffic noise levels along major roadway segments within the project vicinity were projected using FHWA modeling to predict traffic noise level conditions along Sir Francis Drake Boulevard (Appendix G). FWHA modeling was based on existing traffic conditions as documented in the Traffic and Circulation Section. FWHA modeling results are summarized in

Table 4.10.H. The proposed project would not result in an increase in vehicular trips on Sir Francis Drake Boulevard. The table includes projected traffic noise levels as measured at 50 feet from the centerline of the outermost traveled lane along the modeled roadway segments. The model does not account for existing sound walls or terrain features that could reduce traffic noise levels at adjacent land uses, but rather assumes a worst-case direct line-of-sight over hard surface to the modeled traffic noise sources.

As shown in Table 4.10.H, under existing conditions, noise levels on Sir Francis Drake Boulevard range from approximately 62.3 to 70.0 dBA L_{dn}, which exceeds Marin County's normally acceptable noise level of 60 dBA L_{dn} for residential uses and the City of Larkspur's normally acceptable noise level of 55 dbA L_{dn} for residential uses. Future year 2020 and 2040 noise level conditions would continue to exceed normally acceptable noise levels; however, these increased future noise levels would occur with or without implementation of the proposed project.

Implementation of the proposed project would have the potential to move the roadway approximately 10 feet closer to the existing adjacent single-family residences, from approximately 40 feet to 30 feet; however, as discussed, the proposed project would not result in an increase in vehicular trips on Sir Francis Drake Boulevard. Moving the roadway closer to the existing residences would increase traffic noise levels by approximately 2.5 dBA when compared to existing conditions. This noise level increase is less than the 3 dBA increase considered to be perceptible by the human ear in an outdoor environment and less than the County's criteria for noise level increases of 5 dBA or more.

In addition, a characteristic of sound is that a doubling of a noise source is required in order to result in a perceptible (3 dBA or greater) increase in the resulting noise level. The project would not generate trips and therefore would not result in a doubling of traffic volumes along any roadway segment in the project vicinity and would not result in a perceptible increase in traffic noise levels at receptors in the project vicinity. Therefore, project-related traffic would not be expected to result in a perceptible increase in traffic noise levels along roadways in the site vicinity. Therefore, project-related traffic would result in a less-than-significant impact on off-site sensitive land uses.

Table 4.10.H: Summary of Traffic Noise Levels

Roadway Segment	Existing Conditions		2020 Conditions			2040 Conditions		
	ADT	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	ADT	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	Increase over 2020 Conditions (dBA)	ADT	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	Increase over 2020 Conditions (dBA)
Sir Francis Drake Boulevard - west of Elm Avenue	18,500	65.8	18,900	65.9	0.1	20,900	66.3	0.5
Sir Francis Drake Boulevard - Elm Ave to Fire Station Driveway/College Avenue	18,700	65.8	19,000	65.9	0.1	21,100	66.4	0.6
Sir Francis Drake Boulevard - Fire Station Driveway/College Avenue to Terrace Avenue/Ski Shop Driveway	18,700	63.8	23,700	64.8	1.0	26,300	65.3	1.5
Sir Francis Drake Boulevard - Terrace Avenue/Ski Shop Driveway to Ash Avenue	23,300	64.8	23,800	64.8	0.0	26,400	65.3	0.5
Sir Francis Drake Boulevard - Ash Avenue to Laurel Grove Avenue	13,300	62.3	23,600	64.8	2.5	26,200	65.3	3.0
Sir Francis Drake Boulevard - Laurel Grove Avenue to Wolfe Grade	24,500	65.0	25,000	65.1	0.1	27,700	65.5	0.5
Sir Francis Drake Boulevard - Wolfe Grade to Manor Road	28,500	65.6	32,400	66.2	0.6	35,900	66.6	1.0
Sir Francis Drake Boulevard - Manor Road to Bon Air Road	28,500	65.6	29,100	65.7	0.1	32,200	66.2	0.6
Sir Francis Drake Boulevard - Bon Air Road to El Portal Drive	29,900	69.3	30,500	69.4	0.1	33,800	69.8	0.5
Sir Francis Drake Boulevard - El Portal Drive to La Cuesta Drive/Shopping Center Driveway	33,700	69.4	34,300	69.5	0.1	38,000	69.9	0.5
Sir Francis Drake Boulevard - La Cuesta Drive/Shopping Center Driveway to Eliseo Drive/Barry Way	32,300	69.2	33,000	69.3	0.1	36,500	69.7	0.5
Sir Francis Drake Boulevard - east of Eliseo Drive/Barry Way	38,500	70.0	37,700	69.9	0.1	41,700	70.3	0.3

Notes: ADT = Average Daily Traffic
Source: Parisi Transportation Consulting, 2017 LSA Associates, 2017.

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(3) Generate Excessive Groundborne Vibration. Common sources of groundborne vibration and noise include trains and construction activities such as blasting, pile driving and operating heavy earthmoving equipment. No permanent noise sources that would expose persons to excessive groundborne vibration or noise levels would be located at the project site. The proposed project would not require the use of pile driving during construction and operation activities associated with the proposed project would not result in excessive groundborne vibration or groundborne noise levels. Therefore, implementation of the proposed project would not expose persons within or around the project site to excessive groundborne vibration or noise and this impact would be less than significant.

(4) Excessive Airport Noise. As noted in the existing conditions discussion above, aircraft noise in the County of Marin is primarily related to aircraft operations at the Gnoss Field County Airport, north of Novato, and the San Rafael Airport, in northern San Rafael. Gnoss Field County Airport is located approximately 15 miles north of the proposed project and San Rafael Airport is located approximately 7 miles north of the proposed project. However, no portion of the project site is within 65 dBA CNEL noise contours of these airports nor does any portion of the project site lie within 2 miles of any private airfield or heliport.

Aircraft overflights associated with the Oakland International Airport and San Francisco International Airport are also audible from the project site. Oakland International Airport is located approximately 33 miles southeast of the proposed project and San Francisco International Airport is located approximately 37 miles south of the proposed project. Although noise from aircraft activity is occasionally audible in the project vicinity, due to the distance of the project site from surrounding airports, no portion of the project site lies within the 65 dBA CNEL noise contours of any public airport. Therefore, the proposed project would not result in the exposure of sensitive receptors to excessive noise levels from aircraft noise sources.

4.11 PUBLIC SERVICES AND RECREATION

This section analyzes the proposed project's potential impacts on the following public services: fire protection, police services, schools, and parks and recreation. Potential impacts to public services and recreation that could result from the proposed project are identified, and mitigation measures are recommended, as appropriate.

4.11.1 Setting

The setting section describes the current service locations, capacities, and expansion possibilities, as well as laws, codes, and regulations relevant to public services and recreation.

4.11.1.1 Fire Protection and Emergency Medical Services

Fire protection and emergency medical services for the project site would be provided by the Larkspur Fire Department and the Ross Fire Department. The project site is also located within the Kentfield Fire Protection District.

Larkspur Fire Department. The Larkspur Fire Department maintains two fire stations in the City of Larkspur. The Larkspur Fire Station 16, located at 15 Barry Way in Greenbrae, is the closest fire station to the project site, located just south of SFDB at the eastern end of the project site. Larkspur Fire Station 16 would respond to a fire on the eastern portion of the project site. The equipment at the Larkspur Fire Station 16 includes: two Type 1 engines designed for structural protection (one engine is reserve), and one Type 3 engine designed for wildland fires. Existing personnel at the Larkspur Fire Station 16 includes 1 captain, 1 engineer/firefighter, and 1 firefighter/paramedic.[181] The Larkspur Fire Department's response time goal is 5 minutes or less for 90 percent of all emergency code 3 (lights and siren)calls. The estimated time to the project site is within the Larkspur Fire Department's response goal.[182]

Ross Valley Fire Department. The Ross Valley Fire Department maintains four fire stations that serve the Town of Fairfax, City of San Anselmo, and communities of Ross and Sleepy Hollow.[183] The Ross Valley Fire Department Station 18, located at 33 SFDB, is the closest fire station to the project site, located approximately 0.2 mile to the west of the project site. Ross Valley Fire Station 18 would respond to a fire at the western end of the project site. Equipment at Fire Station 18 includes one Type I fire engine, a reserve Type 1 fire engine which can be staffed by off-duty personnel as needed, one transport ambulance, one utility pickup, and a mobile air unit. Existing personnel at Station 18 includes a fire captain and an engineer/firefighter. Station 18 became part of the Ross Valley Fire Department in 2012. The Ross Valley Fire Department's response time goal is four to six minutes.[184] The estimated response time to the project site is approximately 30 seconds.

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181 City of Larkspur. 2017. Fire Stations & Apparatus. Available online at: http://www.ci.larkspur.ca.us/240/Fire-Stations-Apparatus (last accessed June 7, 2017).

182 Scott Shurtz, Fire Chief Larkspur Fire Department. Written correspondence June 30, 2017.

183 Ross Valley Fire Department. 2017. Fire Station 18- Ross. Available online at: http://www.rossvalleyfire.org/about/fire-stations (last accessed June 8, 2017).

184 Daniel Mahoney, Acting Fire Chief, Ross Valley Fire Department. Written correspondence June 27, 2017.

Kentfield Fire Protection District. The Kentfield Fire Protection District is a member of the California Inter-County Mutual-Aid Plan and the Marin County Automatic and Mutual-Aid Plan which covers emergencies and disasters such as fires, floods, and earthquakes. Additionally, the fire district is a member of the Ross Valley Paramedic Authority. The Kentfield Fire Protection District maintains one station in the project area, Kentfield Fire Protection District Station 17, located at 1004 SFDB. The jurisdiction of the Kentfield Fire Protection District extends along the northern side of SFDB west of Eliseo Drive and the northern and southern side of SFDB from Bon Air Road to just east of Lagunitas Road, west of the project site. The equipment at the Kentfield Fire Protection District Station 17 includes: three Type I pumper engines, 1 ladder truck, and 2 utility vehicles. Existing personnel at the District include twelve full-time professional firefighters and six volunteer/seasonal firefighters. Four firefighters are staffed daily at the station.[185] The Kentfield Fire Protection District's response time goal is less than 3 minutes to most locations within the district. The estimated response time to the project site can vary due to the location of the work zone.[186] The fire district is available for response 24 hours a day, 365 days a year.

4.11.1.2 Police Services

The project site is served by the Town of Ross Police Department, Marin County Sheriff's Department, and the Central Marin Police Authority (CMPA). The College of Marin, located along the project alignment also has a police force.

Ross Police Department. The Ross Police Department provides 24-hour law enforcement services to the Town of Ross in which the western end of the project site is located. Existing personnel include 1 chief of police, 2 police sergeants, and 5 police officers.[187]

Marin County Sheriff's Department. The Marin County Sheriff's Office (MCSO) provides police protection in the project area. The Kentfield Substation is the closest station to the project site and serves the surrounding communities. [188] The Sheriff's Office also works closely with other local city police departments as part of a Mutual Aid Agreement to call in resources to a major event. Response times to the project site vary from a few minutes to up to twenty minutes, depending on the location of the responding patrol car, time of day, and traffic.

Central Marin Police Authority. In 2013, the Twin Cities Police Authority and the San Anselmo Police Department successfully merged and became the CMPA. The CMPA provides police protection services to the communities of Corte Madera, Larkspur, San Anselmo, and portions of Greenbrae, comprising approximately 35,000 residents. [189] The headquarters are located at 250 Doherty Drive in

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185 Kentfield Fire Protection District. 2017. Kentfield Fire Protection District. Available online at: http://www.kentfieldfire.org/administration/about (last accessed June 7, 2017).

186 Pomi, Mark, Fire Chief, Kentfield Fire Protection District. Written correspondence July 11, 2017.

187 Town of Ross. 2017. Police. Available online at: http://www.townofross.org/police (last accessed June 8, 2017).

188 Marin County Sheriff's Office. 2017. Patrol Division. Available online at: http://www.marinsheriff.org/about-us/field-service-bureau/patrol-division (last accessed June 8, 2017).

189 Central Marin Police Authority. 2017. About CMPA. Available online at: http://www.centralmarinpolice.org/129/About-CMPA (last accessed June 8, 2017).

Larkspur, approximately 0.7 mile south of the project site. As of 2014, CMPA has approximately 56 employees, with 43 sworn officers. [190]

4.11.1.3 Schools

Three school districts provide public education services in the project area: 1) Ross School District; 2) Kentfield School District; and 3) Tamalpais School District. The College of Marin is also located within the project corridor.

Ross School District. The Ross School District (RSD) includes a single school, serving approximately 400 students in kindergarten through eighth grade in the community of Ross. The western end of the project site is located within the boundary of the RSD. **Kentfield School District.** The Kentfield School District (KSD) is located in Kentfield and is comprised of two sites schools: Bacich Elementary School and Kent Middle School. Approximately 1,230 students are enrolled in the KSD. [192]Students in the eastern portion of the project area would attend these two schools.

Tamalpais Union High School District. The Tamalpais Union High School District (TUHSD) extends from the Golden Gate Bridge to the San Rafael city limits. The TUHSD operates three comprehensive high schools (serving grades 9 through 12) and two alternative programs. Over 4,600 students are served by TUHSD. [193]Students in the project area would attend Redwood High School.

College of Marin. The College of Marin is a community college with campuses in Kentfield and Novato. The College of Marin has a total enrollment of 13,091 with 11,555 students in Kentfield and 2,446 at the Indian Valley campus in Novato.

4.11.1.4 Parks and Recreation

County parks and City of Larkspur parks provide a variety of active recreation amenities, including playing fields, pools, golf courses, tennis and volleyball courts, skate parks, and playgrounds. Marin County has approximately 932 acres of public parkland. The Quimby Act sets of standard of 3 to 5 acres of parkland per 1,000 residents. However, several planning areas of the County including Novato, Las Gallinas, Upper and Lower Ross Valley, and West Marin Planning Areas fall short of the Quimby standard.[194] The City of Larkspur has 51.3 acres of public parkland with a parkland-to-population ratio of 4.5 acres per thousand (based on an estimated 1989 population of 11,300).[195]

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190 Central Marin Police Authority. 2017. Police Staffing Levels. Available online at: http://www.centralmarinpolice.org/130/Police-Staffing-Levels (accessed June 8, 2017).

191 Ross School District. 2017. District Profile. Available online at: https://www.rossbears.org/site/default.aspx?PageID=1106 (last accessed June 8, 2017).

192 Kentfield School District. 2017. District Overview. Available online at: http://www.kentfieldschools.org/pages/Kentfield_School_District/About_Us/Overview (last accessed June 8, 2017).

193 Tamalpais Union High School District. 2017. About Our District. Available online at: http://www.tamdistrict.org/domain/3 (last accessed June 8, 2017).

194 Marin County. 2007. Marin Countywide Plan.

195 City of Larkspur. 1990. City of Larkspur, California General Plan.

4.11.2 Regulatory Framework

Policies relevant to public services and recreation in the vicinity of the project site are drawn from the Marin Countywide Plan (2007) and the City of Larkspur General Plan (1990).

4.11.2.1 Local Plans and Policies

Marin Countywide Plan (2007). Goals and policies relevant to the provision of public services and recreation include:

Goal PFS-1 Adequate Public Facilities and Services. Provide basic public facilities to accommodate the level of development planned by cities and towns in the County.

Policy PFS-1.2 Plan Effectively to Minimize Costs. Plan public facilities in cooperation with service providers to minimize short- and long-term construction, operation, and maintenance costs.

Goal PK-1 A High-Quality Parks and Recreation System. Provide park and recreation facilities and programs to meet the various needs of all county residents.

City of Larkspur General Plan. Goals relevant to the provision of public services and recreation include:

Parks and Recreation Goal 1. Provide park facilities and recreation programs for all age groups.

Kentfield/Greenbrae Community Plan (1987). Goals relevant to the provision of public services and recreation include:

Goal 6. Maintain and preserve the community's public services.

4.11.3 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on public services and utilities if it would:

- Result in substantial adverse physical impacts associated with provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable services ratios, response times, or other performance objectives for any of the following public services:

    a) Fire protection

    b) Police protection

    c) Schools

- Increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to public services if it would:

- Require additional police/sheriff staffing, facilities, or equipment to maintain acceptable service ratios.
- Require additional fire staff, facilities, or equipment to maintain an acceptable level of service (e.g., response time, rating, other).
- Require additional school capacity or facilities.
- Require designation of additional parkland to remain in conformance with locally acceptable or adopted park standards.

4.11.4 Impacts and Mitigation Measures

The following discussion analyzes impacts related to public services and recreation that could result from project implementation and identifies mitigation measures, as appropriate. Less-than-significant impacts are discussed first followed by significant impacts.

(1) Fire Protection Services. Construction activities could increase the potential for accidental on-site fires and affect fire protection services, such as emergency vehicle response times, by interfering with traffic operations along SFDB and increasing congestion through the neighboring community.

Impact PSR-1: Construction of the proposed project could impact fire protection services by increasing emergency response time. (S)

Construction of the project could increase the potential for accidental on-site fires from such sources as the operation of construction equipment and the use of flammable construction materials. As required by Occupational Safety and Health Administration (OSHA) and Fire and Building Code requirements, the construction contractor would be required to carefully store flammable materials in appropriate containers and to immediately and completely clean up spills of flammable materials when they occur. As discussed in Section 4.9, Hydrology and Water Quality, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared and would include the implementation of best management practices for hazardous materials storage and containment of releases during construction. In addition, construction managers and personnel would be trained in emergency response and fire suppression equipment specific to construction sites. Therefore, because the proposed project would be designed to adhere to existing laws, construction of the proposed project would not have a significant impact related to fire.

Temporary lane closures and traffic rerouting during construction could incrementally increase fire response times. All lane closures and detour plans would be coordinated with fire protection and

emergency medical service providers to minimize temporary delays in emergency response times, as specified in Mitigation Measure PSR-1. In addition, temporary lane closures would implement standard City and fire department/district requirements. Further, construction activities along SFDB would undergo careful scheduling to minimize emergency response delays, including nighttime construction for specific activities, as discussed in Section 3.5.6, *Construction Phasing and Schedule.* To further reduce construction-related impacts to fire protection services, Mitigation Measure TR-1 (refer to Section 4.8, Traffic and Transportation) would be implemented, which requires the preparation of a Traffic Control Plan (TCP). The TCP would include the installation of detour signs, published notices of lane closures, and advance notice to local emergency service providers of the timing, location, and duration of construction activities. The nearby fire departments/districts (i.e., Larkspur Fire Department, Ross Valley Fire Department, and Kentfield Fire Protection District) would have the opportunity to review the TCP to ensure that an acceptable level of emergency access and transit for emergency vehicles is provided during construction. Therefore, with the implementation of Mitigation Measures PSR-1 and Mitigation Measure TR-1, construction-related impacts to fire services would be reduced to less-than-significant levels.

> Mitigation Measure PSR-1: During the design phase, Marin County's Resident Engineer shall require the contractor to coordinate all lane restrictions, roadway closures, and detour plans with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response times. Such coordination shall include the identification of alternative routes for emergency vehicles and routes across the construction area.
>
> The Traffic Control Plan shall specify that trained and equipped traffic management personnel (flaggers) will stop or divert routine traffic in order to accommodate the passing of Code 3 (lights and sirens) vehicles during construction. In addition, the fire departments/districts shall be notified for any change in traffic access during construction. (LTS)

The proposed project does not include the construction of structures that would increase population in the area or that would generate a higher demand for fire services. Currently, the Ross Valley Fire Department, Larkspur Fire Department and Kentfield Fire Protection District are responsible for providing fire protection services to the project site. Emergency vehicle response times to the project site for these fire departments/districts are consistent with the response time goals described above. The Ross Valley Fire Department, Larkspur Fire Department and Kentfield Fire Protection District have reviewed the proposed project and determined that they will be able to adequately serve the project site. Additionally, because the proposed project would not increase population in the project area, the demand for fire protection services is similar to the existing condition. The purpose of the proposed project is to reduce traffic congestion and improve operations along SFDB. Implementation of the proposed project would not generate additional vehicle trips along SFDB; would have a long-term beneficial effect to fire response times in the project area; and would not require the fire departments/districts in the area to construct or expand fire stations, hire additional staff, or purchase additional equipment. No additional mitigation is required.

Significance After Implementation. Implementation of Mitigation Measures PSR-1 and TR-1 will reduce the potential impact to fire protection services to less than significant, by ensuring that an acceptable level of access for emergency vehicles and fire protection personnel is provided during construction.

(2) Police Protection Services. Construction activities associated with the proposed project have the potential to affect police services, such as emergency vehicle response times, by interfering with traffic operations along SFDB and increasing congestion through the neighboring community.

Impact PSR-2: Construction of the proposed project could impact police protection services by increasing emergency response time. (S)

Roadway construction projects similar to the proposed project are not significant generators of crime and/or the need for police response or services. However, temporary lane closures and traffic rerouting during construction could incrementally increase police response times. All lane closures and detour plans would be coordinated with police and emergency medical service providers to minimize temporary delays in emergency response times, as specified in Mitigation Measure PSR-1. In addition, temporary lane closures would implement standard City requirements. Further, construction activities along SFDB would undergo careful scheduling to minimize emergency response delays, including nighttime construction for specific activities, as discussed in Section 3.5.6, *Construction Phasing and Schedule.* To further reduce construction-related impacts to police services, Mitigation Measure TR-1 (refer to Section 4.8, Traffic and Transportation) would be implemented, which requires the preparation of a TCP. The TCP would include the installation of detour signs, published notices of lane closures, and advance notice to local emergency service providers of the timing, location, and duration of construction activities. The nearby police departments (i.e., Central Marin Police Authority, Marin County Sheriff's and Ross Police Department) would have the opportunity to review the TCP to ensure that an acceptable level of emergency access and transit for emergency vehicles is provided during construction. Therefore, with the implementation of Mitigation Measure PSR-1 and Mitigation Measure TR-1, construction-related impacts to police services would be reduced to less-than-significant levels.

The proposed project does not include the construction of structures that would increase population in the area or that would generate a higher demand for police services. Currently, the Central Marin Police Authority, Marin County Sheriff's and Ross Police Department are responsible for providing police services to the project site. Because the improvements associated with the proposed project would improve SFDB and reduce the risk of vehicle, bicyclist, and pedestrian accidents in the project area, the number of police phone calls would marginally decrease. Therefore, the proposed project would have a long-term beneficial effect to police services by improving safety throughout the project corridor. Implementation of the proposed project would not require the police departments in the area to construct or expand stations, hire additional staff, or purchase additional equipment. No mitigation is required.

> Mitigation Measure PSR-2: Implement Mitigation Measures PSR-1 and TR-1, which require preparation and implementation of a Traffic Control Plan and coordination with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response times.

Significance After Implementation. Implementation of Mitigation Measures PSR-1 and TR-1 will reduce the potential impact to police protection services to less than significant, by ensuring that an acceptable level of access for emergency vehicles and law enforcement personnel is provided during construction.

(3) Schools. The proposed project entails rehabilitating the existing roadway and associated improvements and would not generate additional permanent employees or residents in the vicinity of the project site. Construction of residential structures is not proposed as part of the project, and as such, the project would not lead to an increase in population in the local area, or an increase in student population in the project area. The proposed project is short term in nature; therefore, it would not indirectly affect local school as a result of employees moving into the area to work on the proposed project.

However, SFDB constitutes the primary access route to schools along SFDB. Construction activities associated with implementation of the proposed project could create temporary delays for students accessing adjacent schools, including Marin Catholic, Bacich Elementary School, and College of Marin. Such impacts would be short term in duration and would be minimized with appropriate traffic management techniques, as discussed in Section 3.5.6, *Construction Phasing and Schedule.*

An existing College of Marin/Marin Transit bus stop is located along the north side of SFDB, just east of Maple Avenue. A large number of pedestrians cross SFDB from the transit stop at an uncontrolled intersection. The proposed project would relocate the existing bus stop a block to the west, to just east of Elm Avenue to provide a signalized intersection for pedestrians to safely cross SFDB. Although construction activities would temporarily disrupt transit service at Marin College and impact students getting to/from the campus, construction activities would be temporary. After construction is complete, safety at the Marin College transit stop would increase. No other school bus routes or supplement school service routes operated by Marin Transit traverse the project site. Therefore, impacts to schools are considered less than significant.

(4) Parks and Recreation. The proposed project would not result in population growth or the associated increased use of recreational facilities. No County or City of Larkspur parks are located in the project area. Overall, implementation of the proposed roadway improvements would enhance the safety of the existing roadway, thereby creating a beneficial impact for recreation users by improving access for bicyclists and pedestrians along SFDB. Therefore, impacts to parks and recreation are considered less than significant.

4.12 TRAFFIC AND CIRCULATION

This section assesses the project's potential environmental impacts on traffic and transportation as a result of the project including vehicles, transit, and non-motorized transportation. The proposed project rehabilitates pavement and reconfigures intersections to improve traffic efficiency. Therefore, the impact analysis may show benefits according to the metrics used to evaluate traffic impacts.

4.12.1 Setting

4.12.1.1 Existing Circulation Network

Roadways. US Highway 101 (Highway 101) and Interstate 580 (I-580) provide transportation between Marin County and the greater Bay Area region. Sir Francis Drake Boulevard (SFDB) is an east-west arterial roadway located in Marin County that commences just west of the Richmond-San Rafael Bridge on I-580 and ends at the Point Reyes Lighthouse. As shown in Figures 3.1 and 3.2, the section of SFDB under study is a 2-mile segment located west of Highway 101 in the County of Marin extending to Ross Terrace in the Town of Ross. SFDB serves not only the daily commute needs of upper Ross Valley and West Marin residents traveling to and from Highway 101, but also serves as the main street for the communities of Greenbrae, Kentfield, and Larkspur. Following is a description of the main roadways in the project vicinity.

- **Sir Francis Drake Boulevard** is included as an Arterial in the Marin County Congestion Management Program (CMP) between Highway 101 and State Route 1 (SR-1). In general, within the project area, two travel lanes are provided in each direction with a left turn lane at intersections from the easterly limit to College Avenue. West of College Avenue, one travel lane with a center left turn lane is provided in each direction. Figures 3.3 and 3.4 illustrate travel lane configuration and width along the corridor. Sidewalks exist on the north side of SFDB from Eliseo Drive to Ross Terrace, however some are less than five feet in width. On the south side, there are notable gaps in the sidewalk between Bon Air Road and El Portal Drive as well as along the Bon Air Shopping Center frontage. The sidewalk fronting Marin Catholic is narrow. Pedestrian crossings of SFDB are provided at signalized intersections, at Ash Avenue and Toussin Avenue, which are uncontrolled, and at a pedestrian overcrossing immediately east of Wolfe Grade.
- **Wolfe Grade** is a north south collector roadway that connects with downtown San Rafael. The extension south of Wolfe Grade serves Bacich Elementary School.
- **Bon Air Road** is a north south collector roadway that serves Marin General Hospital and destinations within the City of Larkspur.
- **College Avenue** is a north south collector roadway that serves the College of Marin, Kentfield Middle School, and the Kentfield community.

Bicycle and Pedestrian System. Caltrans defines three categories of bikeways.

- **Class I Bikeway:** Called a bike path or multi-use trail. Provides for bicycle travel on a paved right-of-way completely separated from any street or highway.

- **Class II Bikeway:** Referred to as a bike lane. Provides a striped lane for one-way travel on a street or highway.
- **Class III Bikeway:** Referred to as a bike route. Provides for shared use with pedestrian or motor vehicle traffic and is identified only by signing.

According to the 2008 Marin County Unincorporated Area Bicycle and Pedestrian Plan, a 0.3 mile section of SFDB near Highway 101 has an existing Class II facility. The remainder of the project area has no bicycle facility. Figure 5.3 in the 2008 Marin County Unincorporated Area Bicycle and Pedestrian Plan identifies a Proposed Class II bicycle route from Highway 101 through the Town of Ross.

Transit System. Public transportation within the proposed project area includes the Marin County Transit District (MCTD) and Golden Gate Transit Services. Buses use the roadway segment that is proposed to be rehabilitated in this project.

4.12.1.2 Existing Roadway Volumes and Performance

Parisi Transportation Consulting (Parisi) acquired existing traffic volumes. Table 4.12.A displays the average traffic volume at various segments along the corridor. Table 4.12.A shows that traffic volumes increase along SFDB as it approaches Highway 101. Detailed graphs of the roadway traffic volume (included in Appendix H) show that SFDB generally does not experience distinct morning and afternoon commute peaks. Instead, two-way traffic volumes remain fairly constant from about 6:00 a.m. to 6:00 p.m.

Table 4.12.A: Existing Sir Francis Drake Boulevard Traffic Volume

Segment	Average Daily Traffic
Town of Ross Limits to Elm Avenue (2 lanes)	22,500
Elm Avenue to McAllister Avenue (4 lanes)	31,500
McAllister Avenue to Bon Air Road (4 lanes)	38,000
Bon Air Road to Eliseo Drive (4 lanes)	46,500

Source: Parisi Transportation Consulting, 2017

Existing travel times were obtained from Inrix, based on real-time data from GPS locator devices. Table 4.12.B presents travel times and speeds during the peak hours. The values shown in the table represent travel times averaged over the course of each peak hour. High travel times occur within the peak hours when traffic volumes spike due to school-related travel or other surface in traffic at key points along the corridor.

Table 4.12.B: Existing Sir Francis Drake Boulevard Travel Speed

	Direction	Travel Time (min)
AM Peak Hour		
College Avenue to Bon Air Road	Eastbound	2.2
	Westbound	2.6
Bon Air Road to Highway 101	Eastbound	5.6
	Westbound	2.3
PM Peak Hour		
College Avenue to Bon Air Road	Eastbound	1.9
	Westbound	3.2
Bon Air Road to Highway 101	Eastbound	3.9
	Westbound	3.5

Source: Parisi Transportation Consulting, 2017

4.12.1.3 Existing Intersection Operations

The function of a roadway network is most often constrained by the levels of service (LOS) at intersections during the AM and PM peak commuting hours. LOS is a qualitative assessment of the quantitative effects of such factors as traffic volume, roadway geometrics, and signal phasing/timing on roadway and intersection operations. Highway Capacity Manual (HCM 2010) analyzes delay experienced by vehicles at an intersection. The resulting delay is expressed in terms of level of service (LOS), where LOS A represents free-flow activity and LOS F represents overcapacity operation. LOS is a qualitative assessment of the quantitative effects of such factors as traffic volume, roadway geometrics, speed, delay, and maneuverability on roadway and intersection operations. LOS criteria for intersections using the HCM methodology are presented below.

LOS	Description
A	No approach phase is fully utilized by traffic, and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily, and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized, and a substantial number are nearing full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally, drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.
D	This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. This level represents the most vehicles that any particular intersection approach can accommodate. Full utilization of every signal cycle is attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially, and stoppages may occur for short or long periods of time due to the congestion. In the extreme case, speed can drop to zero.

Source: Marin Countywide Plan
LOS = level of service

The relationship between LOS and delay (in seconds) at an intersection is as follows:

Level of Service	Signalized Intersection Delay per Vehicle (seconds)	Unsignalized Intersection Delay per Vehicle (seconds)
A	≤ 10.0	≤ 10.0
B	> 10.0 and ≤ 20.0	> 10.0 and ≤ 15.0
C	> 20.0 and ≤ 35.0	> 15.0 and ≤ 25.0
D	> 35.0 and ≤ 55.0	> 25.0 and ≤ 35.0
E	> 55.0 and ≤ 80.0	> 35.0 and ≤ 50.0
F	> 80.0	> 50.0

Source: Highway Capacity Manual

In addition to roadway traffic volumes, Parisi collected turning movement volumes in the AM and PM peak hours for vehicles, bicycles, and pedestrians at twelve intersections along the corridor: Elm Avenue, College Avenue, Terrace Avenue, Ash Avenue, Laurel Grove Avenue, Wolfe Grade, Manor Road, Bon Air Road, El Portal Drive, La Cuesta Drive, Eliseo Drive, and Barry Way. Existing traffic volumes in the vicinity of the project are presented in Figures 4.12-1 and 4.12-2.

Synchro/SimTraffic 9.0 computer software was used to determine the LOS at intersections based on the existing traffic volumes and the HCM 2010 methodology described above. Table 4.13.C summarizes the existing intersection LOS within the corridor.

A shown in Table 4.12.C, over the course of the AM peak hour, three intersections operate at LOS E or F (Wolfe Grade, La Cuesta Drive, and Eliseo Drive) and during the PM peak hour, one intersection operates at LOS E (La Cuesta Drive). Within each peak hour, some of the intersections experience further degradation during short trip spikes in traffic levels, particularly near schools.

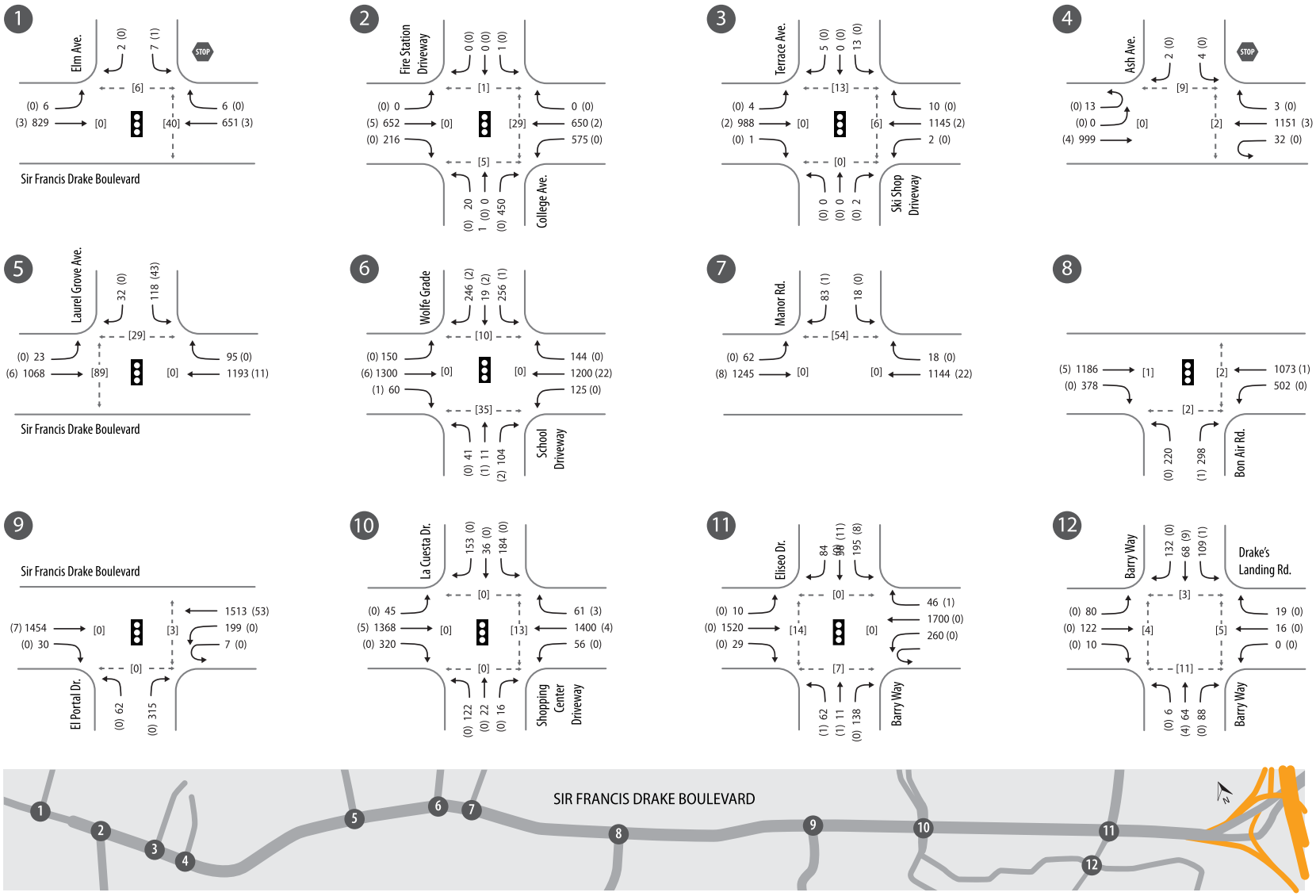
Table 4.12.C: Existing Intersection LOS and Delay Summary

Study Area No.	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
1	Elm Avenue/Sir Francis Drake Boulevard	4	A	8	A
2	College Avenue/Sir Francis Drake Boulevard	38	D	24	C
5	Laurel Grove Avenue/Sir Francis Drake Boulevard	9	A	6	A
6	Wolfe Grade/Sir Francis Drake Boulevard	77	E	33	C
8	Bon Air Road/Sir Francis Drake Boulevard	21	C	25	C
9	El Portal Drive/Sir Francis Drake Boulevard	19	B	14	B
10	La Cuesta Drive/Sir Francis Drake Boulevard	56	E	59	E
11	Eliseo Drive/Sir Francis Drake Boulevard	84	F	50	D

Source: Parisi Transportation Consulting, 2017
= exceeds County's level of service (LOS) criteria
LOS = level of service

4.12.2 Regulatory Framework

Policies relevant to transportation in the vicinity of the project site are drawn from the Marin CWP (2007), the City of Larkspur General Plan (1990), and the Transportation Authority of Marin. State laws pertaining to transportation also apply to the project area.



LSA

LEGEND

xx Vehicles (xx) Bicycles [xx] Pedestrians

FIGURE 4.12-1

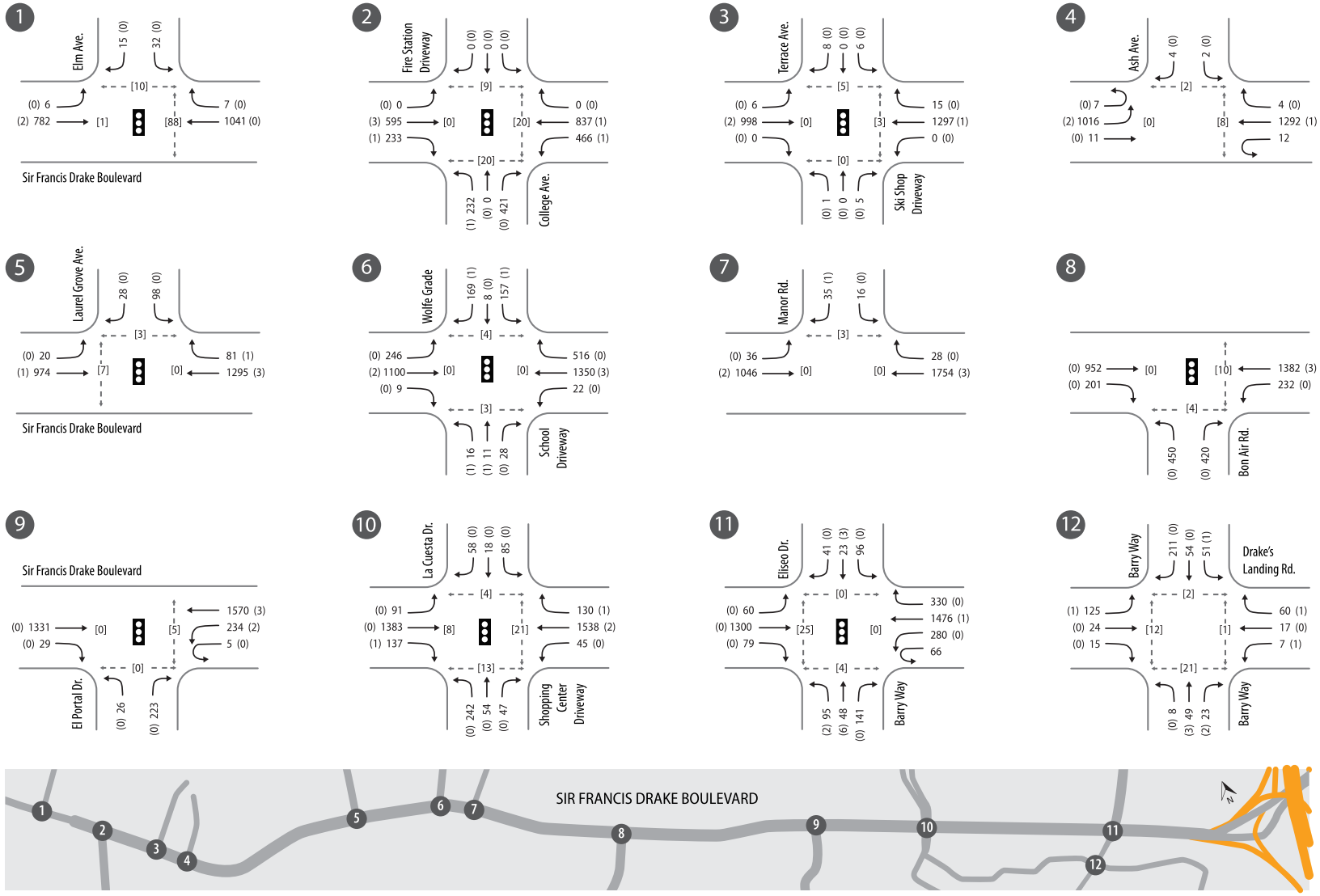
FIGURE NOT TO SCALE

SOURCE: Parisi, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Existing AM Vehicular Peak Hour Volumes

P:\BKF1501\g\EIR\Figure 4.12-1_Existing AM Vehicular Volume.cdr (3/13/2018)



LSA

LEGEND

xx Vehicles (xx) Bicycles [xx] Pedestrians

FIGURE 4.12-2

FIGURE NOT TO SCALE

SOURCE: Parisi, 2017

Sir Francis Drake Boulevard Rehabilitation Project

Existing PM Vehicular Peak Hour Volumes

P:\BKF1501\g\EIR\Figure 4.12-2_Existing PM Vehicular Volume.cdr (3/13/2018)

4.12.2.1 State Regulations

California Department of Transportation. Caltrans operates and maintains US 101. Caltrans guidelines generally require that a traffic study be conducted for all projects that generate 50 or more peak-hour trips and include analysis of all intersections where the project would add at least 50 trips. A traffic study was not conducted for the proposed project, as all new traffic is expected to be short term during project construction. No significant increase in weekday or weekend traffic is expected after the roadway is rehabilitated because the roadway itself does not generate traffic trips, and proposed improvements would not increase the design speed of the existing roadway.

4.12.2.2 Marin County

Transportation Authority of Marin. The Transportation Authority of Marin (TAM) is designated as both the Congestion Management Agency (CMA) and the transportation sales tax authority for the County. As the CMA, TAM addresses Marin's unique transportation issues, fulfilling the legislative requirements of Propositions 111 and 116, approved in June 1990. TAM was designated the sales tax authority in 2004 for the purpose of administering the 0.5-cent transportation sales tax in the County, passed by voters in November 2004 as Measure A. The proposed project would be funded by Measure A and is being jointly sponsored by TAM and the County of Marin Department of Public Works.

The TAM is responsible for managing a variety of transportation projects and programs in the County, working closely with all 11 cities and towns as well as the County.

Marin Countywide Plan. Policy TR-1.2 and Implementation Plan TR-1.e of the existing Marin Countywide Plan establishes LOS D or better as the goal for vehicles on streets and highways and performance standards for transit, bicycles, pedestrians, and other modes of transportation.

Marin County Unincorporated Area Bicycle and Pedestrian Master Plan. Goals 1 and 2 of the Marin County Unincorporated Area Bicycle and Pedestrian Master Plan (adopted June 2008) support improvements to bicycle and pedestrian facilities to make bicycling and walking safer and more convenient. The updated plan was completed for the unincorporated area for the Marin County DPW in 2006–2008 as a part of a countywide effort to update all local bicycle master plans. The project segment of SFDB is designated for a proposed Class II facility.

County of Marin Department of Public Works. The portion of SFDB under study is within the County of Marin's right-of-way; the County is responsible for maintenance of the roadway.

4.12.3 Significance Criteria

The project provides operational improvements at intersections along SFDB as well as improving facilities for non-motorized transportation, but would not increase capacity on SFDB and would therefore not result in permanent increased traffic. However, improvements to traffic flow in one area could lead to increased traffic flows to downstream intersections. The impacts of the project have been evaluated based on the results of traffic modeling without and with the proposed project.

The 2011 Marin CMP establishes LOS D as the minimum standard for urban and suburban arterial roadways. This criterion is reiterated by Marin Countywide Plan Policy TR-1.e. As described above, arterial roadway LOS is measured by average vehicle speed, but the performance of a roadway is also affected by the delay and LOS at individual intersections.

The following standards of significance are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this EIR, an impact to transportation/traffic would be considered significant if the proposed project would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersection, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

- Result in inadequate emergency access.

- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994) and the Marin County Congestion Management Program, the project may have a significant impact related to transportation and circulation if:

- Project traffic would significantly impact intersection LOS, resulting in an unacceptable service level (e.g., below LOS D).

- The project would not have adequate parking and internal circulation capacity to accommodate projected traffic so that offsite areas are not adversely affected.

- The project would not include provisions for pedestrian and bicycle circulation and bicycle and motorcycle parking and security.

4.12.4 Impacts and Mitigation Measures

This section identifies the potential significant traffic and circulation impacts associated with the proposed project. Mitigation measures are recommended, as appropriate, for significant impacts to reduce them to a less-than-significant level. This section also identifies impacts that are considered to be less than significant.

Short Term Construction Impacts. Construction of the proposed project would temporarily increase traffic volume in the vicinity of the project for employees commuting to the jobsite, equipment deliveries, and hauling trips. Heavy vehicles tend to be longer and travel more slowly than passenger vehicles, resulting in heavy vehicles using more roadway capacity than passenger vehicles. At this time it is estimated that the project would require 620 water truck trips, 1,640 pavement truck trips, and 740 concrete or demolition hauling trips for a total of 3,000 truck trips. In addition to equipment utilization of existing capacity, when considering the potential impacts of the construction phase it is important to consider the potential reductions in roadway capacity. According to the Impact of Lane Closures on Roadway Capacity Report published by the University of Florida Transportation Research Center,[196] roadway capacity is affected by lane narrowing due to construction barriers, the presence of heavy vehicles, the distance from the work zone to a downstream intersection, lane closures, etc. This study found that the closure of one lane can reduce the capacity of the roadway by more than the capacity of one lane. Capacity reductions have a greater effect on travel speed as traffic volume approaches capacity. It is likely that lane closures during the busiest hours of 6:00 a.m. to 6:00 p.m. could reduce travel speeds below 10 mph.

Long Term Operational Impacts. As noted in the Project Description (Section 3.0), the project proposes several enhancements to SFDB to improve the corridor's efficiency. A summary of these improvements includes:

- The project adds a third travel lane between El Portal Drive to Highway 101. The third lane provides additional storage capacity for vehicles traveling to south bound Highway 101 and reduces delays for motorists traveling to destinations east of Highway 101.

- The project reconfigures Eliseo Drive and La Cuesta Drive intersections to allow for simultaneous left turn movements from both the north and south bound approaches to SFDB. By allowing for the simultaneous left turn movements, the project can add additional time for through movements along SFDB reducing delay.

- The project adjusts the El Portal Drive intersection to accommodate the third travel lane. Results of the traffic analysis illustrate that traffic volume increases at this intersection and adding a third lane to the west has little benefit.

- The project adjusts the Wolfe Grade intersection's configuration to accommodate an at grade crosswalk. By adjusting the traffic signal's phasing, the project reduces delay at the intersection.

[196] Elefteriadou, L., M. Jain, and K. Heaslip. 2008. *Impact of Lane Closures on Roadway Capacity, Part B: Arterial Work Zone Capacity.* University of Florida, Gainesville, Florida. January.

- The project reconfigures and adds an additional left turn lane from SFDB to College Avenue, which will eliminate the backup of vehicles into the through travel lanes of westbound SFDB. This will result in no additional delay to the intersection. The primary benefit is the potential to reduce vehicle collisions occurring near the intersection as well as to improve pedestrian crossing safety at Ash Avenue.

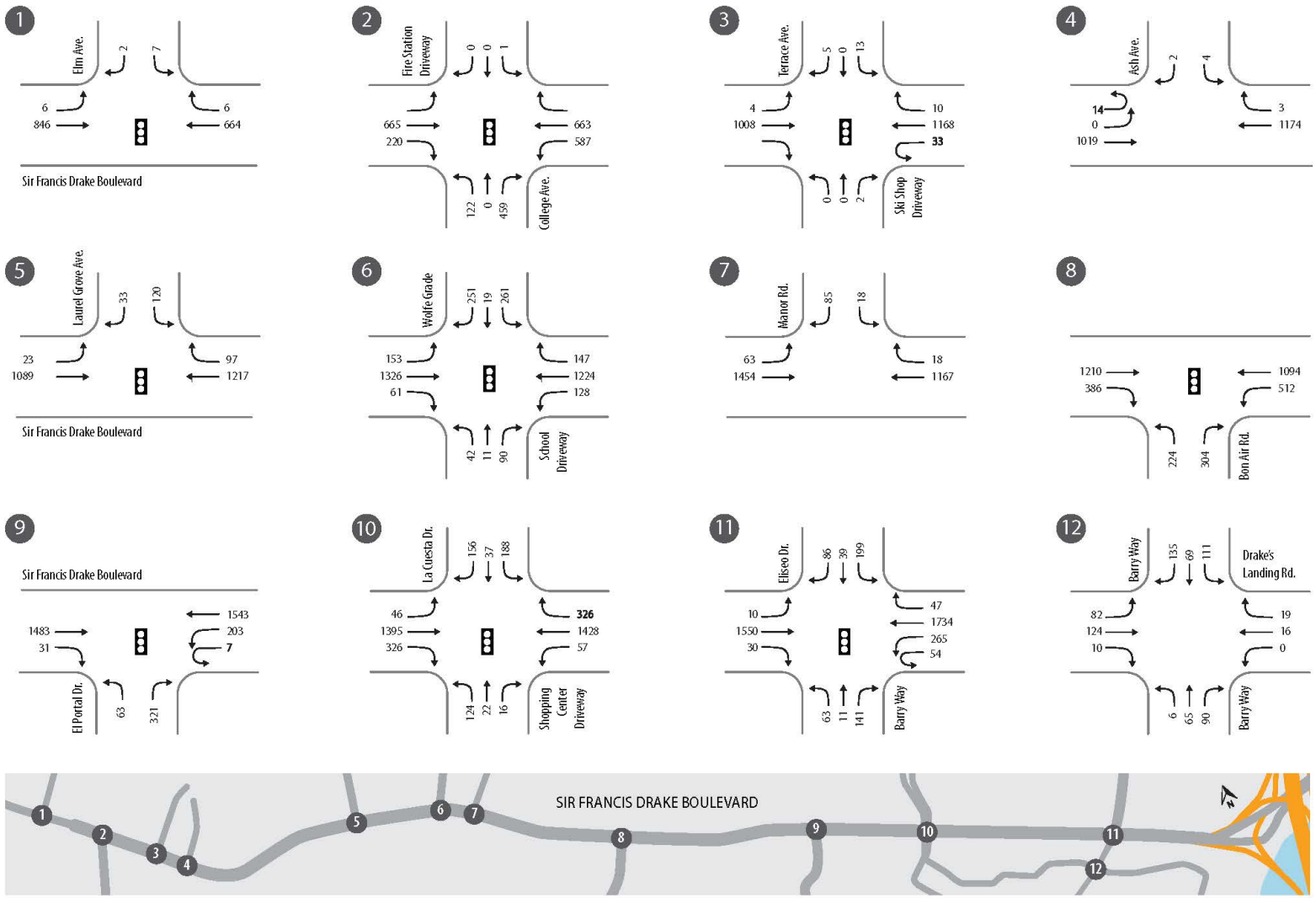
The proposed project cannot be completed in a short period of time. At this time it is estimated that the project could be completed in 2020. Therefore, an assessment of the project's impacts was conducted using the County's travel demand model to predict future traffic volumes in 2020. Project opening year (2020) traffic volumes are presented in Figures 4.12-3 and 4.12-4. These traffic volumes were analyzed with existing intersection geometrics and proposed intersection geometrics to identify future travel times and intersection delay. Table 4.12.D presents the resulting analysis of average travel times through the corridor during weekday peak periods.

Table 4.12.D: 2020 Sir Francis Drake Boulevard Travel Time

	Direction	Distance (mi)	No Project Travel Time (min)	With Project Travel Time (min)
AM Peak Hour				
College Avenue to Bon Air Road	Eastbound	0.88	2.2	2.3
	Westbound		3.1	2.5
Bon Air Road to Highway 101	Eastbound	0.94	6.0	2.8
	Westbound		3.2	2.4
PM Peak Hour				
College Avenue to Bon Air Road	Eastbound	0.88	1.9	1.9
	Westbound		5.4	3.4
Bon Air Road to Highway 101	Eastbound	0.94	5.0	3.0
	Westbound		4.5	2.6

Source: Parisi Transportation Consulting, 2017

As mentioned previously, progression and travel time through a corridor are affected by the operation of intersections along the corridor. Table 4.12.E compares intersection operation without and with the project. As Table 4.12.E shows, delay is expected to grow by 2020 at the three intersections (Wolfe Grade/SFDB, La Cuesta Drive/SFDB, and Eliseo Drive/SFDB) operating with unsatisfactory levels of delay during the AM peak hour in the existing condition. In addition, two intersections (La Cuesta Drive/SFDB and Eliseo Drive/SFDB) are expected to operate with unsatisfactory levels of delay during the PM peak hour by 2020. The proposed project would improve levels of delay at these three critical intersections. Although the intersection of Wolfe Grade/SFDB would still operate with unsatisfactory delay, the delay would be less than existing conditions. In addition, the proposed project would substantially reduce westbound vehicle queuing in the SFDB left-turn lane to College Avenue.



LSA

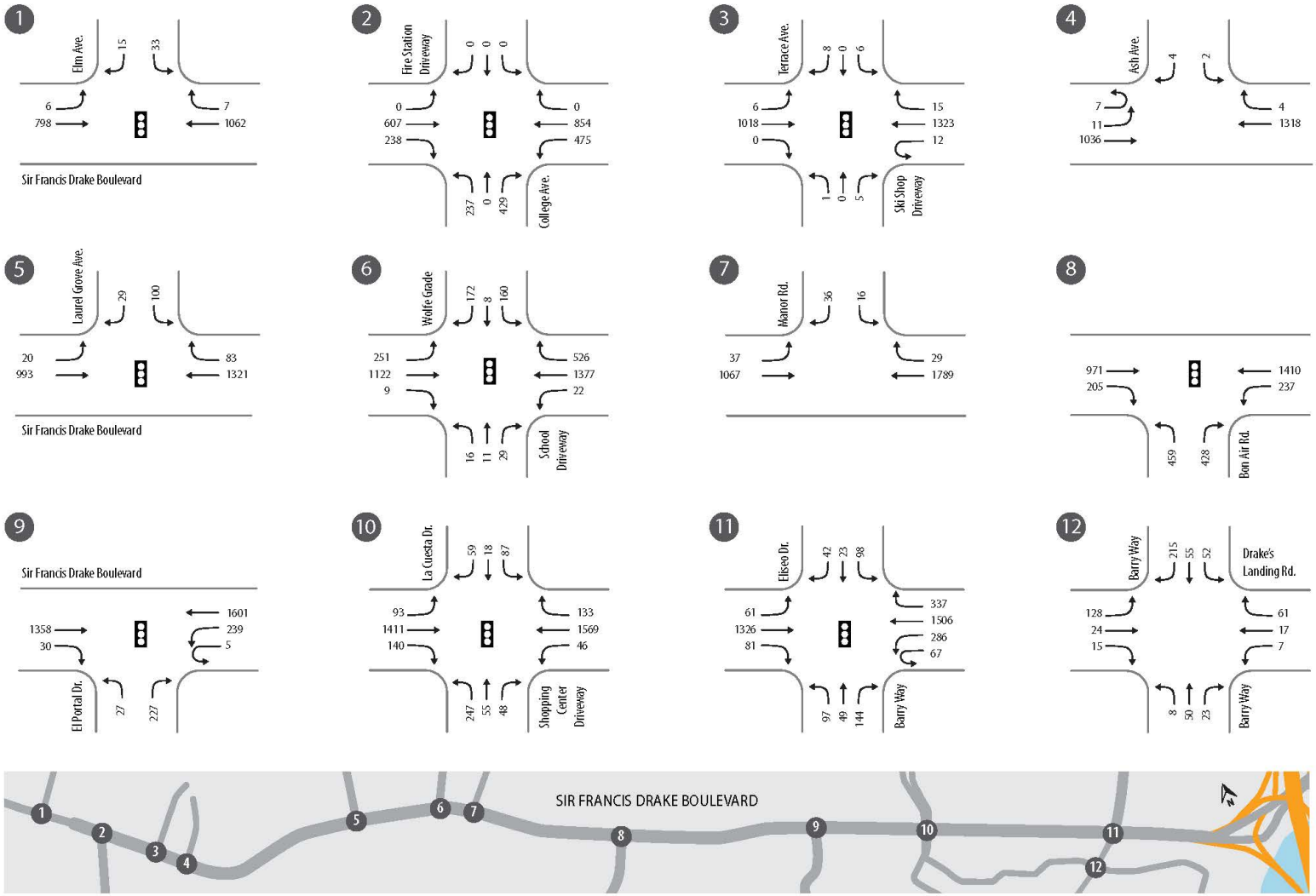
LEGEND
xx Vehicles

FIGURE 4.12-3

FIGURE NOT TO SCALE
SOURCE: Parisi, 2017

Sir Francis Drake Boulevard Rehabilitation Project
2020 AM Peak Hour Vehicular Volumes

P:\BKF1501\g\EIR\Figure 4.12-3_2020 AM Vehicular Volume.cdr (8/8/2017)



LSA

LEGEND
xx Vehicles

FIGURE 4.12-4

FIGURE NOT TO SCALE
SOURCE: Parisi, 2017

Sir Francis Drake Boulevard Rehabilitation Project
2020 PM Peak Hour Vehicular Volumes

P:\BKF1501\g\EIR\Figure 4.12-4_2020 PM Vehicular Volume.cdr (8/8/2017)

Table 4.12.E: 2020 Sir Francis Drake Boulevard Intersection LOS and Delay

Study Area No.	Intersection	No Project				With Project			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	Elm Avenue/SFDB	6	A	8	A	5	A	7	A
2	College Avenue/SFDB	41	D	30	C	24	C	25	C
5	Laurel Grove Avenue/SFDB	11	B	14	B	9	A	6	A
6	Wolfe Grade/SFDB	83	E	36	D	67	E	31	C
8	Bon Air Road/SFDB	26	C	27	C	25	C	24	C
9	El Portal Drive/SFDB	21	C	15	B	15	B	13	B
10	La Cuesta Drive/SFDB	85	F	75	E	46	D	45	D
11	Eliseo Drive/SFDB	>100	F	59	E	40	D	39	D

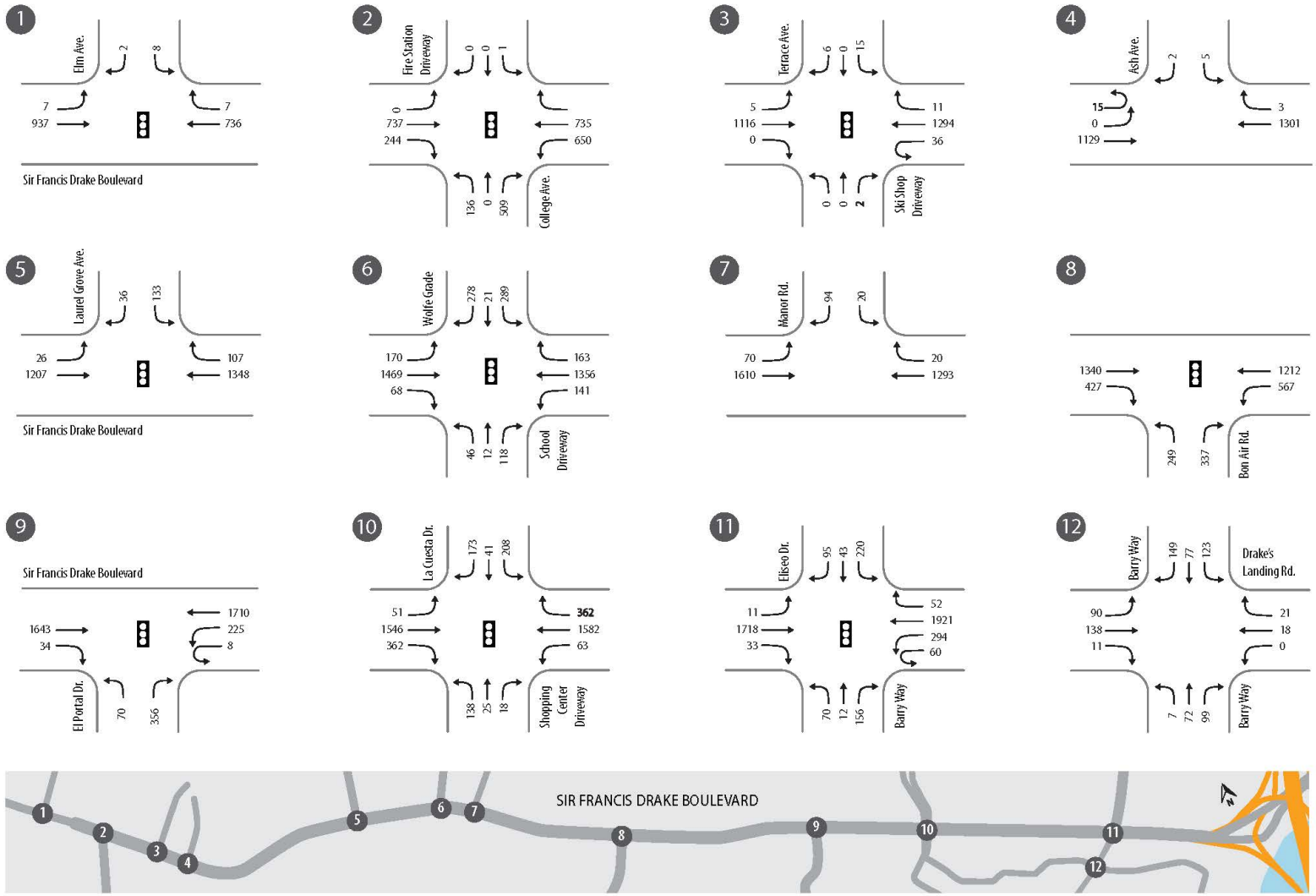
Source: Parisi Transportation Consulting, 2017
= exceeds County's level of service (LOS) criteria
LOS = level of service

Similar to the analysis conducted for project opening year (2020), the travel demand model was used to generate traffic volumes in the Countywide Plan horizon year, 2040. Horizon year (2040) traffic volumes are presented in Figures 4.12-5 and 4.12-6. These traffic volumes were analyzed with existing intersection geometrics and proposed intersection geometrics to identify future travel times and intersection delay. Table 4.12.F presents the resulting analysis of travel times through the corridor. Table 4.12.F shows that travel times would continue to degrade with the existing roadway configuration.

Table 4.12.F: 2040 Sir Francis Drake Boulevard Travel Time

	Direction	Distance (mi)	No Project Travel Time (min)	With Project Travel Time (min)
AM Peak Hour				
College Avenue to Bon Air Road	Eastbound	0.88	2.4	2.4
	Westbound		4.8	3.3
Bon Air Road to Highway 101	Eastbound	0.94	8.3	2.8
	Westbound		4.8	2.6
PM Peak Hour				
College Avenue to Bon Air Road	Eastbound	0.88	2.1	1.9
	Westbound		7.7	5.1
Bon Air Road to Highway 101	Eastbound	0.94	8.1	3.5
	Westbound		5.3	3.7

Source: Parisi Transportation Consulting, 2017



LSA

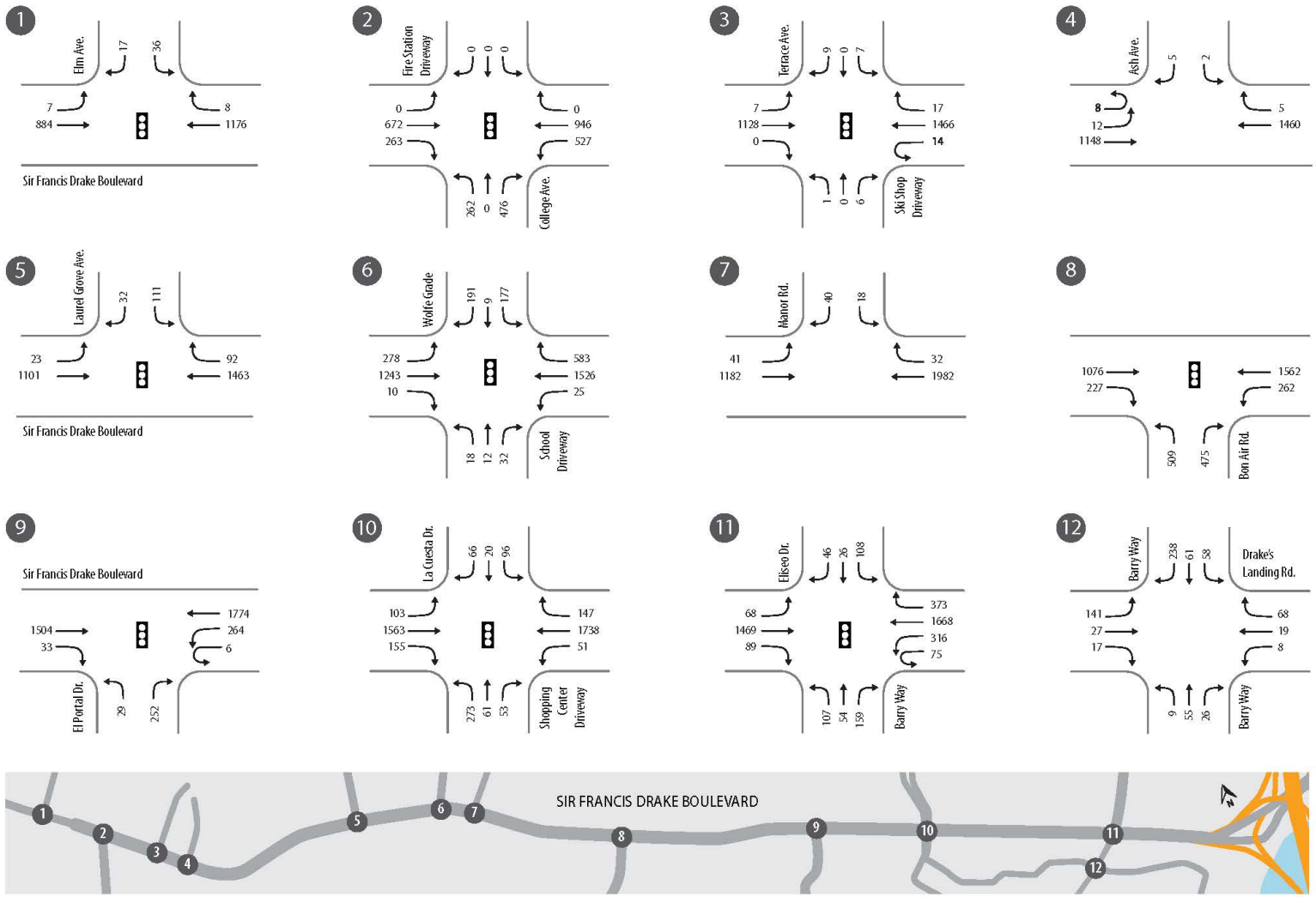
LEGEND
xx Vehicles

FIGURE 4.12-5

FIGURE NOT TO SCALE
SOURCE: Parisi, 2017

Sir Francis Drake Boulevard Rehabilitation Project
2040 AM Peak Hour Vehicular Volumes

P:\BKF1501\g\EIR\Figure 4.12-5_2040 AM Vehicular Volume.cdr (8/8/2017)



LSA

LEGEND
xx Vehicles

FIGURE 4.12-6

FIGURE NOT TO SCALE
SOURCE: Parisi, 2017

Sir Francis Drake Boulevard Rehabilitation Project
2040 PM Peak Hour Vehicular Volumes

P:\BKF1501\g\EIR\Figure 4.12-6_2040 PM Vehicular Volume.cdr (8/8/2017)

Table 4.12.G compares intersection operation without and with the project. As Table 4.12.G shows, by 2040 delay is expected to grow at the three intersections (Wolfe Grade/SFDB, La Cuesta Drive/SFDB, and Eliseo Drive/SFDB) operating with unsatisfactory levels of delay in 2020. The proposed project would reduce delays at these three intersections, although Wolfe Grade/SFDB would continue to operate unacceptably during the AM peak hour. In addition, the La Cuesta Drive/SFDB intersection – while improving by one LOS grade – would continue to operate unacceptably. However, the expected delays at these intersections under proposed project conditions in 2040 would be roughly equivalent to existing conditions. In addition, the proposed project would substantially reduce westbound vehicle queuing in the SFDB left-turn lane to College Avenue.

Table 4.12.G: 2040 Sir Francis Drake Boulevard Intersection LOS and Delay

		No Project				With Project			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Study Area No.	Intersection	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	Elm Avenue/SFDB	7	A	10	B	5	A	10	A
2	College Avenue/ SFDB	52	D	42	D	35	C	28	C
5	Laurel Grove Avenue/ SFDB	13	B	15	B	10	B	6	A
6	Wolfe Grade/SFDB	99	F	47	D	84	F	41	D
8	Bon Air Road/SFDB	27	C	30	C	24	C	27	C
9	El Portal Drive/ SFDB	30	C	18	B	20	C	15	B
10	La Cuesta Drive/SFDB	>100	F	>100	F	57	E	67	E
11	Eliseo Drive/SFDB	>100	F	89	F	46	D	52	D

Source: Parisi Transportation Consulting, 2017
Note: Intersections 3, 4, 7, and 12 are not modified or affected by the project.
= exceeds County's level of service (LOS) criteria
LOS = level of service

The following discussion analyzes impacts related to transportation and circulation that could result from project implementation and identifies mitigation measures, if appropriate. All impacts would be less than significant.

(1) Conflict with Established Measures of Effectiveness. As shown in Tables 4.12.E and 4.12.G, upon completion of construction activities and opening of the project, the project would have a beneficial effect on travel time within the corridor, which is the measure of effectiveness. However, project-related construction activities such as lane closures have the potential to impair travel time. Therefore, this impact is considered potentially significant.

Impact TR-1: Project-related construction activities could impair travel time and conflict with measures of effectiveness. (S)

Mitigation Measure TR-1: Prior to construction, the project contractor shall submit a Traffic Control Plan (TCP) to Marin County DPW for review and approval. During construction activities, the Marin County DPW and the project contractors working on the project shall adhere to all requirements of the TCP. Implementation of a TCP would maintain peak period travel time to the extent possible during construction. The TCP shall include the following:

- The route selection for movement of heavy equipment in the project vicinity shall be coordinated with the Marin County DPW, Marin County Sheriff's Department, and Police Departments for applicable cities and unincorporated communities (City of Larkspur and Town of Ross) to minimize traffic and physical road impacts. Truck drivers shall be notified and be required to use the most direct route between the project site and Highway 101.

- Heavy equipment transport, material transportation, or exportation to and from the project site shall not occur during weekday commute peak traffic periods and shall be coordinated by the contractor with the Marin County DPW, Marin County Sheriff's Department, and relevant city/town police departments.

- The TCP will define the use of flaggers, warning signs, lights, barricades, and cones, etc., according to standard guidelines required by the County, City of Larkspur, and Town of Ross as appropriate. Further, the contractor will maintain the work site, including traffic control, in a safe condition at all times, even outside of normal work hours. In addition, the TCP shall prohibit lane closure within any intersections along the corridor during the a.m. and p.m. peak periods (i.e., from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m.). Prior to the start of these peak periods, the contractor shall cover any open trenches and remove all construction equipment such that all lanes within the intersection are available for vehicular traffic during the peak periods.

- Paving activities, which are the most intrusive, will occur between the hours of 6:00 p.m. and 6:00 a.m.

- Construction activities completed within public street rights-of-way would require the use of a traffic control service, and any lane closures or traffic control measures would be consistent with those published in the *California Joint Utility Traffic Control Manual* (California Inter-Utility Coordinating Committee 2010). Implementing measures contained within the *California Joint Utility Traffic Control Manual* would facilitate safe passage of both construction vehicles and private vehicles.

- Debris and mud on SFDB caused by trucks shall be monitored daily, and a roadway cleaning program shall be instituted as necessary.

Significance After Implementation. Implementation of Mitigation Measure TR-1 would diminish the potential travel time impairment associated with project construction to less than significant.

(2) Exceed Roadway LOS Standard. The project segment is part of the CMP roadway network. Upon completion of construction activities and opening of the project, the project would not conflict with CMP LOS standards. However, construction activities such as lane closures have the potential to impair travel time along portions of the corridor resulting in unsatisfactory LOS. Therefore, this impact is considered potentially significant.

Impact TR-2: Project-related construction activities could conflict with level of service standards due to travel speed reductions. (S)

Mitigation Measure TR-2: Implement Mitigation Measure TR-1, which requires preparation and implementation of a TCP to maintain peak hour travel speeds to the extent possible during construction. (LTS)

Significance After Implementation. Implementation of Mitigation Measure TR-1 would diminish the potential travel time impairment associated with project construction to less than significant.

(3) Result in a Change in Air Traffic Patterns. The proposed project would not have any impact on air traffic patterns.

(4) Substantially Increase Hazards. Upon completion of construction the project will not increase hazards within the project area. The proposed project will improve vehicle flow, connect sidewalks, and provide Class II bike lanes. However, construction activities may require temporary closure of a travel lane, resulting in a temporary hazard to vehicles and bicycles. Construction equipment will be operating near or within the roadway. Additionally, pavement conditions could deteriorate during project construction. Such deterioration could lead to safety hazards. Traffic delays, safety concerns, and pavement damage created by construction traffic would represent a potentially significant impact.

Impact TR-3: Project construction activities could increase roadway hazards during the construction period due to the temporary closure of a travel lane, the presence of construction vehicles, and pavement damage created by construction traffic. (S)

Mitigation Measure TR-3: Implement Mitigation Measure TR-1, which requires preparation and implementation of a TCP. (LTS)

Significance After Implementation. Implementation of Mitigation Measure TR-1 would reduce the potential traffic safety hazards associated with project construction to less than significant.

(5) Result in Inadequate Emergency Access. The proposed project would implement improvements to intersections along the corridor as well as connect sidewalks and provide bicycle lanes. These proposed roadway improvements would result in improved travel time for emergency vehicles, and the impact is deemed beneficial. During construction, however, lane closures could result in inadequate emergency access. Therefore, the impact would be potentially significant.

Impact TR-4: Construction of the project could result in inadequate emergency access. (S)

Mitigation Measure TR-4: A schedule of construction activities and the Traffic Control Plan (TCP) prepared per Mitigation Measure TR-1 shall be provided to any pertinent local emergency service providers, including the Marin County Fire Department, Marin County Sheriff's Department, City of Larkspur Police and Fire Departments, Town of Ross Police Department, Ross Valley Fire Department, and paramedics.

Significance After Mitigation. Implementation of Mitigation Measure TR-4 would reduce potential emergency vehicle access impacts to a level of less than significant.

(6) Performance of Transit, Bicycle, or Pedestrian Facilities. Upon completion of construction and opening of the proposed project, the project would implement adopted policies, plans, and programs regarding connection of sidewalks and bicycle facilities. However, construction activity could decrease the performance of public transit by impairing travel time through the corridor. MCTD and Golden Gate Transit Services operate along SFDB. Lane closures and other construction activities would result in potentially significant impacts to transit service, particularly during weekdays; however, the impact would be significant in the short term, lasting only during the construction period.

Impact TR-5: Construction of the project could affect transit service through the project area during the construction period. (S)

Mitigation Measure TR-5: Prior to the start of the construction activities, MCTD and Golden Gate Transit Services shall be provided with detailed information regarding construction delays to plan a route deviation and/or notify passengers. Additionally, Mitigation Measure TR-1 would limit travel delays by restricting lane closures to off-peak periods.

Significance After Implementation. Implementation of Mitigation Measure TR-5 would reduce potential impacts to transit to a level of less than significant.

(7) Intersection LOS. The project would improve or maintain existing intersection LOS along the corridor. Therefore the proposed project would result in a less-than-significant impact on intersection operations.

(8) Parking and Internal Circulation. The proposed project is the rehabilitation of an existing roadway and does not have features found in commercial developments such an internal circulation system. On-street parking is available within the project area subject to location and time restrictions. Parking is not permitted near intersections where the majority of construction activity would occur. Upon completion of construction, the project would not remove any existing on-street parking spaces. Therefore, the proposed project would result in a less-than-significant impact.

(9) Pedestrian and Bicycle Circulation. Implementation of the project would complete a planned Class II bicycle lane within the project area. Implementation of the project would also widen and connect sidewalks within the project area. The post-construction impacts of the proposed project on pedestrian and bicycle circulation would be beneficial. Therefore, the impact is considered less than significant.

4.13 UTILITIES AND SERVICE SYSTEMS

This section assesses the project's potential environmental impacts on utilities and service systems as a result of the project including: water supply, wastewater collection and treatment, and solid waste. Information in this section is used to evaluate the potential impacts of the project with respect to the significance criteria set forth in the Impacts and Mitigation Measures section. The related topic of storm water drainage is evaluated in Section 4.9, Hydrology and Water Quality.

4.13.1 Setting

Water Supply. Marin Municipal Water District (MMWD) provides potable water to approximately 186,000 customers in central and southern Marin. Approximately 75 percent of MMWD water supply is from the local watershed and is stored in reservoirs.[197] Approximately 25 percent of MMWD water supply comes via pipeline from Sonoma County.

MMWD operates a transmission pipeline located within the pavement along SFDB in the project corridor. The pipeline conveys treated water from Ross Reservoir to customers in Greenbrae, Larkspur, and Corte Madera. The existing cast iron pipe is reaching the end of its useful life and has experienced numerous breaks in recent years.

Wastewater Treatment and Collection. Central Marin Sanitation Agency (CMSA) provides wastewater treatment in the project area. CMSA treats and releases approximately 6 billion gallons of wastewater as clean effluent into San Francisco Bay each year. [198]

The Ross Valley Sanitary District operates and maintains approximately 200 miles of collection sewer lines and 19 pumping stations that transport approximately 5 million gallons of wastewater per day to the CMSA for treatment.[199] Ross Valley Sanitary District has infrastructure that runs under, adjacent to, and across SFDB within the project area. The sanitary sewer lines are a combination of vitrified clay pipe and cast iron pipe.

Solid Waste. Zero Waste Marin or the Marin County Hazardous and Solid Waste Management Authority has jurisdiction over landfills in the County. Disposal sites in the County include the Redwood Landfill located at 8950 Redwood Highway in Novato, the Marin Resource Recovery Center and Marin Recycling Center located at 565 Jacoby Street in San Rafael, the Marin Recycling Center located at 535 Jacoby Street in San Rafael, Marin Sanitary Service located at 1050 Andersen Drive in San Rafael, and Marin Household Hazardous Waste Facility located at 565 Jacoby Street in San Rafael. All of these facilities receive solid waste from the vicinity surrounding the project site.

Redwood Landfill is currently full and is undergoing the process to close. CalRecycle reviewed and approved the Preliminary Closure and Postclosure Maintenance Plans for the Redwood Landfill in

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197 Marin Municipal Water District. 2017. Water. Available online at: https://www.marinwater.org/31/Water (last accessed June 13, 2017).

198 Central Marin Sanitation District. 2017. About Us. Available online at: https://www.cmsa.us/aboutus/ (last accessed July 7, 2017).

199 Ross Valley Sanitary District. 2017. About Us. Available online at: http://rvsd.org/about-us (last accessed June 13, 2017).

June 2017.[200] Marin Resources Recovery Center currently accepts all types of non-hazardous commercial and residential solid waste including construction and demolition debris and dirt, rock, and concrete. The recovery center processes approximately 3,000 tons of recyclables every month.[201] Marin Recycling Center processes all residential and commercial recyclable materials collected in curbside sorting bins. [202]Marin Sanitary Service provides weekly curbside service, biannual curbside clean-ups, and biannual bulky item collections in central Marin County.[203] Marin Household Hazardous Waste Facility accepts residential and commercial hazardous waste materials.

Telecommunications. A number of telecommunications providers currently service the County including AT&T and Comcast. AT&T and Comcast provide telephone, video, and data services. All of these service providers are privately owned and operated and recover the costs of operation, maintenance, and capital improvement through connection and user fees, which are collected from all customers. AT&T and Comcast possess infrastructure within the public right-of-way within the project corridor.

The California Public Utilities Commission, which regulates California's telecommunication industry, requires that local phone service providers anticipate and serve new growth. To meet this requirement, local phone service providers continually upgrade facilities and infrastructure, adding new facilities and technology to remain in conformance with California Public Utilities Commission tariffs and regulations, and to serve customer demand.

Energy (Electricity and Natural Gas). The Pacific Gas & Electric Company (PG&E) provides electricity and natural gas service to customers in the County. Refer to Table 4.13.A for the percentages of PG&E's renewable/nonrenewable energy sources. The table includes all PG&E-owned generation plus PG&E's power purchases. PG&E charges connection and user fees for all new development in addition to sliding rates for electrical and natural gas service based on use. PG&E currently possess infrastructure within the public right-of-way within the project corridor.

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200 Department of Resources Recycling and Recovery. 2017. Approval of Preliminary Closure and Postclosure Maintenance Plans for the Redwood Landfill, Facility No. 21-AA-0001. 15 June.

201 Marin Sanitary Service. 2017. Marin Resource Recovery Center. Available online at: http://marinsanitaryservice.com/marin-resource-recovery-center-mrrc/ (last accessed July 6, 2017).

202 Marin Sanitary Service. 2017. Marin Recycling Center (MRC). Available online at: http://marinsanitaryservice.com/marin-recycling-center-mrc/ (last accessed July 6, 2017).

203 Marin Sanitary Service. 2017. MSS Spring Update. April. Available online at: http://marinsanitaryservice.com/mobius/msswp-content/uploads/2014/06/2017-Spring-Newsletter-Final-web-op.pdf (last accessed July 6, 2017).

Table 4.13.A: PG&E's 2016 Electricity Power Mix

Energy Source	Percentage
Renewable*	33
Nuclear*	24
Hydroelectric Operations*	12
Natural Gas	17
Unspecified	13

Source: PG&E. 2017. *Exploring Clean Energy Solutions.* Website: http://www.pge.com/en/about/environment/pge/cleanenergy/index.page (accessed June 13, 2017).
Notes:
* These resources are greenhouse gas-free and/or renewable.
Due to rounding, the numbers above total 99 percent.

4.13.2 Regulatory Framework

Policies relevant to utilities and service systems in the vicinity of the project site are drawn from the Marin CWP (2007), the City of Larkspur General Plan (1990), and the Marin Integrated Waste Management Plan. State laws and regulations pertaining to solid waste also apply to the project area.

4.13.2.1 State Regulations

California Solid Waste Reuse and Recycling Access Act of 1991. The California Solid Waste Reuse and Recycling Access Act of 1991 (Public Resources Code Sections 42900 through 42911) requires that any development project for which an application for a building permit is submitted shall include adequate, accessible areas for collecting and loading recyclable materials.

State Mandate AB 939 California Integrated Waste Management Act. The California Integrated Waste Management Act of 1989 (AB 939) requires local cities and counties to adopt an Integrated Waste Management Plan (IWMP) to establish objectives, policies, and programs relative to waste disposal, management, source reduction, and recycling. AB 939 mandates a reduction of waste being disposed and required jurisdictions to divert 25 percent of waste out of landfills by 1995 and 50 percent by 2000. The law requires that, after 2000, jurisdictions maintain a diversion rate of 50 percent.

California Green Building Standards Code. Effective January 1, 2017, all jurisdictions, including those without a construction and demolition ordinance, are required to divert 65 percent of the construction waste materials generated during the project.[204]

CEQA Guidelines Appendix F, Energy Conservation. CEQA requires that EIRs include a discussion of the potential energy impacts of a project to the extent relevant and applicable, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy (refer to PRC 21100[b][3]).

[204] CalRecycle. 2017. Local Government Construction and Demolition (C&D) Guide Frequently Asked Questions. Available online at: http://www.calrecycle.ca.gov/lgcentral/library/CandDModel/Instruction/FAQ.htm (last accessed July 7, 2017).

4.13.2.2 Marin County

Zero Waste Marin. Zero Waste Marin or the Marin Hazardous and Solid Waste Joint Powers Authority (JPA) is comprised of Marin County and its incorporated cities and towns: Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Novato, Ross, San Anselmo, San Rafael, Sausalito, and Tiburon. Zero Waste Marin ensures Marin's compliance with the California Integrated Waste /Management Act and its waste reduction mandates. In 1997, the California Integrated Waste Management Board (CIWMB) recognized the Zero Waste Marin as a Regional Agency. This Regional Agency status allows Zero Waste Marin members to report to the State as one political body (instead of 12) as was previously required.

Marin Countywide Plan (2007). Policies relevant to the provision of utilities and service systems include:

Policy PFS-1.4 Reduce Demand on Public Facilities. Reduce per capita and total demand for water and wastewater treatment, and enhance storm water management through integrated and cost effective design, technology, and demand reduction standards for new development and redevelopment.

> *Program PFS-1.d Reduce Demand on Public Facilities.* Assess and revise community development and facilities rules to incorporate least-cost (including environmental, economic, and societal costs) and integrated resources planning for water, wastewater, and storm water infrastructure.

Goal PFS-2 Sustainable Water Resources. Assure a reliable, sustainable water supply for existing and future development while protecting the natural environment.

Policy PFS-2.1 Conserve Water and Utilize Sustainable Sources. Promote conservation to increase the responsible use and reliability of water supplies. Reduce the waste of potable water through efficient technologies, design, and management practices, and through better matching of the source and quality of water to the user's needs.

Policy PFS-2.3 Manage Water Resources Sustainably. Manage water resources to ensure equitable amounts of clean water for all users, to support wildlife habitat, and to preserve natural resources within the sustainable limits of water supplies. (See also the Natural Systems and Agriculture Element, Water Resources Section.)

Goal PFS-3 Reduction, Safe Processing, and Reuse of Wastewater. Continue to enhance the Alternative Onsite Wastewater Monitoring Program. This program ensures the proper operation of alternative and innovative wastewater system designs. Continue to work with manufacturers, designers, installers, end users, and the Regional Water Quality Control Board to evaluate the effectiveness and capabilities of these alternatives to traditional septic system designs. Work with stakeholders to periodically update design guidelines and regulations in the light of evolving best practices.

Policy PFS-3.1 Reduce Toxics in Wastewater. Minimize the potential for pollution to water and other resources from sewage treatment.

Policy PFS-3.2 Promote Alternative Wastewater Systems. Enhance water quality through use of alternative wastewater treatment methods.

Policy PFS-3.3 Reduce Storm Water Volume. Implement appropriate upstream water-saving technologies to reduce storm water volumes and increase percolation. Increase permeable surfaces and encourage on-site percolation to reduce storm water volume and potential overflow of wastewater treatment facilities.

Program PFS-3.a Reduce Wastewater Volume. Work with sanitary districts and Environmental Health to assess alternative point-source wastewater technologies, including State approved graywater systems; NSF-approved waterless urinals and composting toilets; pervious surfaces for roads, driveways, and parking lots; and subsurface drip dispersal. Provide public information and update codes to promote safe, appropriate technologies. Urge water districts to consider volumetric billing and tiered water rate structure, and partner with waste disposal providers to reduce the volume of wastewater that must be treated.

Program PFS-3.d Enforce Regulations. Continue to update and enforce regulations for septic systems and groundwater wells that ensure that safe drinking water will continue to be available (see also WR-2.c and PFS-3.c).

Goal PFS-4 Efficient Processing and Reduced Landfill Disposal of Solid Waste. Minimize, treat, and safely process solid waste materials in a manner that protects natural resources from pollution while planning for the eventual reuse or recycling of discarded material to achieve zero waste.

Policy PFS-4.1 Reduce the Solid Waste Stream. Promote the highest and best use of discarded materials through redesign, reuse, composting, and shared producer responsibility. Emphasize a closed-loop system of production and consumption.

Policy PFS-4.2 Protect Environmental Health. Require the use of waste processing and disposal techniques that prevent the contamination or other impairment of natural resources.

Program PFS-4.b Divert Construction Waste. Continue to implement the construction and demolition recycling waste ordinance to divert construction waste from landfills.

Program PFS-4.c Reduce Waste at Landfill. Continue to pursue aggressive recycling, resource recovery, and composting strategies to reduce the amount of waste diverted to landfill.

4.13.2.3 City of Larkspur

City of Larkspur General Plan. Policies relevant to utilities and service systems include:

Environmental Resource Element

Goal 5. Reduce water consumption.

Policy j. Support the efforts of the Marin Municipal Water District to reduce water consumption.

Action Program 16. Require new and replacement public and private landscaping to use drought tolerant plantings

Goal 6. Reduce the total volume of the City's waste stream.

Policy k. Support programs to recycle paper, cardboard, glass, metal, plastics, motor oil, and to compost or generate energy from tree prunings, brush, and other vegetation.

4.13.3 Significance Criteria

Pursuant to the CEQA Guidelines, Appendix G, Environmental Information Form, and Appendix F, Energy Conservation, the project may have a significant impact on public services, utilities, or energy if it would:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Have insufficient water supplies available to serve the project from existing entitlements and resources.
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments.
- Be served by a landfill with insufficient permitted capacity to accommodate the project’s solid waste disposal needs.
- Not comply with federal, state, and local statutes and regulations related to solid waste.
- Require or result in the construction of new electrical or telecommunications facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Result in the inefficient, wasteful, or unnecessary consumption of energy.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to public services if it would:

- Propose a significant increase in the consumption of potable water.

- Require substantial expansion of water supply, treatment or distribution facilities.
- Require expansion of wastewater treatment or distribution facilities.
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.

4.13.4 Impacts and Mitigation Measures

The following discussion analyzes impacts related to utilities and service systems that could result from project implementation and identifies mitigation measures, if appropriate. All impacts would be less than significant.

(1) Water. Short-term demand for water may occur during construction activities. Water demand for soil watering (fugitive dust control), cleanup, and other activities would be temporary and would cease once construction is complete. Overall, construction activities would require minimal water, would be short term, and would not result in any adverse impacts on the existing water system or available water supplies. Therefore, short-term construction activities would result in less-than-significant impacts to water supply, treatment, or distribution.

As described in Section 3.5.4, MMWD Water Pipeline, the proposed project would replace approximately 8,000 feet of existing potable water pipeline from Manor Road toward the Town of Ross (Segment 1) and from Eliseo Drive to Highway 101. The pipeline would be installed by the open trench method. New pipeline segments and laterals would be installed to connect to the existing services along SFDB. The old pipeline segments would be plugged and abandoned. Water service for customers along the project alignment would be disrupted at the tie-in of the new main to the existing water system and as water services are transferred from the old main to the new main. However, customers would be notified 24 to 48 hours in advance of the disruption of service. In addition, water service would only be disrupted between the hours of 8 a.m. and 5 p.m. Therefore, because customers would be notified of the disruption of service, impacts would be considered less than significant and no mitigation is required.

(2) Wastewater. No significant increase in wastewater flows is anticipated as a result of construction activities on the project site. Sanitary services during construction would likely be provided by portable toilet facilities, with waste transported off-site for treatment and disposal. Therefore, during construction, potential impacts to wastewater treatment and wastewater conveyance infrastructure would be less than significant, and no mitigation is required.

The project site has existing sanitary sewer pipes that run under, adjacent to, and across SFDB within the project area. Construction of the proposed project would not require pipe replacement or relocation; the only improvements would include adjusting the structure lids to match the final pavement grade of SFDB. Therefore, no disruptions of service are anticipated. No impacts to wastewater infrastructure would occur with implementation of the proposed project and no mitigation is required.

(3) Solid Waste. Solid waste would be generated during construction and demolition activities. The majority of the waste generated during construction and demolition would be paving materials such as asphalt, bricks, concrete, and dirt as well as waste generated by construction workers. The generation of construction waste would be temporary, and would cease when construction is complete. The majority of waste/materials generated during construction and demolition activities would be either reused on site or recycled at the Marin Resource Recovery Center, which is a Zero Waste Marin Certified Facility,[205] located approximately 1 mile to the northeast of the project site. The proposed project would be required to recycle at least 65 percent of waste generated during construction and demolition activities, as required by the California Green Building Standards Code (CALGreen) mandatory diversion requirements effective January 2017. Since the proposed project would be required to recycle 65 percent of the construction and demolition debris generated by the project and materials would be reused on site, it can be assumed that the proposed project would not generate a substantial amount of solid waste from construction and demolition activities. Construction and demolition waste that cannot be recycled or reused would also be accommodated at the Marin Resource Recovery Center. The Marin Resource Recovery Center has a permitted capacity of 2,640 tons/day.[206]

Waste collected during road maintenance and operation of the proposed project would be limited and similar to the existing condition. Therefore, implementation of the proposed project would result in a less-than-significant impact to solid waste and landfill facilities, and no mitigation is required.

(4) Telecommunications. Development of the project would occur in a location that currently has telephone, cable, and internet services. AT&T and Comcast possess infrastructure within the public right-of-way within the project corridor. Construction of the proposed project would not require replacement or relocation of telecommunication facilities; the only improvements would include adjusting the structure lids to match the final pavement grade of SFDB. Therefore, no disruptions of service are anticipated. No impacts to telecommunication facilities would occur with implementation of the proposed project and no mitigation is required.

(5) Energy (Electricity and Natural Gas). Development of the proposed project would occur in a location that currently has electricity and natural gas services provided by PG&E. Implementation of the project would not result in a long-term demand for electricity and natural gas nor would the project require new service connections or construction of new off-site service lines or substations to serve the project.

Construction of the proposed project would not require replacement or relocation of electricity or natural gas facilities; the only improvements would include adjusting the structure lids to match the final pavement grade of SFDB. Therefore, no disruptions of service are anticipated.

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[205] Certified construction and demolition facilities have been approved by Zero Waste Marin and achieve greater than 50 percent diversion rate.

[206] CalRecycle, 2010. Solid Waste Facility Permit 21-AA-0005, dated May 17, 2010. Available online at: http://www.calrecycle.ca.gov/SWFacilities/Directory/21-AA-0005/Document (Accessed August 29, 2017).

Vehicle fuel would be required for construction activities; however, construction activities are not anticipated to result in an inefficient use of energy as gasoline and diesel fuel would be supplied by construction contractors who would conserve the use of their supplies to minimize their costs on the project.

The nature of proposed improvements would not require substantial amounts of energy for either construction or maintenance purposes. Therefore, the proposed project would not use non-renewable resources in a wasteful or inefficient manner. No impacts to electricity or natural gas facilities would occur with implementation of the proposed project and no mitigation is required.

5.0 ALTERNATIVES ANALYSIS

The *CEQA Guidelines* require the analysis of a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the project's basic objectives and avoid or substantially lessen any of the significant effects of the project. The range of alternatives required in an EIR is governed by the "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice.[207] CEQA states that an EIR should not consider alternatives "whose effects cannot be ascertained and whose implementation is remote and speculative."

This chapter describes the alternatives to the project, evaluates the significant environmental impacts associated with each alternative relative to those resulting from the proposed project, and discusses the ability of each alternative to meet the project objectives. A discussion of the environmentally superior alternative is also included in this chapter as required by CEQA.

The following objectives were initially listed in Chapter 3.0, Project Description, of this Draft EIR and are repeated here to help inform the evaluation of alternatives.

- Repair pavement for a 20-year design life.
- Improve traffic flow and reduce congestion by reducing travel time along the SFDB corridor during the peak period and providing a third eastbound travel lane between El Portal Drive and Highway 101
- Close sidewalk gaps and improve pedestrian crossing safety at signalized and certain un-signalized intersections.
- Improve transit access by modifying bus stop layouts, providing safer crossings to access transit stops, and relocating the transit stop at College of Marin.
- Improve bicycle access and safety by improving the north-south connections at intersections, improving pavement conditions and refreshing striping.
- Construct an economically viable project: provide roadway-related improvements balanced with available and reasonably foreseeable funding.
- Implement a comprehensive approach to providing improvements, including utility improvements, along the entire project corridor.

During the outreach process, MMWD identified the need to upgrade pipelines within the project area. The County plans to integrate the MMWD pipeline into the proposed project to minimize inconvenience to the public related to the construction of two separate projects along SFDB.

The proposed project has been described and analyzed in the previous chapters with an emphasis on significant impacts resulting from the proposed project, with mitigation measures recommended to reduce or avoid these impacts. The following discussion is intended to inform the public and

[207] *CEQA Guidelines,* 2009, Section 15126.6

decision-makers about the relative impacts of four potentially feasible alternatives to the proposed project. The five alternatives to the proposed project discussed in this chapter include the following:

- The **No Project Alternative** assumes that the proposed roadway improvements and water pipeline replacement would not be implemented as part of the SFDB Rehabilitation Project. Existing traffic and roadway conditions would continue. The County would continue to maintain and repair the roadway on an as needed and ad hoc basis. The roadway design life would not be extended and safety would not be enhanced. MMWD would initiate a separate, independent pipeline replacement project. Although some impacts associated with construction would be reduced or avoided by the smaller scale repairs of the roadway and pipeline replacement under the No Project Alternative, the environmental benefits of the project, such as pedestrian and bicycle improvements, would not be realized. In general, the No Project Alternative would not achieve the project objectives.

- The **General Maintenance Alternative** includes pavement rehabilitation, re-striping of the roadway, replacing water pipelines, installing conduits for a future adaptive signal system, upgrading intersections to comply with current accessibility standards (including adding a crosswalk at the Wolfe Grade intersection), replacing the existing metal beam guardrail with a fence, and updating the signal timing to current standards. Although some impacts associated with construction would be reduced or avoided due to the reduced area of construction, this alternative would not reconfigure the intersections to operate more efficiently; therefore vehicle travel times through the corridor will not decrease. Thus, the General Maintenance Alternative does not achieve the project objective of congestion relief.

- The **Congestion Relief Alternative** includes intersection modifications to improve efficiency and would add the third travel lane between El Portal Drive and Highway 101. Except in locations where re-paving would be necessary to accommodate the intersection modifications, the County would continue to maintain and repair the roadway on an as needed and ad hoc basis. The design life of the roadway would not be extended. MMWD would initiate a separate, independent pipeline replacement project preceding the SFDB Rehabilitation project. Although some impacts associated with construction would be reduced or avoided by the smaller scale roadway reconfiguration, project benefits including pavement rehabilitation as well as pedestrian and bicycle improvements would not be realized. In general, the Congestion Relief Alternative would not achieve the project objectives.

- The **Corridor Pedestrian and Bicycle Improvements Alternative** includes the multi-use corridor between Eliseo Drive and Bon Air Road, widening of the sidewalk along Bacich Elementary School's frontage, closing the sidewalk gap along the Marin Catholic frontage, and improving the pedestrian connection between Manor Road and Wolfe Grade. This alternative would also include safety improvements at several intersections with SFDB including Elm, Ash, West McAllister, and Laurel Grove Avenues. The roadway design life would not be extended. MMWD would initiate a separate, independent pipeline replacement project preceding the SFDB Rehabilitation project. This alternative would not reconfigure the intersections to operate more efficiently; therefore vehicle travel times through the corridor would not decrease. Although some impacts associated with construction would be reduced or avoided due to the reduced

area of construction, the Corridor Pedestrian and Bicycle Improvements Alternative would not achieve the project objective of congestion relief and pavement rehabilitation.

- The **No Pipeline Alternative** would not replace MMWD water pipelines along SFDB as part of the SFDB Rehabilitation project. MMWD would initiate a separate, independent pipeline replacement project preceding the SFDB Rehabilitation project. Although some impacts associated with construction would be reduced or avoided due to the reduced area of construction for the roadway improvements; this alternative would not make the proposed improvements in the most efficient manner to minimize disruption associated with project construction. Therefore, the cumulative impacts of this alternative would be greater than the proposed project.

Following is a discussion of each alternative and an analysis of the anticipated environmental impacts of each alternative. This analysis compares the anticipated impacts of each alternative to the impacts associated with the proposed project; the discussion includes a determination as to whether or not each alternative would reduce, eliminate, or create new significant impacts. Table 5.A provides a summary of the project elements proposed as part of each alternative.

5.1 NO PROJECT ALTERNATIVE

5.1.1 Principal Characteristics

In the No Project Alternative, the existing conditions of the project site would remain. Proposed roadway improvements would not be constructed, existing traffic would increase, and roadway conditions would decline. As described in Chapter 3.0, Project Description, the existing road has pavement distress that includes rutting, delamination, potholing, as well as alligator and block cracking. Under the No Project Alternative, the road would continue to degrade, with periodic repair and maintenance of the roadway by the County. Prior maintenance has included removing and replacing damaged sections of roadway and overlays of asphalt concrete.

The existing MMWD waterline would not be replaced with this alternative. As described in Chapter 3.0, Project Description, the existing cast iron pipe is reaching the end of its useful life and has experienced numerous breaks in recent years. Under the No Project Alternative, MMWD would initiate a separate, independent pipeline replacement project.

While this alternative avoids the majority of the impacts that would result from implementing the proposed project, some of the project's public benefits would not be achieved, such as enhancing pedestrian safety, improving transit and bicycle access, and reducing traffic congestion. The continued reliability of the MMWD water system would be achieved as a separate project. Vehicle travel times would continue to worsen if traffic flow improvements are not implemented. The No Project Alternative would not provide a long-term solution for rehabilitating damaged sections of the roadway, and would not improve traffic flow through the project corridor.

Table 5.A: Summary of Alternatives

Components	Alternatives					
	Proposed Project	No Project	General Maintenance	Congestion Relief	Corridor Pedestrian and Bicycle Improvements	No Pipeline
Congestion Relief and Maintenance	• Pavement Rehabilitation • Roadway Striping • Accessibility Improvements • Guardrail Replacement • Signal Timing • Future Adaptive Infrastructure Accommodation • Additional Third Lane between El Portal Drive and Highway 101 • Signal Technology Modifications • Eliseo Drive Intersection Improvements • La Cuesta Drive Intersection Improvements • El Portal Drive Intersection Improvements • Bon Air Road Intersection Improvements • College Avenue Intersection Improvements		• Pavement Rehabilitation • Roadway Striping • Accessibility Improvements • Guardrail Replacement • Signal Timing • Future Adaptive Infrastructure Accommodation	• Additional Third Lane between El Portal Drive and Highway 101 • Signal Technology Modifications • Eliseo Drive Intersection Improvements • La Cuesta Drive Intersection Improvements • El Portal Drive Intersection Improvements • Bon Air Road Intersection Improvements • College Avenue Intersection Improvements	• Providing a shared use path along the north side of Sir Francis Drake Boulevard between Eliseo Drive and Bon Air Road • Bacich Elementary School Frontage • Marin Catholic High School Frontage • Manor Road Improvements	• Pavement Rehabilitation • Roadway Striping • Accessibility Improvements • Guardrail Replacement • Signal Timing • Future Adaptive Infrastructure Accommodation • Additional Third Lane between El Portal Drive and Highway 101 • Signal Technology Modifications • Eliseo Drive Intersection Improvements • La Cuesta Drive Intersection Improvements • El Portal Drive Intersection Improvements • Bon Air Road Intersection Improvements • College Avenue Intersection Improvements

Table 5.A: Summary of Alternatives

Components	Alternatives					
	Proposed Project	No Project	General Maintenance	Congestion Relief	Corridor Pedestrian and Bicycle Improvements	No Pipeline
Pedestrian Safety Improvements	• Elm Avenue Transit Stop • Ash Avenue Intersection • West McAllister Avenue Intersection • Laurel Grove Avenue Intersection • Bacich Elementary School Frontage • Manor Road Improvements • Marin Catholic High School Frontage					• Elm Avenue Transit Stop • Ash Avenue Intersection • West McAllister Avenue Intersection • Laurel Grove Avenue Intersection • Bacich Elementary School Frontage • Manor Road Improvements • Marin Catholic High School Frontage
Improving Access to Bicyclists and Pedestrians	• Providing a shared use path along the north side of Sir Francis Drake Boulevard between Eliseo Drive and Bon Air Road					• Providing a shared use path along the north side of Sir Francis Drake Boulevard between Eliseo Drive and Bon Air Road
MMWD Water Pipeline	• Pipeline Replacement		• Pipeline Replacement			

5.1.2 Analysis of the No Project Alternative

The No Project Alternative is evaluated for all environmental topics analyzed in this Draft EIR.

Aesthetics. Implementation of the No Project Alternative would result in no roadway construction in the project area, with the exception of periodic maintenance to repair damaged sections of the roadway. The No Project Alternative would not alter the visual character of the area because the roadway would not be re-configured, vegetation would not be removed, and no pedestrian/bicycle improvements would be constructed. Under the No Project Alternative, no nighttime lighting would be required for construction; therefore, the No Project Alternative would avoid impacts related to nighttime light and glare. Under the No Project Alternative, the aesthetics of the roadway would not be improved with no replacement of the existing metal guardrail with a new cable fence, and no closure of sidewalk gaps.

Air Quality. Implementation of the No Project Alternative would include periodic maintenance activities to repair damaged sections of the roadway. These activities would require grading or construction activities and would generate a small number of trips to the project site. While the repair activities would be less than the proposed project construction activities, the No Project Alternative, like the proposed project, would still result in air quality impacts, particularly emissions of toxic gases and particulate matter. However, air quality impacts under the No Project Alternative would be less than the proposed project.

Biological Resources. The No Project Alternative, would maintain existing landscape features, and therefore, would avoid the significant impacts of the project on biological resources. The No Project Alternative would not diminish the habitat of protected plant and animal species, including riparian habitat associated with Wolfe Grade Creek, and would not result in the fill of wetlands in the project area. Therefore, impacts to biological resources would be reduced under the No Project Alternative when compared to the proposed project.

Cultural Resources. The No Project Alternative would result in minimal ground disturbance in the project area during periodic maintenance to repair damaged sections of the roadway. Therefore, the alternative would not be expected to result in impacts to prehistoric or historic archaeological or paleontological resources. Therefore, impacts to cultural resources would be reduced under the No Project Alternative when compared to the proposed project.

Geology and Soils. Under the No Project Alternative, the project site would continue to be subject to seismic hazards, erosion, landslide, and soil deformation and movement.

Global Climate Change. Implementation of the No Project Alternative would include periodic maintenance activities to repair damaged sections of the roadway. While these activities would be of lesser magnitude than the construction activities proposed as part of the project, the No Project Alternative, like the proposed project, would result in global climate change impacts, namely generation of GHG emissions associated with roadway maintenance. Therefore, global climate change impacts under the No Project Alternative would be similar to the proposed project.

Hazards and Hazardous Materials. The No Project Alternative would result in less ground disturbance and less construction in the project area. Therefore, the alternative would result in fewer construction impacts associated with the use and transport of hazardous materials, including fuels, oils, lubricants, asphalt products, other petroleum products, and solvents. Therefore, impacts related to hazardous materials would be reduced under the No Project Alternative when compared to the proposed project.

Hydrology and Water Quality. Implementation of the No Project Alternative would include periodic maintenance activities to repair damaged sections of the roadway. While the repair activities would be of lesser magnitude than the construction activities associated with the proposed project, the No Project Alternative, like the proposed project, would result in some soil erosion, the release of construction-related hazardous materials, and the emissions of other pollutants that could degrade water quality. Under the No Project Alternative, drainage improvements, such as bio-retention areas would not be installed; therefore, the No Project Alternative would not improve storm water quality.

Land Use and Planning Policy. With the No Project Alternative, the project area would continue to contain the roadway, commercial, and residential uses consistent with the land use designations outlined in the Marin CWP. However, the No Project Alternative would not improve roadway conditions to accommodate existing and future projected traffic volumes nor provide improvements related to pedestrian and bicycle safety and accessibility. As described in Section 4.12, by 2020 the SFDB corridor is anticipated to have portions where travel speed will drop below 10 mph, which is deemed unsatisfactory by County standards. As such, the No Project Alternative would not be consistent with applicable County and local land use and planning policies.

Noise. The No Project Alternative would result in less ground disturbance and less construction in the project area, foregoing the need for nighttime construction work. Therefore, the alternative is expected to result in fewer construction impacts associated with short-term increases in noise for sensitive receptors in the project area. As described in Section 4.10, under existing conditions, noise levels on SFDB exceed normally acceptable levels for residential uses. These conditions would continue under the No Project Alternative. Therefore, operational noise impacts related to noise would be the same as existing conditions for the No Project Alternative.

Public Services and Recreation. The No Project Alternative would result in only periodic maintenance activities in the project area, and would not increase demand for public services, including police and fire services. Similar to the proposed project, the alternative would not require the construction of new police and fire department facilities in order to maintain acceptable emergency response times. No new recreation facilities would be needed to accommodate the No Project Alternative. Therefore, impacts to public service and recreation under the No Project Alternative would be similar to the proposed project in that no significant impacts would occur.

Traffic and Circulation. The No Project Alternative would generate a small number of trips to the project site and would create temporary traffic delays and safety concerns during periodic maintenance and repair activities. While avoiding transportation-related impacts associated with construction of the project, this alternative would create periodic disruptions of traffic whenever maintenance and repair activities are performed. In addition, the No Project Alternative would not

achieve any of the project benefits associated with improved traffic flow, reduced congestion, or improved safety and accessibility for alternative modes, including pedestrians and bicyclists. As described in Section 4.12, while the SFDB corridor currently operates at satisfactory LOS in the existing condition, by 2020, delay is expected to grow at several intersections to levels deemed unsatisfactory by County standards. As such, the No Project Alternative would result in greater traffic impacts than the proposed project because it would not improve traffic conditions throughout the corridor.

Utilities and Service Systems. The No Project Alternative would result in only periodic maintenance activities in the project area, and would not increase demand for utilities or other service systems. Minor disruptions to utility services may occur during maintenance activities. Therefore, impacts to utilities and service systems under the No Project Alternative would be similar to the proposed project in that no significant impacts would occur.

5.2 GENERAL MAINTENANCE ALTERNATIVE

5.2.1 Principal Characteristics

The General Maintenance Alternative would implement proposed roadway improvements to improve pavement conditions, comply with current accessibility standards, and accommodate future adaptive signal technology. This alternative would replace the MMWD water pipeline to improve system reliability. The following improvements would be implemented:

- **Pavement Rehabilitation.** The project would fix damaged pavement, mill the surface, and place an asphalt overlay on the roadway between Ross and Highway 101.

- **Roadway Striping.** This alternative would restripe the roadway to match the existing roadway configuration except at Wolfe Grade where striping would be modified to add the at-grade crosswalk.

- **Accessibility Improvements.** In conjunction with the asphalt repair, the project would update curb ramps at intersections to comply with the Americans with Disabilities Act[208]. This alternative would install an at-grade crosswalk at the west side of the Wolfe Grade intersection. To maintain existing traffic capacity through the intersection, this alternative would widen the sidewalk thereby reducing the width of the street crossing, minimizing the time required for pedestrians to cross the street thus not reducing the intersection's traffic capacity. Other pedestrian safety improvements would include conventional right turn lanes creating a more standardized intersection configuration.

- **Guardrail Replacement.** As part of the pavement rehabilitation, the metal beam guardrail would be removed and a new cable fence would be installed from Eliseo Drive to Wolfe Grade.

[208] The Americans with Disabilities Act of 1990 (ADA) is a federal law that prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation. In 2013, the Departments of Justice and Transportation issued directive that requires agencies to provide curb ramps when streets, roads, and highways are altered through resurfacing.

- **Signal Timing.** This improvement would update traffic signal timing to meet current standards for vehicles, pedestrians, and bicycles.

- **Future Adaptive Infrastructure Accommodation.** This improvement would install conduits, pull boxes, fiber optic cable, and Ethernet switches to interconnect the signals allowing for the future implementation of an adaptive traffic signal system along the length of the road.

- **Pipeline Replacement.** In this alternative, a total of 8,000-feet of existing 12-inch cast iron and 14-inch steel potable water pipeline would be replaced with 12-inch and 18-inch welded steel pipe between Ross Terrace to Manor Road and Barry Way to the west side of Caltrans Highway 101 right-of-way.

In this alternative, roadway and intersection modifications (e.g., additional third lane) would not be constructed; therefore, vehicle travel times through the corridor would not decrease. Several of the pedestrian and bicycle improvements, including the shared use path between Eliseo Drive and Bon Air Road, would not be implemented.

The General Maintenance Alternative would partially achieve the project objectives. Under the General Maintenance Alternative, several of the public benefits of the proposed project – improved traffic flow/reduced congestion, and enhanced pedstrian/bicycle/transit facilities – would not be fully achieved. This alternative would fulfill the 'repair pavement' objective by extending the design life of the roadway to 20 years and the 'upgrade MMWD pipelines' objective by improving the reliability of the water system. Additional improvements would be implemented to comply with ADA requirements, and improve the safety for pedestrians at certain intersections within the project corridor.

5.2.2 Analysis of the General Maintenance Alternative

The General Maintenance Alternative is evaluated for all environmental topics analyzed in this Draft EIR with the exception of: air quality; global climate change; hazards and hazardous materials; land use and planning policy; noise; public services; and utilities and service systems. The impacts associated with these excluded topics would be essentially the same as those that would result from implementation of the proposed project.

Aesthetics. Similar to the No Project Alternative, the General Maintenance Alternative would not change existing land uses on the project site or alter the visual character of the area because trees would not be removed, retaining walls would not be installed/replaced, and limited intersection modifications would be constructed. Construction would be conducted entirely within the limits of the existing roadway. In this alternative, the visual character of the project area would benefit from improvements to the roadway surface associated with replacement of the degraded pavement. Similar to the proposed project, construction of the General Maintenance would require nighttime lighting, which would create impacts associated with nighttime light and glare. Implementation of mitigation measures identified in Section 4.1 would reduce potential impacts associated with nighttime lighting during construction to a less-than-significant level.

Biological Resources. Under the General Maintenance Alternative, construction would be conducted entirely within the limits of the existing roadway. Even so, construction-related impacts to sensitive plant and animal communities and associated habitats would be similar to the proposed project in that grading and earthmoving to rehabilitate the roadway pavement could contribute sediment and other pollutants into Wolfe Grade Creek thereby affecting the quality of spawning and rearing habitat for salmonids and other aquatic organisms downstream. With implementation of the mitigation measures described in Section 4.3, Biological Resources, potential impacts to biological resources would be reduced to a less-than-significant level.

Tree removal associated with the College Avenue Intersection improvements and the Bacich Elementary School Frontage improvements would not be required, thereby reducing impacts to nesting birds and protected trees. In addition, the potentially jurisdictional ditch located east of La Cuesta Drive and north of SFDB would be avoided with this alternative. Therefore, impacts to biological resources would be reduced under the General Maintenance Alternative.

Cultural Resources. In the General Maintenance Alternative, ground disturbance would be limited within the existing roadway right-of-way, as no roadway widening would occur, thereby requiring less ground disturbance than the proposed project. However, as described in Section 4.4, three pre-contact archaeological sites are located within 500 feet of the project site. Similar to the proposed project, pavement replacement in the General Maintenance Alternative would require excavation that could unearth intact archaeological deposits and/or human remains. With implementation of the mitigation measures for unanticipated discoveries described in Section 4.4, Cultural Resources, potential impacts to cultural resources would be reduced to a less-than-significant level.

Geology and Soils. In the General Maintenance Alternative, the project site would continue to be subject to seismic hazards, erosion, landslides, and soil deformation and movement. Since, the General Maintenance Alternative would not include pedestrian improvements (e.g., sidewalk widening), retaining walls would not need to be extended and/or replaced; therefore, mitigation measures to ensure appropriate design of such facilities would not be required.

Hazards and Hazardous Materials. The General Maintenance Alternative would result in less ground disturbance and construction in the project area. Therefore, this alternative is expected to result in fewer construction impacts associated with the use and transport of hazardous materials, including fuels, oils, lubricants, asphalt products, other petroleum products, and solvents. Although the potential for encountering groundwater would be less as the depth of excavation would be reduced, excavation for this alternative could encounter residual groundwater contamination associated with existing hazardous materials sites. Implementation of the mitigation measures identified in Section 4.7 would reduce potential impacts associated with groundwater contamination to less than significant. Overall, under the General Maintenance Alternative, impacts related to hazards and hazardous materials would be similar to the proposed project.

Hydrology and Water Quality. While proposed improvement would be of lesser magnitude than the construction activities associated with the proposed project, the General Maintenance Alternative, like the proposed project, would result in some soil erosion and the release of construction-related hazardous materials and the emissions of other pollutants that could degrade water quality. However, compliance with the NPDES Construction General Permit, which requires preparing and

implementing a SWPPP that includes BMPs to prevent the degradation of stormwater quality, would ensure that stormwater discharges during project construction would have a less-than-significant impact on water quality. In the General Maintenance Alternative, drainage improvements, such as bio-retention areas would not be installed. Overall, with the General Maintenance Alternative, impacts to hydrology and water quality would be similar to the proposed project.

Land Use and Planning Policy. With the General Maintenance Alternative, the project area would continue to contain the roadway, commercial, and residential uses consistent with the land use designations outlined in the Marin CWP. Like the No Project Alternative, the General Maintenance Alternative would not provide congestion relief for future projected traffic volumes. As described in Section 4.12, by 2020, the SFDB corridor is anticipated to have portions where travel times would be unsatisfactory by County standards. As such, the General Maintenance Alternative would not be consistent with applicable County and local land use and planning policies.

Noise. The General Maintenance Alternative would result in less ground disturbance and less construction in the project area. However, proposed improvements would be located in proximity to sensitive receptors, including single-family residences, multi-family housing, Bacich Elementary School, Kent Middle School, Marin Catholic High School, College of Marin, and Marin General Hospital. Therefore, construction impacts associated with short-term increases in noise for sensitive receptors in the project area in this alternative would be similar to the proposed project. The General Maintenance Alternative would not generate additional vehicle trips that would contribute to existing noise levels along SFDB. Therefore, operational noise impacts associated with this alternative would be less than significant. Overall, under the General Maintenance Alternative, impacts related to noise would be similar to the proposed project.

Traffic and Circulation. Like the proposed project, construction activities associated with the General Maintenance Alternative, such as lane closures, would have the potential to reduce travel speed through the corridor to unsatisfactory levels during the construction period. With implementation of the mitigation measures described in Section 4.12, Traffic and Circulation, potential traffic impacts due to construction would be reduced to a less-than-significant level. Implementation of the General Maintenance Alternative would improve the conditions of the roadway pavement; however, it would not achieve congestion relief. As described in Section 4.12, while the SFDB corridor operates at satisfactory LOS in the existing condition, by 2020, delay is expected to grow at several intersections to levels deemed unsatisfactory by County standards. While the General Maintenance Alternative would provide some improvements to the Wolfe Grade intersection, it would not implement the improvements necessary to accommodate future traffic flow, such that traffic times could meet County standards. Therefore, the General Maintenance Alternative would result in greater traffic impacts than the proposed project.

5.3 CONGESTION RELIEF ALTERNATIVE

5.3.1 Principal Characteristics

The Congestion Relief Alternative would implement proposed roadway intersection modifications to improve efficiency and reduce vehicle travel times along the project corridor. As part of this alternative, the following improvements would be implemented:

- **Additional Third Lane between El Portal Drive and Highway 101.** In this alternative, some of the curbs would be shifted to the south and the road would be striped to include an eastbound third lane from El Portal Drive to Highway 101.

- **Signal Technology Modifications.** This alternative would install new traffic signal controllers as well as poles, mast arms, and signal faces in all signalized intersections between College Avenue and Eliseo Drive using the latest technology available, as well as conduits, pull boxes, fiber optic cable, and Ethernet switches to interconnect the signals allowing for the future implementation of an adaptive traffic signal system. Elm Avenue would install a partial replacement of the traffic signal, and upgrades to the signal would still include controller infrastructure replacement and signal retiming.

- **Eliseo Drive Intersection Improvements.** This alternative would modify the lane configuration on the north side of the intersection allowing for simultaneous left turn movements from both the north and south bound approaches to SFDB, requiring the median on the north side of the intersection to be shifted to the east. Additional modifications at the intersection would include adjustment to allow for the third eastbound travel lane, relocation of the north side crosswalk, and modification of the driveway entrance to Bon Air Shopping Center from Barry Way.

- **La Cuesta Drive Intersection.** Like the Eliseo Drive intersection improvements, the alternative would modify the intersection configuration to allow for simultaneous left turn operation, including converting to conventional right turn lanes and reconfiguration as a standard intersection.

- **El Portal Drive Intersection.** The alternative would convert the right turn lanes on the south side of the intersection to conventional intersection configuration and provide accessible curb ramps at all crossings.

- **Bon Air Road Intersection.** The south side right turn lanes would be converted to conventional configurations, the sidewalks would be widened and the crosswalk would be relocated from the east side to the west side of SFDB. Additionally, the traffic signal phasing and pole locations would be modified to accommodate the new layout.

- **College Avenue Intersection.** This alternative would provide dual left turn pockets to accommodate the volume of vehicles, reducing backup into the through travel lanes, and reducing congestion in the intersection. To accommodate the second left turn lane and to maintain the existing number of on-street parking stalls along SFDB, up to four (4) trees would be removed along the north side of the road.

Except in locations where re-paving would be necessary to accommodate proposed intersection modifications, the roadway would not be rehabilitated. The County would continue to maintain and repair the roadway on an as-needed and ad hoc basis.

The existing MMWD waterline would not be replaced as part of this alternative. As described in Chapter 3.0, Project Description, the existing cast iron pipe is reaching the end of its useful life and

has experienced numerous breaks in recent years. Under the Congestion Relief Alternative, MMWD would initiate a separate, independent pipeline replacement project.

The Congestion Relief Alternative would only partially achieve the project objectives. Under the Reduced Congestion Alternative, several of the public benefits of the proposed project – improved pedestrian crossing safety, closure of sidewalk gaps, improved transit access and improved bicycle access – would not be achieved. Further, this alternative would not fulfill the 'repair pavement' objective or the 'upgade MMWD pipelines' objective. The Congestion Relief Alternative would acheve the 'improve traffic flow and reduce congestion" objective by adding a third travel lane and implementing intersection improvements to improve roadway efficiency and reduce travel time.

5.3.2 Analysis of the Congestion Relief Alternative

The Congestion Relief Alternative is evaluated for all environmental topics analyzed in this Draft EIR with the exception of: air quality; global climate change; hazards and hazardous materials; noise; public services; traffic and circulation; and utilities and service systems. The impacts associated with these excluded topics would be essentially the same as those that would result from implementation of the proposed project.

Aesthetics. Implementation of the Congestion Relief Alternative would result in limited tree removal, the addition of a third lane between El Portal Drive and Highway 101 and various modifications to existing roadway intersections along the project corridor. Similar to the proposed project, these visual changes would be consistent with the existing visual character of the project site, which is a developed, urban roadway corridor. Because pavement rehabilitation would be limited with this alternative, the project corridor would not benefit from improving the roadway surface by replacing the degraded pavement. Construction of the Congestion Relief Alternative would require nighttime lighting, with associated nighttime light and glare impacts. Implementation of mitigation measures identified in Section 4.1 would reduce potential impacts associated with nighttime lighting during construction to a less-than-significant level.

Biological Resources. Similar to the proposed project, the Congestion Relief Alternative would have the potential to cause indirect impacts to salmonids and other aquatic species as a result of construction-related activities such as grading, tree removal, construction equipment operation and storage of fuels and other materials. In addition, the Congestion Relief Alternative may impact up to 2,000 square feet of riparian vegetation associated with Wolfe Grade Creek at the intersection of SFDB and McAllister Avenue, could impact approximately 45 square feet of a potentially jurisdictional roadside seasonal wetland ditch located northeast of the La Cuesta Drive/SFDB intersection, and would require removal of 4 trees associated with the College Avenue intersection improvements, which could impact nesting birds. These impacts are similar to the proposed project. With implementation of the mitigation measures described in Section 4.3, Biological Resources, potential impacts to biological resources would be reduced to a less-than-significant level.

Cultural Resources. Similar to the proposed project, roadway widening and intersection reconfiguration proposed as part of the Congestion Relief Alternative would require excavation that could unearth intact archaeological deposits and/or human remains. With implementation of the

mitigation measures described in Section 4.4, Cultural Resources, potential impacts to cultural resources would be reduced to a less-than-significant level.

Geology and Soils. Under the Congestion Relief Alternative, the project site would continue to be subject to seismic hazards, erosion, landslides, and soil deformation and movement. Since, the General Maintenance Alternative would not include pedestrian improvements (e.g., sidewalk widening), retaining walls would not need to be extended and/or replaced; therefore, mitigation measures to ensure appropriate design of such facilities would not be required.

Hydrology and Water Quality. Like the proposed project, construction activities and operation of the proposed roadway under the Congestion Relief Alternative could generate stormwater runoff that could cause or contribute to a violation of water quality standards or waste discharge requirements or otherwise degrade the water quality of Wolfe Grade Creek and other adjacent drainages. However, compliance with the NPDES Construction General Permit, which requires preparing and implementing a SWPPP that includes BMPs to prevent the degradation of stormwater quality, would ensure that stormwater discharges during project construction would have a less-than-significant impact on water quality. In addition, the Congestion Relief Alternative would include reconfiguration of SFDB intersections at La Cuesta Drive and El Portal Drive; therefore, landscape features to improve site drainage (e.g., bioretention areas and pervious pavement) would also be installed as part of this alternative.

Land Use and Planning Policy. Similar to the proposed project, with the Congestion Relief Alternative the project area would continue to contain the roadway, commercial, and residential uses consistent with the land use designation outlined in the Marin CWP. Like the proposed project, implementation of the Congestion Relief Alternative would improve traffic flow such that under future conditions, travel speeds through the corridor would be consistent with Marin County standards. Therefore, the Congestion Relief Alternative would be consistent with local land use and planning policies.

Cumulative Impacts. While the construction-related impacts associated with the Congestion Relief Alternative would be reduced compared to the proposed project, these impacts may be cumulatively considerable when combined with other foreseeable projects, namely the replacement of the MMWD water pipeline. As described in Chapter 3.0, Project Description, the existing cast iron pipe is reaching the end of its useful life and has experienced numerous breaks in recent years. In the Congestion Relief Alternative, MMWD would initiate a separate, independent pipeline replacement project that would likely be constructed immediately prior to the SFDB Rehabilitation Project. The result of these two projects being constructed separately, rather than concurrently as with the proposed project, would be an extended construction period, resulting in increased traffic delays along the SFDB corridor, increased trips for construction equipment and workers to the project site, an associated increase in air emissions, and an extended period of construction noise for nearby sensitive receivers. Other cumulative impacts would be similar to the proposed project.

5.4 CORRIDOR PEDESTRIAN AND BICYCLE IMPROVEMENTS ALTERNATIVE

5.4.1 Principal Characteristics

The Corridor Pedestrian and Bicycle Improvements Alternative would implement proposed improvements to enhance the safety of the project corridor for pedestrians and bicyclists. As part of this alternative, the following improvements would be implemented:

- **Providing a shared use path along the north side of Sir Francis Drake Boulevard between Eliseo Drive and Bon Air Road.** Along the north side of SFDB, this alternative would install a concrete sidewalk with a minimum width of 8 feet. The project would remove the existing metal beam guardrail to be replaced with a cable-type fence.

- **Bacich Elementary School Frontage.** The sidewalk on the south side of SFDB would be widened between East McAllister Avenue and Wolfe Grade.

- **Marin Catholic High School Frontage.** This alternative would provide continuous sidewalk along the south side of SFDB between Wolfe Grade and Bon Air Road. In addition, the driveway exit from Marin Catholic High School would be reconfigured to increase the visibility of pedestrians and to reduce the speed of exiting traffic.

- **Manor Road Improvements.** This alternative would provide safety improvements at Manor Road by improving motorists' sight distance of pedestrians as they approach the crosswalk by both horizontally and vertically re-aligning the sidewalk and intersection.

This alternative would also include safety improvements at several intersections with SFDB including Elm, Ash, West McAllister, and Laurel Grove Avenues. Such improvements would include right turn lanes converting to conventional configurations, sidewalk widening, installation of rectangular rapid flashing beacons or a HAWK-type beacon and a high visibility crosswalk at Ash Avenue, and relocation of the transit stop at Elm Avenue.

In the Corridor Pedestrian and Bicycle Improvements Alternative, the roadway design life would not be extended. MMWD would initiate a separate, independent pipeline replacement project. This alternative would not reconfigure the intersections to operate more efficiently, thereby vehicle travel times through the corridor would not decrease.

Although some impacts associated with construction would be reduced or avoided due to the reduced area of construction, the Corridor Pedestrian and Bicycle Improvements Alternative would not achieve the project objectives of pavement repair, congestion relief, or improved utilities.

5.4.2 Analysis of the Corridor Pedestrian and Bicycle Improvements Alternative

The Corridor Pedestrian and Bicycle Improvements Alternative is evaluated for all environmental topics analyzed in this Draft EIR with the exception of: geology and soils; hazards and hazardous materials; noise; public services; and utilities and service systems. The impacts associated with these excluded topics would be essentially the same as those that would result from implementation of the proposed project.

Aesthetics. Implementation of the Corridor Pedestrian and Bicycle Improvements Alternative would result in limited tree removal, installation/widening of sidewalks, replacement of the existing metal beam guardrail with a cable-type fence, and some intersection modifications. Similar to the proposed project, these visual changes would be consistent with the existing visual character of the project site, which is a developed, urban roadway corridor. Because pavement rehabilitation would be limited with this alternative, the project corridor would not benefit from improvements to the roadway surface associated with replacing the degraded pavement. Therefore, impacts related to aesthetics under the Corridor Pedestrian and Bicycle Improvements Alternative would be similar to the proposed project.

Air Quality. Implementation of the Corridor Pedestrian and Bicycle Improvements Alternative would result in less ground disturbance than the proposed project; however, implementation of this alternative would still require grading and construction activities and would generate additional trips to the project site. While the proposed improvements would be of lesser magnitude than the construction activities proposed as part of the project, the Corridor Pedestrian and Bicycle Improvements Alternative, like the proposed project, would result in air quality impacts during construction, namely emissions of toxic gases and particulate matter. With implementation of the mitigation measures identified in Section 4.2, these impacts would be reduced to less than significant. Therefore, impacts related to air quality under the Corridor Pedestrian and Bicycle Improvements Alternative would be similar to the proposed project.

Biological Resources. In the Corridor Pedestrian and Bicycle Improvements Alternative, construction-related impacts to sensitive plant and animal communities and associated habitats would be similar to the proposed project, in that grading and earthmoving to accommodate proposed improvements could contribute sediment and other pollutants into Wolfe Grade Creek thereby affecting the quality of spawning and rearing habitat for salmonids and other aquatic organisms downstream. In addition, tree removal would be required to accommodate the proposed Bacich Elementary School Frontage Improvements. With implementation of the mitigation measures described in Section 4.3, Biological Resources, potential impacts to biological resources would be reduced to a less-than-significant level. The potentially jurisdictional ditch located east of La Cuesta Drive and north of SFDB would be avoided under this alternative. Therefore, impacts to biological resources would be slightly reduced under the Corridor Pedestrian and Bicycle Improvements Alternative.

Cultural Resources. The Corridor Pedestrian and Bicycle Improvements Alternative would require less ground disturbance than the proposed project; however, ground disturbing activities would occur beyond the limits of the existing roadway. As described in Section 4.4, three pre-contact archaeological sites are located within 500 feet of the project. Similar to the proposed project, ground-disturbing activities in the Corridor Pedestrian and Bicycle Improvements Alternative could unearth intact archaeological deposits and/or human remains. With implementation of the mitigation measures for unanticipated discoveries described in Section 4.4, Cultural Resources, potential impacts to cultural resources would be reduced to a less-than-significant level. Therefore, impacts to cultural resources under the Corridor Pedestrian and Bicycle Improvements Alternative would be similar to the proposed project.

Global Climate Change. Implementation of the Corridor Pedestrian and Bicycle Improvements Alternative would result in less ground disturbance than the proposed project; however, implementation of this alternative would still require grading and construction activities and would generate additional trips to the project site. While the proposed improvements would be of lesser magnitude than the construction activities proposed as part of the project, the Corridor Pedestrian and Bicycle Improvements Alternative, like the proposed project, would result in global climate change impacts, namely generation of substantial GHG emissions associated with project construction. With implementation of the mitigation measures identified in Section 4.6, these impacts would be reduced to less than significant.

Hazards and Hazardous Materials. The Corridor Pedestrian and Bicycle Improvements Alternative would result in less ground disturbance and construction in the project area. Therefore, this alternative is expected to result in fewer construction impacts associated with the use and transport of hazardous materials, including fuels, oils, lubricants, asphalt products, other petroleum products, and solvents. However, excavation for this alternative could encounter residual groundwater contamination associated with existing hazardous material sites; although the potential for encountering groundwater would be less as the depth of excavation would be reduced. Implementation of the mitigation measures identified in Section 4.7 would reduce potential impacts associated with groundwater contamination to less than significant. Overall, under the Corridor Pedestrian and Bicycle Improvements Alternative, impacts related to hazards and hazardous materials would be similar to the proposed project.

Hydrology and Water Quality. While proposed improvements would be of lesser magnitude than the construction activities associated with the proposed project; the Corridor Pedestrian and Bicycle Improvements Alternative, like the proposed project, would result in some soil erosion and the release of construction-related hazardous materials and the emissions of other pollutants that could degrade water quality. However, compliance with the NPDES Construction General Permit, which requires preparing and implementing a SWPPP that includes BMPs to prevent the degradation of stormwater quality, would ensure that stormwater discharges during project construction would have a less-than-significant impact on water quality. Under the Corridor Pedestrian and Bicycle Improvements Alternative, drainage improvements, such as bio-retention areas would not be installed.

Land Use and Planning Policy. The Corridor Pedestrian and Bicycle Improvements Alternative would result in no land use changes to the project area. The project area would continue to contain the roadway, commercial, and residential uses consistent with the land use designations outlined in the Marin CWP. Consistent with policies identified in the Marin CWP, the Corridor Pedestrian and Bicycle Alternative would improve safety and accessibility along the project corridor for alternative modes, including pedestrians and bicyclists. However, the Corridor Pedestrian and Bicycle Alternative would not provide congestion relief for future projected traffic volumes, as described for the No Project and General Maintenance Alternatives.

Noise. The Corridor Pedestrian and Bicycle Alternative would result in less ground disturbance and construction in the project area. However, proposed improvements would be located in proximity to sensitive receptors, including single-family residences, multi-family housing, Bacich Elementary School, Kent Middle School, Marin Catholic High School, College of Marin, and Marin General

Hospital. Therefore, construction impacts associated with short-term increases in noise for sensitive receptors in the project area with this alternative would be similar to the proposed project. The Corridor Pedestrian and Bicycle Improvements Alternative would not generate additional vehicle trips that would contribute to existing noise levels along SFDB. Therefore, operational noise impacts associated with this alternative would be less than significant. Overall, in the Corridor Pedestrian and Bicycle Improvements Alternative, impacts related to noise would be similar to the proposed project.

Traffic and Circulation. Because proposed improvements would be less extensive than the proposed project, traffic impacts due to construction activities would likely be reduced and mitigation measures to reduce such impacts may not be required. Implementation of the Corridor Pedestrian and Bicycle Improvements Alternative would improve safety and accessibility for bicyclists and pedestrians along the project corridor; however, it would not achieve congestion relief or pavement rehabilitation. As described in Section 4.12, while the SFDB corridor operates at satisfactory LOS in the existing condition, by 2020, delay is expected to grow at several intersections to levels deemed unsatisfactory by County standards. As such, the Corridor Pedestrian and Bicycle Alternative would result in greater traffic impacts than the proposed project because it would not improve traffic conditions throughout the corridor.

Cumulative Impacts. While the construction-related impacts associated with the Corridor Pedestrian and Bicycle Improvements Alternative would be reduced compared to the proposed project, these impacts may be cumulatively considerable when combined with other foreseeable projects, namely the replacement of the MMWD water pipeline. As described in Chapter 3.0, Project Description, the existing cast iron pipe is reaching the end of its useful life and has experienced numerous breaks in recent years. Under the Corridor Pedestrian and Bicycle Improvements, MMWD would initiate a separate, independent pipeline replacement project that would likely be constructed immediately prior to the SFDB Rehabilitation Project. The result of these two projects being constructed separately, rather than concurrently as with the proposed project, would be an extended construction period, resulting in increased traffic delays along the SFDB corridor, increased trips for construction equipment and workers to the project site, an associated increase in air emissions, and an extended period of construction noise for nearby sensitive receivers. Other cumulative impacts would be similar to the proposed project.

5.5 NO PIPELINE ALTERNATIVE

5.5.1 Principal Characteristics

Under the No Pipeline Alternative, the MMWD pipeline would not be replaced in order to minimize the environmental impacts associated with pipeline installation. All of the roadway improvements as described in Section 3.5.1, 3.5.2, and 3.5.3 would be implemented including:

- Roadway pavement rehabilitation within the project limits.
- Intersection geometry modifications, including adding or reconfiguring turn lanes as well as removal or relocation of medians.

- Modernization of traffic signal equipment, including revisions to traffic phasing timing, and improved synchronization along the corridor.
- Installation of conduits and related appurtenances for a future adaptive traffic signal system and a broadband communication network.
- Revised striping and signage designed to improve safety for motorists, pedestrians, and bicyclists. Sidewalk widening and crosswalk enhancements designed to improve pedestrian safety and access.
- Accessibility improvements in compliance with the Americans with Disabilities Act (ADA).
- Installation of drainage improvements to accommodate intersection revisions.
- Replacement of landscaping and irrigation systems disrupted by the project.

With the No Pipeline Alternative, construction would require a shorter construction period than would be required for the proposed project, thereby reducing construction-related impacts to air quality, noise and traffic. Further, the depth of excavation required for the No Pipeline Alternative would be reduced as the pipeline would require excavation between four and seven feet deep; while the depth of excavation for the roadway improvements alone would be between 12 and 36 inches.

The No Pipeline Alternative would achieve all but one of the project objectives. Implementation of the No Pipeline Alternative would not fulfill the objective to implement utility improvments as part of a comprehensive approach to the corridor. . All other project objectives would be fulfilled.

5.5.2 Analysis of the No Pipeline Alternative

The No Pipeline Alternative is evaluated for all environmental topics analyzed in this Draft EIR with the exception of: biological resources; geology and soils; land use and planning policy; public services; and utilities and service systems. The impacts associated with these excluded topics would be essentially the same as those that would result from implementation of the proposed project.

Aesthetics. Because the proposed pipeline would be located underground and out of sight following construction, removal of this element from the proposed project would have no effect on the visual impacts associated with the proposed project. The No Pipeline Alternative would result in limited tree removal, the addition of a third lane between El Portal Drive and Highway 101, modifications to existing intersection along the project corridor, pavement rehabilitation, and installation of various pedestrian and bicycle improvements (e.g., sidewalks). Similar to the proposed project, these visual changes would be consistent with the existing visual character of the project site, which is a developed, urban roadway corridor. Further, construction of the No Pipeline Alternative would require nighttime lighting, creating impacts associated with nighttime light and glare. Implementation of mitigation measures identified in Section 4.1 would reduce potential impacts associated with nighttime lighting during construction to a less-than-significant level. Therefore, aesthetics impacts of the No Pipeline Alternative would be similar to the proposed project.

Air Quality. Implementation of the No Pipeline Alternative would result in less ground disturbance than the proposed project because the depth of excavation required for proposed roadway improvements would be limited to between 12 and 36 inches, thereby reducing the number of truck trips needed to off-haul spoils from trench excavation and the resulting air emissions associated with those truck trips. However, implementation of this alternative would still require grading and construction activities and would generate additional trips to the project site for project construction. While the proposed improvements would be of lesser magnitude than the construction activities proposed as part of the project, the No Pipeline Alternative, like the proposed project, would result in air quality impacts during construction, namely emissions of toxic gases and particulate matter. With implementation of the mitigation measures identified in Section 4.2, these impacts would be reduced to less than significant.

Cultural Resources. Implementation of the No Pipeline Alternative would result in less ground disturbance than the proposed project because the depth of excavation required for proposed roadway improvements would be limited to between 12 and 36 inches, thereby reducing the potential for encountering cultural or paleontological resources. However, implementation of this alternative would still require ground-disturbing activities that could unearth intact archaeological deposits and/or human remains. With implementation of the mitigation measures for unanticipated discoveries described in Section 4.4, Cultural Resources, potential impacts to cultural resources would be reduced to a less-than-significant level.

Global Climate Change. Implementation of the No Pipeline Alternative would result in less ground disturbance than the proposed project because the depth of excavation required for proposed roadway improvements would be limited to between 12 and 36 inches, thereby reducing the number of truck trips needed to off-haul spoils from trench excavation and the resulting GHG emissions associated with those truck trips. While the proposed improvements would be of lesser magnitude than the construction activities proposed as part of the project, the No Pipeline Alternative, like the proposed project, would result in global climate change impacts, namely generation of substantial GHG emissions associated with project construction. With implementation of the mitigation measures identified in Section 4.6, these impacts would be reduced to less than significant.

Hazards and Hazardous Materials. Implementation of the No Pipeline Alternative would result in less ground disturbance than the proposed project because the depth of excavation required for proposed roadway improvements would be limited to between 12 and 36 inches, thereby reducing the potential for encountering residual groundwater contamination as the depth of excavation for the roadway improvements would be limited. Therefore, mitigation related to storing, testing and managing potentially contaminated groundwater would not be required. Proposed improvements under the No Pipeline Alternative would require removal of yellow traffic stripe and pavement markings that potentially contain LBP. With implementation of the mitigation measures identified in Section 4.7, impacts associated with LBP would be reduced to less than significant.

Hydrology and Water Quality. Implementation of the No Pipeline Alternative would result in less ground disturbance than the proposed project because the depth of excavation required for proposed roadway improvements would be limited to between 12 and 36 inches, thereby reducing the potential for encountering residual groundwater contamination because the depth of

excavation would be limited. As a result, mitigation related to storing, testing and managing potentially contaminated groundwater would not be required. Like the proposed project, construction activities associated with the No Pipeline Alternative would result in some soil erosion and the release of construction-related hazardous materials and the emissions of other pollutants that could degrade water quality. However, compliance with the NPDES Construction General Permit, which requires preparing and implementing a SWPPP that includes BMPs to prevent the degradation of stormwater quality, would ensure that stormwater discharges during project construction would have a less-than-significant impact on water quality.

Noise. Implementation of the No Pipeline Alternative would result in less ground disturbance than the proposed project and require a shorter construction period, thereby minimizing the level of construction noise, as well as, limiting the exposure of sensitive noise receivers to construction noise impacts. While the proposed improvements would be of lesser magnitude than the construction activities proposed as part of the project, the No Pipeline Alternative, like the proposed project, would require construction activities that could increase short-term noise levels for sensitive receptors in the project area. With implementation of the mitigation measures identified in Section 4.9, these impacts would be reduced to less than significant. The No Pipeline Alternative would not generate additional vehicle trips that would contribute to existing noise levels along SFDB. Therefore, similar to the proposed project, operational noise impacts associated with this alternative would be less than significant.

Traffic and Circulation. Implementation of the No Pipeline Alternative would result in less ground disturbance than the proposed project and require a shorter construction period, thereby minimizing potential traffic delays due to construction and reducing the number of truck trips required to off-haul trench spoils. While the proposed improvements would be of lesser magnitude than the construction activities proposed as part of the project, the No Pipeline Alternative, like the proposed project, would require construction activities that could result in delays during the construction period. With implementation of the mitigation measures identified in Section 4.12, these impacts would be reduced to less than significant. Similar to the proposed project, the No Pipeline Alternative would include proposed improvements to provide congestion relief and reduce travel times through the project corridor.

Cumulative Impacts. While the construction-related impacts associated with the No Pipeline Alternative would be reduced compared to the proposed project, these impacts may be cumulatively considerable when combined with other foreseeable projects, namely the replacement of the MMWD water pipeline as a separate project. As described in Chapter 3.0, Project Description, the existing cast iron pipe is reaching the end of its useful life and has experienced numerous breaks in recent years. Under the No Pipeline Alternative, MMWD would initiate a separate, independent pipeline replacement project that would likely be constructed immediately prior to the SFDB Rehabilitation Project. The result of these two projects being constructed separately, rather than concurrently as with the proposed project, would be an extended construction period, resulting in increased traffic delays along the SFDB corridor, increased trips for construction equipment and workers to the project site, an associated increase in air emissions, and an extended period of construction noise for nearby sensitive receivers. Other cumulative impacts would be similar to the proposed project.

5.6 ALTERNATIVES CONSIDERED BUT REJECTED FROM FURTHER CONSIDERATION

The following section describes two alternatives to the proposed project that were considered, but were rejected from further consideration for the reason(s) provided.

5.6.1 Off-Site Alternatives

The proposed project is intended to rehabilitate the existing deteriorated roadway conditions along the segment of SFDB in the project area; accordingly, no off-site alternatives were considered since there is no other existing roadway at this juncture with Highway 101 serving the project area.

5.6.2 On-Site Alternatives

The following on-site alternatives were considered but rejected from further consideration:

- **Excluding the College Avenue improvements**. In the current condition, traffic waiting to turn left from westbound SFDB to southbound College Avenue often backs up into the through lanes of SFDB. This back-up has resulted in a series of collisions on the westbound approach to College Avenue. Furthermore, it creates hazards for pedestrians crossing SFDB at Ash Avenue. Because the improvements to College Avenue improve safety for motorists, pedestrians, and bicyclists, the alternative to exclude the College Avenue improvements was rejected and these improvements have been included as part of the proposed project.

- **Excluding the Wolfe Grade intersection improvements**. The County must provide an accessible path of travel in the public right-of-way in compliance with the Americans with Disabilities Act. Currently, no at-grade crosswalks are provided at the intersection. The existing pedestrian overcrossing does not meet accessibility standards. Studies completed illustrate that adding ramps to the existing overcrossing would be expensive to construct, require additional right-of-way from adjacent properties, and occupy a significant sidewalk area. In rejecting this alternative, the proposed project features an at grade crosswalk, which reconfigures the intersection and traffic signal operations to improve efficiency and reduce vehicle delay.

- **Excluding the La Cuesta Drive intersection improvements.** The project must modify the intersection to facilitate the third eastbound travel lane to Highway 101. The modifications to the intersection include reconfiguring the right turn lanes to a conventional intersection, improving pedestrian safety while not reducing vehicle capacity. Finally, the re-assignment of travel lanes in the northbound and southbound approaches, to provide concurrent left-turn signal phasing, better balances the existing traffic using the intersection, resulting in a reduction in delay for all users, including those on SFDB.

- **Including the multi-use trail between Bon Air Road and Corta Comoda**. The construction of a widened sidewalk in this location would require extensive grading, tree removal, and the construction of retaining walls. As there was not significant community support for this element, the project enhances the pedestrian crossing at Bon Air Road, thereby directing bicyclists to the Corte Madera Creek Path.

- **Including an adaptive traffic signal system.** Adaptive traffic signal control systems excel at making real-time adjustments on corridors that have highly variable traffic events throughout the day. However, they cannot increase capacity past recurring oversaturated traffic conditions, like those that routinely occur during peak periods on Sir Francis Drake Boulevard. It is not the most effective use of project funds to invest in a full adaptive system at this time, particularly when those funds can be used for more effective operational enhancements at key intersection points along the corridor. The proposed project's plans to install conduit as the 'backbone' for a future adaptive communication system demonstrate a commitment to further improving traffic flow once the most effective traffic improvements are made (such as the intersection geometry improvements).

  Provision of an adaptive traffic signal system on Sir Francis Drake Boulevard would not significantly reduce delays for motorists during peak travel periods. Per the Marin County Civil Grand Jury June 2016 report titled, "The Sir Francis Drake Boulevard Project Deconstructed", adaptive signal control "has many more sensors and more advanced controllers [than those existing on Sir Francis Drake Blvd.] that can dynamically select among available programs according to the current traffic situation, rather than depending on scheduled settings. A full system is estimated to cost $3-4 million, but would be likely to provide only slight benefit over the control system in place. For congested periods since similar signal timing programs would run under either system; an adaptive system would be most effective during non-congested periods, and just before and after peak conditions. For maximum reliability of signal-to-signal communication, underground fiber optic cable is preferred. The current Project includes a plan to install conduits during construction that could later be used for fiber optic cables supporting adaptive signal technology. The Grand Jury believes that coordinated signaling has moderate cost and provides much of the benefit that more advanced systems can provide."

- **Including the south side sidewalk between El Portal Drive and Bon Air Road**. The installation of a sidewalk in this location would require extensive grading, tree removal, and the construction of retaining walls. As there was not significant community support for this element and the proposed project enhances the sidewalk on the north side of SFDB, this element on the south side of SFDB was deleted from the project.

- **Developing SFDB as a transit corridor**. Transit corridors include specific accommodations for facilities such as light rail, streetcar, or bus rapid transit (BRT) and promote a pedestrian scale of development in which walking and biking complement public transit. To develop SFDB as a transit corridor would require construction of additional pedestrian safety improvements, as well as roadway modifications (e.g., median transit lane) to reduce conflicts between buses and through traffic. Such improvements are beyond the scope of this project, which is intended to rehabilitate the existing roadway surface. Funding to study and implement improvements to SFDB originates through the Transportation Authority of Marin's Measure A program under Strategy 3 for major roads and related infrastructure. This funding is allocated for pavement repair and ADA improvements at study intersections. Although some transit improvements are proposed as part of the project (e.g., bus bypass lane at one intersection and the enhanced/relocated bus stop by the College of Marin), the project purpose is to improve the

condition of the existing roadway. Further, implementation of the transit improvements described above would likely be cost prohibitive.

5.7 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires the identification of the environmentally superior alternative in an EIR. The No Project alternative would eliminate most of the potentially significant impacts associated with the proposed project. The alternative would not result in significant ground-disturbing activities, new construction, or the development of new facilities at the project site, which would avoid the project's significant cultural resources, hazardous materials, and hydrology impacts. In addition, the No Project Alternative would maintain existing vegetation, including riparian and wetland habitat along the project corridor, which would avoid the project's significant biology impacts. However, while the No Project Alternative would be the environmentally superior alternative in the context of impact reduction, it would not meet the primary objectives of the project. As a result, the No Project Alternative would not extend the pavement design life, provide congestion relief, or improve safety and accessibility for alternative modes of travel (e.g., pedestrians, bicyclists).

The General Maintenance Alternative and the Corridor Pedestrian and Bicycle Improvements Alternative would require less ground disturbance than the proposed project, but would result in similar environmental impacts as the proposed project, with the exception of traffic. As described above, neither of these alternatives include improvements that would improve traffic flow through the corridor. Without these improvements, under future conditions, travel speed through the corridor will drop below 10 mph, which is deemed unsatisfactory by County standards.

As described in Section 5.5, the No Pipeline Alternative would require a shorter construction period and less excavation, thereby reducing construction-related impacts of the roadway rehabilitation. However, the cumulative impacts associated with this alternative would be greater than the proposed project because the MMWD pipeline replacement project would be constructed separately and the efficiencies associated with constructing the two projects concurrently would not be realized.

CEQA Guidelines Section 15126(e)(2) requires that an additional alternative be designated as the environmentally superior alternative, if the No Project Alternative is identified as the environmentally superior alternative. The environmental impacts and ability to meet the project objectives for both the Congestion Relief Alternative and the proposed project have been determined to be equivalent. Therefore, both of these alternatives are considered the secondary environmentally superior alternatives to the No Project Alternative.

6.0 CEQA REQUIRED ASSESSMENT CONCLUSIONS

As required by CEQA, this chapter discusses the following types of impacts that could result from implementation of the proposed project: growth-inducing impacts; significant irreversible changes; cumulative impacts; effects found not to be significant; and unavoidable significant effects.

6.1 GROWTH INDUCING IMPACTS

A project is considered growth-inducing if it would directly or indirectly foster substantial economic or population growth or the construction of additional housing.[209] Examples of projects likely to have significant growth-inducing impacts include extensions or expansion of infrastructure systems beyond what is needed to serve project-specific demand, and development of new residential subdivisions or industrial parks in areas that are currently only sparsely developed or are undeveloped. The project, which includes no housing development, would not directly induce population growth. As described below, the project is not expected to be substantially growth inducing, although it would improve roadway conditions and water infrastructure within this segment of SFDB.

The proposed project is the rehabilitation of an existing roadway. Proposed improvements would extend the life of the roadway up to 20 years and would improve roadway travel conditions by providing a more uniform travel surface and by implementing intersection and roadway modifications to improve traffic flow. In addition, the proposed project would install pedestrian and bicycle improvements to enhance the safety of the roadway for these users. As part of the proposed project, MMWD would replace a total of approximately 8,000-feet of existing 12-inch cast iron and 14-inch steel potable water pipeline with 12-inch and 18-inch welded steel pipe.

Although a third eastbound travel lane would be provided from El Portal Drive to Highway 101, additional traffic demand would not result from implementing the proposed project. The additional lane would accommodate existing traffic volumes in order to help relieve congestion during the peak periods. In conjunction with other proposed intersection modifications, the addition of the third eastbound travel lane would reduce travel times for vehicle traffic along the project corridor. The proposed project would include minor improvements in critical locations within this segment of SFDB. Proposed improvements would be limited in scope, confined within the existing roadway right-of-way, and would improve travel times through only a small section of the SFDB corridor. The project corridor is surrounded by existing urban development, with limited potential for future development or expansion, although some areas could be redeveloped. Because proposed roadway improvements would be limited, the proposed project would not be expected to substantially induce growth.

The proposed water line replacement would replace existing pipelines within the existing right-of-way to improve water pressure and flow as well as enhance the reliability of the water system. The proposed project would not provide additional major infrastructure or increase the capacity of the existing water system to accommodate new development nor would the project extend or expand

[209] *CEQA Guidelines*, 2009. Section 15126.2(d)

infrastructure or services to existing undeveloped areas in the vicinity of the roadway. Because the proposed water line would be installed to serve the existing water system, and not anticipated demand for future development around the project site, it would not substantially induce growth.
Unavoidable Significant Environmental Impacts

As described in Chapter 4.0, the proposed project would not result in any significant unavoidable impacts. Significant impacts have been identified in the following topical areas: aesthetics; biological resources; cultural resources; geology and soils; hydrology and water quality; hazards and hazardous materials; air quality; noise; and global climate change. However, these impacts can all be reduced to less-than-significant levels with implementation of the mitigation measures identified in this Draft EIR.

6.2 SIGNIFICANT IRREVERSIBLE CHANGES

CEQA requires that EIRs assess whether the project would result in significant irreversible changes to the physical environment. The *CEQA Guidelines* discuss three categories of significant irreversible changes that should be considered. Each category is discussed below.

6.2.1 Changes in Land Use which Commit Future Generations

Implementation of the proposed project would entail rehabilitation of an existing roadway within the Marin County right-of-way. No changes in existing land use would result from the project that would commit future generations.

6.2.2 Irreversible Damage from Environmental Accidents

No significant environmental damage, such as accidental spills or explosions of hazardous materials, is anticipated due to implementation of the proposed project. Construction activities associated with rehabilitation of the existing roadway would require the use of certain hazardous materials that are regulated and would be used in compliance with safe operation protocols. Such uses would not be of a scale that would risk an environmental accident of irreversible proportions. Compliance with federal, State, and local regulations, and the mitigation measures identified in Section 4.7 would reduce to a less-than-significant level the possibility that hazardous substances within the project area would cause significant environmental damage.

6.2.3 Consumption of Nonrenewable Resources

Consumption of nonrenewable resources includes conversion of agricultural lands, loss of access to mining reserves, and use of non-renewable energy sources. Implementation of the proposed project would not result in the loss of agricultural uses. Implementation of the proposed project would entail rehabilitation of an existing roadway within the Marin County right-of-way; therefore, valuable agricultural soils would not be lost through development of the project.

The project site does not contain significant mineral reserves. Therefore, implementation of the proposed project would not result in the loss of significant mineral resources.

Construction of the proposed project would require the use of energy to fuel grading vehicles, trucks, and other construction vehicles. All or most of this energy would be derived from non-renewable resources. Vehicles using the roadway would continue consume energy. However, approximately the same number of vehicles would utilize this road segment as in the current condition. Because the number of vehicles using the roadway would not be increased by the project and because there would be only a temporary net increase in fuel consumption during construction, the proposed project would not substantially deplete non-renewable fuel supplies.

6.3 CUMULATIVE IMPACTS

CEQA defines cumulative impacts as "two or more individual effects, which, when considered together, are considerable, or which can compound or increase other environmental impacts." Section 15130 of the *CEQA Guidelines* requires that an EIR evaluate potential environmental impacts that are individually limited, but cumulatively considerable. These impacts can result from the project alone, or together with other projects. The *CEQA Guidelines* state: "The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."[210]

The area relevant to the project's cumulative impacts varies depending on the environmental resource. For example, impacts related to geology and archaeological resources are generally site specific, while air and noise impacts can encompass larger areas. Those impacts that are site-specific or limited in their impact area would not compound impacts from past, present, or reasonably foreseeable projects beyond the immediate project area. Section 15130 of the *CEQA Guidelines* states that it is not necessary to address in detail the impacts from other projects: "[w]here a lead agency is examining a project with an incremental effect that is not 'cumulatively considerable' a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable."

6.3.1 Methodology

When evaluating cumulative impacts, CEQA requires the use of either a list of past, present, and probable future projects, including projects outside the control of the lead agency, or a summary of projections in an adopted planning document, or some reasonable combination of the two approaches.

The cumulative analysis of this EIR is consistent with Section 15130(b)(1) of the CEQA Guidelines as it is based on both a list of past, present and probable future development projects in the area (short-term cumulative development) and a summary of development projections. Cumulative impacts would most likely result from short-term and long-term development in the immediate vicinity of the Sir Francis Drake Boulevard Rehabilitation Project. Where appropriate, this EIR assesses the short-term and long-term cumulative impacts that would result from the project plus

[210] *CEQA Guidelines*, 2009. Section 15355

other projected development in the project vicinity. The following sections discuss the anticipated short-term and long-term development in the project vicinity.

Short-Term Development. Of the 108 projects listed, PROPDEV 51[211] identifies 13 projects in various stages of development within unincorporated Marin County and 5 within the City of Larkspur. Of these projects, four projects are under review, three have been approved, five are under construction, two have recently completed construction, and three have been withdrawn, denied or expired. A summary of proposed development in unincorporated Marin County and the City of Larkspur is shown in Tables 6.4.A and 6.4B, respectively.

Table 6.4.A: Summary of Proposed Development in Unincorporated Marin County

Type	Under Review	Approved	Under Construction	Construction Complete	Withdrawn/ Denied/Expired
Residential	344 units	50 units	38 units	31 units	10 units
Office	0	0	0	0	0
Retail	0	0	0	0	0
Industrial	0	133,540 sq ft	0	0	0
Other	57,071 sq ft	0	35,195 sq ft	0	0

Source: PROPDEV 51 (October 2016)

Table 6.4.B: Summary of Proposed Development in Larkspur

Type	Under Review	Approved	Under Construction	Construction Complete	Withdrawn/ Denied/Expired
Residential	0	0	174 units	82 units	0
Office	0	0	11,000 sq ft	0	0
Retail	0	0	0	0	0
Industrial	24,000 sq ft	0	0	0	0
Other	0	0	63,275 sq ft	0	0

Source: PROPDEV 51 (October 2016)

All of the projects in unincorporated Marin County are located quite distant from the project area (e.g., more than 5 miles). The five projects in the City of Larkspur ~~projects~~ are located in the project vicinity and could contribute traffic to SFDB. Several projects at the College of Marin could also contribute to cumulative impacts. These projects are described below.

[211] PROPDEV 51 is fifty-first in a series of surveys of proposed development projects in Marin County (including cities). The survey provides information on all projects that include at least five residential units or 5,000 square feet of commercial, industrial, or institutional space. PROPDEV 51 includes information such as location, project sponsor, acreage, zoning, square feet of improvements, and status of application. The information in PROPDEV is obtained from County planning staff and planning departments in Marin cities and towns through a survey conducted twice a year. Marin County Community Development Agency, October 2016. Available online at: https://www.marincounty.org/~/media/files/departments/cd/planning/currentplanning/publications/landuseplan/propdev/pd51_report.pdf

- The Child Care Study Center is an institutional facility located on the College of Marin campus at 1144 Magnolia Ave. Construction of this project has recently been completed. This project is located approximately 0.5 mile from the project site.

- The Larkspur Rose Garden Community Facilities Parcel Master Plan consists of a master plan for development of a community center and library on the 200 block of Doherty Drive in Larkspur. The master plan recommends a joint-use community facility of 20,000 to 24,000 square feet with associated parking and outdoor gathering spaces. This project is currently under review. This project is located approximately 0.7 mile from the project site.

- Drake's Cove is a proposed 23-unit planned development consisting of 13 single-family units and five duplexes. The project is located at 175 Sir Francis Drake Boulevard, approximately 0.5 mile from the project site. To date, 11 single-family units and eight multi-family units have been constructed. Building permits for the remaining units are under review or yet to be submitted.

- The Sanitary District Property is located at 2000 Larkspur Landing Circle in Larkspur. The applicant proposes to redevelop the abandoned sanitary plant as a mixed-use project. The project would entail development of a 63,273-square foot hotel/office complex and 126 residential units. The project would include 80 hotel rooms and 716 parking spaces. The Precise Development Plan, General Plan Amendment and Design Review have been approved. The project is located approximately 0.7 mile from the project site.

- The Rose Garden is located at 2 Ward Street in Larkspur. The applicant proposes to develop the currently industrial (nursery) site with 35 single-family and 50 multi-family residential units. Construction of this project is complete. The project is located approximately 1 mile from the project site.

- Using Measure B funds, the College of Marin proposes to replace the existing maintenance complex, located east of Kent Middle School adjacent to Corte Madera Creek. Construction of this project is anticipated to be completed in 2019.[212]

- Using Measure B funds, the College of Marin proposes to demolish the maintenance facilities along Kent Avenue. The demolition of these structures is anticipated to be completed by summer 2018.[213]

- The College of Marin proposes to renovate, demolish or construct new facilities at the Learning Resources Center, located on College Avenue south of SFDB. Proposed improvements are still being designed, with construction anticipated from May 2020 to December 2021.

[212] Gilbane, 2017. Roll-Up Schedule as of November 30, 2017. Available online at: http://measurebcom.org/wp-content/uploads/2017/12/COM-Schedule-11.30.17-Roll-Up.pdf (Accessed February 19, 2018).
[213] Ibid.

In addition, the following roadway and infrastructure projects were identified and considered in the analysis of cumulative conditions:

- The Richmond-San Rafael Bridge Access Improvements: The Bay Area Toll Authority (BATA) proposes improvements to the Richmond-San Rafael Bridge to reduce congestion on eastbound I-580 and provide a bicycle/pedestrian link between Marin and Contra Costa Counties.[214] As part of these improvements, the right shoulder would be converted to provide a third freeway lane from the SFDB on-ramp in Marin County to the Marine Street exit in Contra Costa County. In addition, a bicycle/pedestrian path would be established on the north side of I-580, including the upper deck of the Richmond-San Rafael Bridge, with concrete barriers to separate bicyclists and pedestrians from westbound freeway traffic. Construction of proposed improvements began in early 2017, with completion expected in late 2017.

- Access Improvements Approaching the Richmond-San Rafael Bridge – Project 2 - East Sir Francis Drake Boulevard:[215] In coordination with the Transportation Authority of Marin, the City of Larkspur proposes to implement vehicular and bicycle improvements on East SFDB, including modifications to the SFDB/Larkspur Landing Circle West intersection, relocation of the existing eastbound lane drop (where the road narrows from two lanes to one) to reduce the congestion into the SFDB/Larkspur Landing Circle East intersection) and relocation of a portion of the Class I path. Construction of these improvements is expected to start in the fall of 2017 and be completed by mid-February 2018. The project is located approximately 0.75 mile from the project site.

- Bon Air Bridge Replacement Project: The City of Larkspur proposes to replace the existing, structurally deficient Bon Air Road Bridge between Magnolia Avenue and South Eliseo Drive in Larkspur.[216] The replacement bridge would feature fewer bridge supports, dedicated bike lanes, and protected multi-use paths. Construction of the replacement bridge is anticipated to begin in spring 2018. The project is located less than 0.5 mile from the project site.

- Magnolia Avenue/Madrone Avenue Intersection Improvements[217]: The City of Larkspur proposes to install crosswalk enhancements, including rapid rectangular flashing beacons and other minor intersection modifications. Construction is anticipated in fall 2017. The project is located more than 1.0 mile from the project site.

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214 Metropolitan Transportation Commission, 2017. Metropolitan Transportation Commission website. Available online at: https://mtc.ca.gov/our-work/plans-projects/major-regional-projects/richmond-san-rafael-bridge-access-improvements (last accessed October 6, 2017).

215 City of Larkspur, 2017. City of Larkspur Staff Report, September 20, 2017 City Council Meeting. Available online at: http://cityoflarkspur.org/DocumentCenter/View/7675 (last accessed October 6, 2017).

216 City of Larkspur website: http://www.ci.larkspur.ca.us/660/Bon-Air-Bridge-Replacement. (last accessed on October 6, 2017).

217 City of Larkspur website: http://www.ci.larkspur.ca.us/664/Streets-Projects. (last accessed on October 6, 2017).

- Doherty Drive at Redwood High School Safe Pathways[218]: The City of Larkspur proposes to install improvements to crosswalk, sidewalk, pathway and bike lanes on Doherty Drive in front of Redwood High School. Construction is anticipated in summer 2017. The project is located approximately 0.5 mile from the project site.

- Local Streets Pavement Rehabilitation[219]: Various local streets throughout Larkspur would be repaved with a new surface layer of asphalt. Streets include a section of Madrone Avenue, Frances Avenue, and select streets in the Heather Gardens and Palm Hill neighborhoods. Construction was anticipated in summer 2017.

- Magnolia Avenue ADA Improvements[220]: Accessibility upgrades would be constructed along Magnolia Avenue between Lark Court and Woodland Road. Phase 2 between King and Post Streets would be constructed in 2018/2019. Phases 3 and 4 from Post Street to Woodland Road and from Lark Court to King Street would be constructed in 2019/2020.

- Doherty Drive Rule 20A Undergrounding[221]: Utility poles would be removed and utility lines undergrounded along Doherty Drive between Magnolia Avenue and Ross Lane and between Riviera Circle and Lucky Drive in Larkspur. Construction is anticipated in 2019.

- Corte Alejo Storm Drain Replacement[222]: The City of Larkspur proposes to replace the damaged storm drainage system that runs from Via La Paz to Corte Alejo in Greenbrae. Construction is anticipated in fall 2017.

- Hillview Gardens Storm Drain Reconfiguration[223]: The City of Larkspur proposes to reconfigure the storm drain system in the Hillview Gardens neighborhood and re-route stormflow to a new storm drain pump station on Bon Air Road. Construction is anticipated in 2019/2020.

- Winship Avenue Bridge Replacement Project[224]: The Town of Ross proposes to replace the existing, structurally deficient Winship Avenue Bridge over San Anselmo Creek. Construction is anticipated to begin in 2017.

Long-Term Development. Long-term countywide cumulative development can be estimated based on the 2007 Marin CWP and the 1990 City of Larkspur General Plan. According to the Marin CWP, unincorporated land in the immediate vicinity of the project is designated for single-family residential, multi-family residential, public facility, neighborhood commercial and office commercial. Land in the City of Larkspur is designated for residential, administration and professional offices,

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218 Ibid.
219 Ibid.
220 Ibid.
221 Ibid.
222 City of Larkspur website: http://www.ci.larkspur.ca.us/662/Storm-Drain-Projects. (last accessed on October 6, 2017).
223 Ibid.
224 Town of Corte Madera website: http://www.ci.corte-madera.ca.us/528/Active-Projects (last accessed on October 6, 2017).

commercial, and public facilities. These areas are largely built out so the potential for future development in these areas is limited. The potential development as outlined in the Marin Countywide Plan and the City of Larkspur General Plan was considered in the cumulative analysis in this EIR along with the specific projects identified above.

6.3.2 Cumulative Effects of the Proposed Project

The following analysis examines the cumulative effects of the proposed project. The potential cumulative effects of the proposed project are summarized below for each of the topics that are analyzed in Chapter 4.0 of the EIR.

6.3.2.1 Aesthetics

For aesthetics, the area relevant to cumulative visual impacts is the project viewshed – namely, the area visible from the project site and areas that would have a view to the project site. Potential cumulative visual impacts could occur if other projects in combination with the proposed project cumulatively contribute to the degradation or deterioration of the visual setting, or damage scenic views or vistas.

Implementation of the proposed project, combined with the development of other past, present, and reasonably foreseeable future projects in the area, would not result in a cumulatively considerable impact to aesthetics. As discussed in **Section 4.1, Aesthetics**, the project would not result in any significant and adverse impacts to scenic vistas, scenic resources within a scenic highway, or to the visual character of the site and surroundings. The proposed project would result in the removal of native trees/vegetation, rehabilitation of roadway pavement, reconfiguration of the roadway and intersections, and installation of various roadway infrastructure (e.g., low retaining walls, signals, sidewalks). However, visual changes resulting from the proposed project would be consistent with the existing visual condition, which is a highly developed, urban roadway corridor. Nighttime construction would introduce a new source of nighttime lighting to the project area; however, mitigation measures included in Section 4.1 would ensure that construction lighting is installed to reduce the cumulative impact of light spillage from the proposed project.

Other cumulative projects identified in the area would re-develop properties or construct new facilities on currently vacant land, resulting in similar landscape changes. However, these projects would not substantially change the visual character given the already highly urbanized nature of the project area. These projects may also introduce new sources of light and glare that could affect nighttime views in the project area. Like the proposed project, these projects would be required to prepare lighting plans that ensure exterior lighting would be shielded from adjacent uses.

Therefore, the proposed project's incremental contribution to aesthetic impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

6.3.2.2 Air Quality

The geographic area for air quality impacts encompasses the air basin for some pollutants such as ozone, and is more localized for others, such as carbon monoxide hotspots. According to the BAAQMD, regional air pollution is largely a cumulative impact. No single project is sufficient in size

to independently create regional nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. Therefore, if daily average or annual emissions of construction- or operational-related criteria air pollutants exceed any applicable threshold established by the BAAQMD, the proposed project would result in a cumulatively significant impact. The proposed project would not exceed the daily or annual emission thresholds established by the BAAQMD. Therefore the proposed project would not result in a cumulatively considerable contribution to regional air quality impacts, and the cumulative impact would be less than significant.

6.3.2.3 Biological Resources

The geographic area for cumulative biological resource impacts encompasses the plant communities and habitats in the project vicinity, including Wolfe Grade Creek and its watershed. The project site and surrounding neighborhoods are fully urbanized, retain little natural habitat and exhibit a high level of disturbance.

As described in **Section 4.3, Biological Resources,** Implementation of the proposed project would result in the loss of existing wetlands (roadside ditch), removal of riparian vegetation along Wolfe Grade Creek, and could adversely affect the habitat and populations of special-status animal species, including nesting birds, salmonids, bats, and several reptile and amphibian species. The project could also result in the removal of native and non-native trees along the project corridor. Project impacts to these resources would be reduced to less-than-significant levels with implementation of the mitigation measures in Section 4.3, Biological Resources. These measures fully mitigate for the loss of wetlands and impacts to special-status plant and animal species, and also include measures to control construction-related runoff from entering Wolfe Grade Creek.

Projects identified above are also located in an existing, highly developed, urbanized environment that significantly lowers the potential to contain biologically sensitive resources. These project areas would have the potential to support similar urban adapted special-status species and wetland features (e.g., roadway ditches). Other cumulative projects would be subject to similar CEQA/NEPA review to identify any potential site-specific biological resources and would be required to mitigate potential impacts pursuant to the applicable regulatory framework. Due to the urbanized nature of the area, no cumulative impacts to biological resources are likely to occur from the proposed project or other approved projects that have been identified. For these reasons, the proposed project would not result in a considerable contribution to any cumulative impacts to biological resources.

6.3.2.4 Cultural Resources

The geographic extent for cumulative cultural resource impacts encompasses the project site and adjacent areas that may contain resources relevant to the history and pre-history of California and Marin County. No known historical, archaeological, or paleontological resources were identified on the project site; however, three archaeological cultural resources were identified within 500 feet of the project corridor. In addition, the project corridor –situated north of Corte Madera Creek and marshland – and general vicinity would have attracted Native American populations, which allows for the possibility of the project and other planned developments in the project area to potentially contain unknown archaeological resources.

Construction activities associated with the proposed project could result in significant impacts to archaeological and paleontological resources and human remains. The proposed project's impacts to these resources would be reduced to less-than-significant levels with implementation of the mitigation measures in **Section 4.4, Cultural Resources**. These measures would fully protect identified and previously unidentified archeological resources, paleontological resources and human remains.

Other cumulative projects would be subject to similar CEQA/NEPA review to identify any potential site-specific cultural resources and would be required to mitigate potential impacts pursuant to the goals and policies of the Marin CWP, the City of Larkspur General Plan, and the Town of Ross General Plan, along with applicable State regulations. Implementation of these measures would ensure that cumulative impacts to cultural or paleontological resources from other development projects in the City, region, or State are avoided or mitigated. Therefore, in the unlikely event that any resources are encountered at the project site during construction activities, the proposed project would not result in a considerable contribution to cumulative impacts to cultural or paleontological resources.

6.3.2.5 Geology and Soils

Impacts related to geologic hazards are generally site-specific, rather than cumulative in nature, because each project area has unique geologic considerations that would be subject to uniform site development and construction standards. Therefore, the geographic area for cumulative geologic and soils impacts includes the project site and adjacent sites.

The proposed project is located in an area that is subject to groundshaking, liquefaction, soil erosion, and landslides. The cumulative impacts associated with these geologic phenomena would be confined to the project vicinity and would be reduced to less-than-significant levels with implementation of the mitigation measures recommended in **Section 4.5, Geology and Soils**.

Geologic hazards related to future development are site specific and relate to the type of structures and foundation types proposed, as well as soil composition and slope. Other relevant cumulative projects in the vicinity would be expected to identify and mitigate, to the extent feasible, the respective impacts related to geology, soils, and seismicity, similar to the proposed project. Such mitigation measures would help minimize cumulative impacts generally. Furthermore, implementation of the identified mitigation measures would ensure that the project would not make a cumulatively considerable contribution to any such impacts and the cumulative impact would be less than significant.

6.3.2.6 Global Climate Change

Climate change is a global environmental problem in which: (a) any given development project contributes only a small portion of any net increase in GHGs and (b) global growth is continuing to contribute large amounts of GHGs across the world. The analysis of global climate change impacts and GHG emissions, by its nature, is primarily a cumulative impact analysis. Land use projects may contribute to the phenomenon of global climate change in ways that would be experienced

worldwide, and with some specific effects felt in California. However, no scientific study has established a direct causal link between individual land use project impacts and global warming.

As discussed in **Section 4.7 Global Climate Change**, the project would not interfere with any plan or regulation intended to reduce GHG emissions as the project would not generate new automobile trips. GHG emissions, as a result of project construction activities, would be mitigated to less than significant with implementation of mitigation measures identified in **Section 4.7, Global Climate Change**. Given the project's consistency with the Marin County CAP and the City of Larkspur CAP and the nature of the project (roadway improvements), the proposed project would not result in a cumulatively considerable contribution to greenhouse gas emissions with the implementation of measures that are proposed as part of the project, and required by State or local regulations.

6.3.2.7 Hazards and Hazardous Materials

The geographic context for cumulative hazards and hazardous materials impacts is the project site and adjoining areas that could be affected by releases of hazardous material that could migrate across property lines. Excavation of soils and associated construction activities of the project could result in the release of lead-based paint and residual groundwater contamination from four leaking underground storage tank sites located adjacent to the project site. Given the location of these four known sites, it is reasonably foreseeable that other projects in the immediate vicinity could also encounter residual groundwater contamination. Implementation of mitigation measures identified in **Section 4.8, Hazards and Hazardous Materials**, would reduce impacts related to the potential extraction of residual groundwater contamination. Furthermore, the project would be required to adhere to all applicable laws and regulations and would be subject to similar mitigation measures to ensure impacts are less than significant. Therefore, the project's contribution to any potential cumulative impact would not be considerable.

Since the project site is not located within a wildfire hazard area, no individual-level or cumulative impacts would occur relative to wildfire hazards. Similarly, since the project would not exceed specified building heights, no cumulative impact related to aviation hazards would occur.

6.3.2.8 Hydrology and Water Quality

The geographic area considered for cumulative hydrology and water quality impacts is the Ross Valley Watershed. Stormwater runoff from SFDB either infiltrates into adjacent vegetation and swales or collects in storm drains and culverts that discharge to Corte Madera Creek, which flows into the Central San Francisco Bay. Cumulative impacts for hydrology and water quality could occur through the contamination of water bodies as a function of cumulative discharges and/or the cumulative increased risk of exposing people or structures to a significant loss, injury or death because of flooding.

Stormwater discharges are affected by urban pollutants that contribute to the degradation of the water quality of Corte Madera Creek and the Central San Francisco Bay. Urban pollutants in stormwater include petroleum hydrocarbons, sediments, metals, pesticides, and trash. Past, current and reasonably foreseeable projects in the vicinity of the project site could result in cumulative impacts associated with stormwater discharges, similar to the potential impacts from construction.

In order to adequately address cumulative water quality impacts, stormwater regulations have become progressively more stringent since the passage of the federal Clean Water Act, and current NPDES permits now require new development and redevelopment projects to manage and treat all significant sources of stormwater pollutants and reduce runoff. These NPDES permit requirements apply to the cumulative projects, as well as the project. As such, a reduction in runoff and overall pollutant loads in stormwater in the vicinity of the project site is anticipated over time, thereby reducing cumulative impacts. Although overall water quality in Corte Madera Creek and the Central San Francisco Bay is anticipated to improve over time, these water bodies are currently designated as "impaired" by the State Water Board.

The project would not use, handle, store, or substantially generate any of the compounds or constituents contributing to the impaired status of the above water bodies, with the exception of trash that may be generated during construction activities. The proper storage and disposal of trash during construction of the project as required by the applicable regulations described above would ensure that the project would not have a cumulatively considerable impact on water quality.

Stormwater drainage generated by the project site would not cause an increase in the flow rate or volume of stormwater being discharged to the storm drain system, and therefore the proposed project would not have a cumulatively considerable impact on flooding, erosion, or exceeding storm drainage capacity.

6.3.2.9 Land Use and Planning Policy

The cumulative context for land use and planning includes development anticipated within a ¼-mile radius of the project site. As described above, few of the listed projects are located within ¼-mile of the project site. Development of the proposed project would be consistent with the Marin CWP, the City of Larkspur General Plan, and the overall vision for development in this area of the County. The proposed project entails rehabilitation of an existing roadway; it does not propose any changes to land use, and would not contribute to or cause unplanned growth or result in any considerable contribution to any land use conflicts.

Incompatibility between new development projects and existing sensitive land uses would potentially arise as construction activities associated with the project could create temporary indirect effects, such as noise, vibration, air pollutant emissions, traffic congestion and access disruptions. Mitigation measures have been included to minimize or eliminate construction-related effects (See **Section 2.0, Executive Summary** for a comprehensive list of project mitigations). It is expected that any new projects proposed in the project vicinity would be required to comply with adopted land use plans and zoning requirements and would be required to incorporate mitigation measures to avoid or lessen any anticipated construction and operational effects. As the project is rehabilitating an existing roadway with enhanced pedestrian/bicycle facilities, the project would not result in any changes to existing or long-term land use patterns. Consequently, the proposed project and related developments are not expected to result in substantial unplanned changes to the long-term patterns of land use, and thus, would have no cumulative impact related to land use and planning.

6.3.2.10 Noise

The study area for cumulative noise impacts consists of the area surrounding the project site that experience noise resulting from project-related operations or project related construction, as noise levels decline rapidly with distance.

A significant cumulative impact would occur if implementation of the proposed project would result in any permanent increase of 5 dBA or more in ambient noise levels at the existing sensitive receptors in the project vicinity that are currently exposed to noise levels above the County's normally acceptable threshold for that type of land use. As discussed in **Section 4.11, Noise**, the proposed project would not result in increased traffic volumes and therefore would not generate a substantial long-term noise level increase.

Construction of the proposed project would result in short-term noise impacts to adjacent residential uses; however, construction noise would be short term and Mitigation Measure NOI-1 would reduce the construction noise impacts to the extent feasible. The project's construction activities would not be considered a cumulatively considerable contribution to the total noise environment in the project vicinity and this impact would be less than significant. Therefore, the proposed project's contribution to cumulative noise impacts is not significant or considerable.

6.3.2.11 Public Services and Recreation

The geographic area for cumulative public services impacts includes any development within the service area of each public service provider. As described in **Section 4.12, Public Services and Recreation,** fire protection and emergency medical services for the project site would be provided by the Larkspur Fire Department and the Ross Fire Department. The project site is also located within the Kentfield Fire Protection District. The project site is served by the Town of Ross Police Department, Marin County Sheriff's Department, and the Central Marin Police Authority (CMPA). In addition, the College of Marin, located along the project alignment has a police force. Three school districts provide public education services in the project area: 1) Ross School District; 2) Kentfield School District; and 3) Tamalpais School District.

No increased demand for the physical expansion of these services would occur as a result of the project as it is rehabilitating an existing road and replacing existing water pipelines and not introducing a new residential population that would require these public services. As described in **Section 4.12, Public Services and Recreation,** temporary lane closures and traffic rerouting during construction could incrementally increase fire and police response times. Implementation of mitigation measures identified in Section 4.12, Public Services and Recreation, and Section 4.13, Traffic and Circulation, would reduce potential construction impacts to less than significant.

Cumulative projects in Marin County could increase demand for police and fire services. This increased demand could compromise the emergency response times of the police and fire departments. The Marin CWP and City of Larkspur General Plan require public services and utilities to be maintained at adequate service ratios and service levels through compliance with applicable General Plan policies and applicable State and local regulations, and fair-share contributions by new developments. Other cumulative projects would also be required to allow emergency responders to

maintain adequate emergency response times, as required by the Marin CWP and City of Larkspur General Plan. Therefore, adherence to these policies and regulations would ensure that the project and other cumulative development projects would not result in significant impacts to public services and utilities. As a result, the project would not result in a considerable contribution to cumulative impacts to public services or utilities.

6.3.2.12 Transportation and Circulation

The study area for cumulative transportation and circulation impacts includes the intersections and roadways identified and studied in the traffic impact analysis (see **Section 4.13, Traffic and Circulation**), including SFDB, Elm Avenue, College Avenue, Laurel Grove Avenue, Wolf Grade, Bon Air Road, El Portal Drive, La Cuesta Drive, and Eliseo Drive.

As described in Section 4.13, Traffic and Circulation, the cumulative plus project traffic volumes were analyzed with existing intersection geometrics and proposed intersection geometrics to identify future travel times and intersection delay. Rehabilitation of the roadway would improve vehicle travel through the project corridor while also enhancing bicycle and pedestrian circulation through improved facilities. Other foreseeable projects in the project area could generate increased vehicle traffic along the arterials in the project area, contributing to cumulative traffic impacts. However, because the proposed project would improve traffic conditions in the project area, the proposed project would not contribute to cumulative traffic impacts.

Construction activities associated with the proposed project could result in traffic delays, safety concerns, and pavement damage created by construction traffic. The majority of the projects identified above would be completed prior to the start of construction for the proposed project (e.g. prior to 2019). The Larkspur Rose Garden Community Facilities project, the Drake's Cove Project, the Magnolia Avenue ADA Improvements Project (Phases 3 and 4), and the Doherty Drive Rule 20A Undergrounding Project could potentially have construction periods occurring simultaneously with the project, compounding construction-related traffic delays and/or congestion. However, construction-related traffic impacts would be localized to the project area and would be reduced to less-than-significant levels with implementation of Mitigation Measure TR-1. Therefore, the proposed project's incremental contribution to transportation and circulation impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

6.3.2.13 Utilities and Service Systems

The cumulative impact area for utility and service systems includes the project area and the service areas of the local utility providers for wastewater, solid waste and stormwater drainage facilities. Implementation of the proposed project would not require the extension of water supply or wastewater conveyance infrastructure into the project site nor would it increase demand for water, wastewater treatment, or solid waste disposal. Although on-site infrastructure improvements could be required to provide a range of utilities to cumulative projects in Marin County, associated impacts would generally be site-specific. Therefore, the proposed project's incremental contribution to public services and utilities impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

6.4 EFFECTS FOUND NOT TO BE SIGNIFICANT

CEQA requires a brief discussion of the potential effects of a project that have been determined not to be significant and, therefore, not required to be evaluated in detail. This section provides summary discussions of such topics where the project would have no effect.

6.4.1.1 Agricultural and Forest Resources

The project site is mapped as "Urban and Built-Up Land" by the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP)[225] (California Department of Conservation, Division of Land Resource Protection 2011). Urban and Built-Up Land is occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. Common examples include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment and water control structures.

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. The project site is not zoned for agricultural use and is not under a Williamson Act contract.

No Farmland is mapped on or near the project site and no portion of the project site is zoned for agricultural use or under Williamson Act contract. The proposed project would be constructed within public right-of-way that is not currently in agricultural use. Therefore, the proposed project would not affect agricultural resources, operations or contracts.

The project site is not currently used for timberland production, nor is it zoned for forest land or timberland. No forest lands or timberland are located on the project site. Therefore, the proposed project would not conflict with existing zoning for, or cause rezoning of, forest land or timberland nor would the proposed project would not result in the loss of any forest land or convert forestland to non-forest use.

6.4.1.2 Population, Employment and Housing

The proposed project does not include the construction of new homes, and therefore would not directly affect population growth. The proposed project would replace/upgrade existing facilities (e.g., roadway surface, pipelines) and construct new facilities (e.g., sidewalk, signals) within the existing roadway right-of-way. As described in Section 6.1, proposed improvements would not accommodate additional traffic or extend or expand infrastructure or services to existing undeveloped areas in the vicinity of the roadway, and, therefore, the project is not expected to indirectly induce substantial population growth. Construction has been planned to avoid any displacement of people or housing. The project would not be expected to have any effect on population or housing.

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[225] California Department of Conservation, Division of Land Resources Protection, 2011. Farmland Mapping and Monitoring Program, *Marin County Important Farmland 2010 Map.* May. Available online at: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2010/mar10.pdf (Accessed 28 August 2013).

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7.2 REFERENCES

Association of Bay Area Governments (ABAG), 2013. Earthquake Shaking Scenario, Entire San Andreas Fault: Magnitude 7.9 event. Accessed 06/19/17 at: http://gis.abag.ca.gov/website/Hazards/?hlyr=northSanAndreas

ABAG, 2001. Liquefaction Hazard Map. Accessed 10/5/09 at: quake.abag.ca.gov.

American Ornithological Society,n.d. The Birds of North and Middle America Checklist. Available online at: http://checklist.aou.org/

Baker, R. J., et al. 2003. *Revised checklist of North American mammals north of Mexico, 2003*.

Baldwin, B.G., et al., eds. 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. University of California Press, Berkeley.

Bay Area Air Quality Management District (BAAQMD), 2017. *CEQA Air Quality Guidelines*. May.

BAAQMD, 2013. *Toxic Air Contaminant Control Program Annual Report 2013 Volume 1.* May. http://www.baaqmd.gov/research-and-data/air-toxics/annual-report

BAAQMD, n.d. *Climate, Physiography, and Air Pollution Potential – Bay Area and Its Subregions (Referenced by County)*.

BAAQMD, Bay Area Attainment Status, 2015.

BAAQMD, 1982. *Rules and Regulations, Regulation 7: Odorous Substances.* March.

BAAQMD, 2015. *Source Inventory of Bay Area Greenhouse Gas Emissions.* January.

Bieling, David G., 2000. *Archaeological Investigations at CA-MRN-255/H, Larkspur, Marin County, California*. San Francisco: Holman & Associates.

Borrero, Jose, et al., 2006. *Numerical Modeling of Tsunami Effects at Marine Oil Terminals in San Francisco Bay*. Report for the Marine Facilities Division of the Californian State Lands Commission. June 8.

California Air Resources Board (CARB), 2011. *Fact Sheets*. Website: www.arb.ca.gov/html/brochure/pm10.htm October.

CARB, 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. October. https://www.arb.ca.gov/diesel/factsheets/rrpfactsheet.pdf

CARB, 2016. https://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

CARB, 2013. Update of Mineral Land Classification: Aggregate Materials in the North San Francisco Bay Production Region, Sonoma, Marin, and Southwestern Solano Counties, California, California Geological Survey.

CARB, 2017. *Greenhouse Gas Inventory Data for 2000–2015*. Website: www.arb.ca.gov/cc/inventory/data/data.htm (accessed July 19, 2017).

CARB, 2013. *Greenhouse Gas Inventory: 2020 Emissions Forecast.* Website: https://www.arb.ca.gov/cc/inventory/data/bau.htm. (accessed July 19, 2017).

California Climate Change Center, 2006. *Our Changing Climate. Assessing the Risks to California.* July.

California Department of Conservation (CDC), 1987. Mineral Land Classification Special Report 146, Map Plate 2.14, Livermore Quadrangle.

CDC, Division of Land Resources Protection, 2011. Farmland Mapping and Monitoring Program, *Marin County Important Farmland 2010 Map.* May. Available online at: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2010/mar10.pdf (Accessed 28 August 2013).

California Department of Fish and Wildlife (CDFW). 2003. *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database*. Wildlife and Habitat Data Analysis Branch, Vegetation Classification and Mapping Program, California Department of Fish and Game, Sacramento.

CDFW. 2017. California Natural Diversity Database (commercial version), Biogeographic Data Branch. April 1, 2017.

California Department of Forestry and Fire Protection (CAL Fire), 2008. *Marin County Very High Fire Hazard Severity Zones in Local Responsibility Area*. October.

California Department of Transportation (Caltrans), 2012. *Guidance for SSP 14-11.07 – Remove Yellow Traffic Stripe and Pavement Marking with Hazardous Waste Residue*. December 14.

California Emergency Management Agency, 2009. *Tsunami Inundation Map for Emergency Planning, San Rafael Quadrangle, San Quentin Quadrangle*. July 1.

California Environmental Protection Agency, Air Resources Board, 2014. *California Greenhouse Gas Emission Inventory: 2000-2012.* March.

California Health and Safety Code Section 25501.

California Native Plant Society. 2017. Inventory of rare and endangered plants in California (online edition, v7-09a). Website: www.cnps.org/inventory (accessed June 6, 2017).

California, State of, Governor's Office of Planning and Research. 2016. *California Environmental Quality Act Statutes and Guidelines.*

California, State of, 2008. California Energy Commission's Public Interest Energy Research Program. *The Future is Now: An Update on Climate Change Science, Impacts, and Response Options for California*. September.

California, State of, 2006. Department of Water Resources. *Progress on Incorporating Climate Change into Management of California's Water Resources*. July.

CalRecycle, 2010. Solid Waste Facility Permit 21-AA-0005, dated May 17, 2010. Available online at: http://www.calrecycle.ca.gov/SWFacilities/Directory/21-AA-0005/Document (Accessed August 29, 2017).

Central Marin Police Authority. 2017. About CMPA. Available online at: http://www.centralmarinpolice.org/129/About-CMPA (last accessed June 8, 2017).

Central Marin Police Authority. 2017. Police Staffing Levels. Available online at: http://www.centralmarinpolice.org/130/Police-Staffing-Levels (accessed June 8, 2017).

Central Marin Sanitation District. 2017. About Us. Available online at: https://www.cmsa.us/aboutus/ (last accessed July 7, 2017).

Corte Madera, Town of. Town of Corte Madera Active Projects website. Available online at: http://www.ci.corte-madera.ca.us/528/Active-Projects (last accessed on October 6, 2017).

Crother, B.I., editor. 2012. *Scientific and standard English names of amphibians and reptiles of North America north of Mexico*. Society for the Study of Amphibians and Reptiles (SSAR) Herpetological Circular 39.

Department of Resources Recycling and Recovery. 2017. Approval of Preliminary Closure and Postclosure Maintenance Plans for the Redwood Landfill, Facility No. 21-AA-0001. 15 June.

Department of Toxic Substances Control, 2017. *Envirostor*. https://www.envirostor.dtsc.ca.gov/public/. Accessed: June 6, 2017.

Desgrandchamp, Cindy, and David Chavez, 1984. *Archaeological Resources Evaluation for the Central Marin Sanitation Wastewater Transportation Facilities Improvement Project—Phase II, Marin County, California.* David Chavez, Consulting Archaeologist, Mill Valley, California.

Elefteriadou, L., M. Jain, and K. Heaslip. 2008. *Impact of Lane Closures on Roadway Capacity, Part B: Arterial Work Zone Capacity.* University of Florida, Gainesville, Florida. January.

Federal Aviation Administration, 2017. *Airport Contacts Information – County of Marin*. Last updated: May 25. http://www.faa.gov/airports/airport_safety/airportdata_5010/. Accessed: June 15.

Federal Emergency Management Agency (FEMA), 2016. *Flood Insurance Rate Map, Marin County*. Maps 06041C0458F and 06041C0459F. March 16.

Federal Highway Administration, 2006. FHWA Highway Construction Noise Handbook, Table 9.1

Fredrickson, David A., 1974. Cultural Diversity in Early Central California: A View from the North Coast Ranges, *Journal of California Anthropology* 1:41-54.

Harris, Cyril M., 1998. *Handbook of Acoustical Measurements and Noise Control.*

Hilty, J. A., W. J. Lidicker, Jr., and A. M. Merenlender. 2006. Corridor ecology: The science and practice of linking landscapes for biodiversity conservation. Island Press, Washington, D.C.

Intergovernmental Panel on Climate Change, 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC.*

Kaijankoski, Philip, and Jack Meyer, 2011. *Extended Phase I Subsurface Geoarchaeological Investigation Report for the Central Marin Ferry Connection Project, Larkspur, Marin County, California*. Davis, CA: Far Western Anthropological Research Group, Inc.

Kentfield/Greenbrae Community Planning Group and Marin County Planning Department. 1987. *Kentfield/Greenbrae Community Plan.* May. http://www.marincounty.org/depts/cd/divisions/planning/plans-policies-and-regulations/community-and-area-plans

Kentfield Fire Protection District. 2017. Kentfield Fire Protection District. Available online at: http://www.kentfieldfire.org/administration/about (last accessed June 7, 2017).

Kentfield School District. 2017. District Overview. Available online at: http://www.kentfieldschools.org/pages/Kentfield_School_District/About_Us/Overview (last accessed June 8, 2017).

Lamphier – Gregory, 2009. *San Rafael Airport Recreational Facility, Draft Environmental Report*. SCH No. 2006012125. March.

Larkspur, City of. City of Larkspur Storm Drain Projects website. Available online at: http://www.ci.larkspur.ca.us/662/Storm-Drain-Projects. (last accessed on October 6, 2017).

Larkspur, City of. City of Larkspur Bon Air Bridge Replacement website. Available online at: http://www.ci.larkspur.ca.us/660/Bon-Air-Bridge-Replacement. (last accessed on October 6, 2017).

Larkspur, City of. City of Larkspur Street Projects website. Available online at: http://www.ci.larkspur.ca.us/664/Streets-Projects. (last accessed on October 6, 2017).

Larkspur, City of. 2017. City of Larkspur Staff Report, September 20, 2017 City Council Meeting. Available online at: http://cityoflarkspur.org/DocumentCenter/View/7675 (last accessed October 6, 2017).

Larkspur, City of. Larkspur Zoning Districts. Available online at: http://www.ci.larkspur.ca.us/DocumentCenter/Home/View/471, (accessed 6 June 2017).

Larkspur, City of, 2010. Larkspur Municipal Code, Title 18 Zoning. Current through March 2017. Available online at: http://www.codepublishing.com/CA/Larkspur/?Larkspur18/Larkspur1816.html. (accessed on June 7, 2017).

Larkspur, City of. 1990. *Larkspur 1990 General Plan*. http://www.ci.larkspur.ca.us/152/General-Plan. (accessed on June 16, 2017).

Larkspur, City of, 2004. *City of Larkspur Bicycle and Pedestrian Master Plan.* August. http://www.ci.larkspur.ca.us/557/Bicycle-Pedestrian-Safety

Larkspur, City of. 2010. *City of Larkspur Climate Action Plan*. June.

Larkspur, City of, 2014. All-Hazard Mitigation Plan, Version 2.0. http://hazardmitigation.calema.ca.gov/docs/lhmp/Larkspur_City_ofl.pdf. (accessed on June 16, 2017.

Larkspur, City of, 2017. City of Larkspur Municipal Code, Section 12.16, Trees, Including Heritage Trees. Available online at: http://www.codepublishing.com/CA/Larkspur/?Larkspur18/Larkspur1816.html. (accessed on July 16, 2017).

Larkspur, City of. 2017. Fire Stations & Apparatus. Available online at: http://www.ci.larkspur.ca.us/240/Fire-Stations-Apparatus (last accessed June 7, 2017).

Leidy, R.A. 2007. Ecology, Assemblage Structure, Distribution, and Status of Fishes in Streams Tributary to the San Francisco Estuary, California. San Francisco Estuary Institute Contribution No. 530. San Francisco Estuary Institute, Oakland, California.

Leidy, R.A., G.S. Becker, and B.N. Harvey, 2005. Historical distribution and current status of steelhead/rainbow trout (Oncorhynchus mykiss) in streams of the San Francisco Estuary, California. Center for Ecosystem and Restoration, Oakland, California.

Mahoney, Daniel, Acting Fire Chief, Ross Valley Fire Department. Written correspondence June 27, 2017.

Marin, County of, MarinMap, https://www.marinmap.org/Html5Viewer/Index.html?viewer=smmdataviewer

Marin, County of, 2008. *Marin County Unincorporated Area Bicycle and Pedestrian Master Plan*. March.

Marin, County of. 2007. *Marin Countywide Plan*. November 6.

Marin, County of, 2008. Marin County Development Code.

Marin, County of, 2009. Public Works: Uniform Construction Standards, All cities and County of Marin. Accessed at: www.co.marin.ca.us/depts/pw/main/pdfs/uniform_standards/UCS-compiled.pdf

Marin, County of, 2012. *Local Hazard Mitigation Plan*. October 16.

Marin, County of. 2015. *Marin County Climate Action Plan 2015 Update.* July.

Marin, County of, 2017. Marin County Code Chapter 22.27, Native Tree Protection and Preservation. Available online at: https://library.municode.com/ca/marin_county/codes/code_of_ordinances?nodeId=MARIN_CO_CALIFORNIAMUCO (Accessed on July 16 ,2017)

Marin County Airport Land Use Commission, 1991. *Airport Land Use Plan; Marin County Airport Gnoss Field*. June 10.

Marin County Community Development Agency. 2004. Stream Geographical Information Systems Layer.

Marin County Community Development Agency, 2005. *Flooding Technical Background Report*. November.

Marin County Community Development Agency, 2016. PROPDEV51 Annual Proposed Development Survey. Available online at: https://www.marincounty.org/~/media/files/departments/cd/planning/currentplanning/publications/landuseplan/propdev/pd51_report.pdf . October.

Marin County Sheriff's Office. 2017. Patrol Division. Available online at: http://www.marinsheriff.org/about-us/field-service-bureau/patrol-division (last accessed June 8, 2017).

Marin County Watershed Program, 2017. Ross Valley Watershed. http://www.marinwatersheds.org/ross_valley.html. Accessed on June 22.

Marin Municipal Water District. n.d. Water. Website: https://www.marinwater.org/31/Water (Accessed June 14, 2017).

Marin Municipal Water District. 2017. Water. Available online at: https://www.marinwater.org/31/Water (last accessed June 13, 2017).

Marin Sanitary Service. 2017. Marin Resource Recovery Center. Available online at: http://marinsanitaryservice.com/marin-resource-recovery-center-mrrc/ (last accessed July 6, 2017).

Marin Sanitary Service. 2017. Marin Recycling Center (MRC). Available online at: http://marinsanitaryservice.com/marin-recycling-center-mrc/ (last accessed July 6, 2017).

Marin Sanitary Service. 2017. MSS Spring Update. April. Available online at: http://marinsanitaryservice.com/mobius/msswp-content/uploads/2014/06/2017-Spring-Newsletter-Final-web-op.pdf (last accessed July 6, 2017).

Metropolitan Transportation Commission, 2017. Metropolitan Transportation Commission Pavement Management Certification webpage: http://mtc.ca.gov/our-work/invest-protect/investment-strategies-commitments/fix-it-first/local-streets-and-roads-2 (last accessed October 5, 2017).

Metropolitan Transportation Commission, 2017. Metropolitan Transportation Commission Plans and Projects webpage: https://mtc.ca.gov/our-work/plans-projects/major-regional-projects/richmond-san-rafael-bridge-access-improvements (last accessed October 6, 2017).

Miller Engineering Group, 2017. *Geotechnical Investigation Report, Sir Francis Drake Boulevard MMWD Pipeline Replacement Project, Larkspur and Kentfield, California.*16 June.

Milliken, Randall et al., 2007. Punctuated Culture Change in the San Francisco Bay Area, in *California Prehistory: Colonization, Culture, and Complexity*, edited by T.L. Jones and K.A. Klar, pp. 99-123, Lanham, MD: Alta Mira Press.

National Center for Education Statistics, 2017. *School Search Tool for Public and Private Schools*. http://nces.ed.gov/ccd/schoolsearch/. Accessed: June 15.

National Oceanic & Atmospheric Administration (NOAA), 2017. *Mean Sea Level Trend (station) 9414290 San Francisco, California.* https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=9414290 (accessed July 19, 2017).

National Oceanic and Atmospheric Administration, 2017. *Sea Level Rise Viewer*. Available: https://coast.noaa.gov/digitalcoast/tools/slr. Accessed on June 22.

National Resource Conservation Service, 2016. Web Soil Survey, https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed 6/19/17.

Nelson, J.S., et al., eds. 2004. *A list of common and scientific names of fishes from the United States, Canada, and Mexico*. Sixth edition. American Fisheries Society Special Publication 20.

Nilsen, T. H., Wright, R. H., et al., 1979. Relative Slope Stability and Land-use Planning in the San Francisco Bay Region, California. USGS Professional Paper 944.

Pacific Institute. 2012. *The Impacts of Sea Level Rise on the San Francisco Bay*. California Energy Commission. Publication number: CEC-500-2012-014.

Pastron, Alan, 2008. *Limited Cultural Resources Evaluation for the Ross Valley Sanitation District Kentfield Forcemain Rehabilitation Project, Located in the City of Kentfield, Marin County, California.* Archeo-Tec, Oakland.

Perkins, Jeanne B. 2001. The Real Dirt on Liquefaction, A Guide to the Liquefaction Hazard in Future Earthquakes Affecting the San Francisco Bay Area, ABAG Publication Number: P01001EQK, February.

PG&E. 2017. *Exploring Clean Energy Solutions.* Website: http://www.pge.com/en/about/environment/pge/cleanenergy/index.page (accessed June 13, 2017).

Pomi, Mark, Fire Chief, Kentfield Fire Protection District. Written correspondence July 11, 2017.

Rauch, Alan F., 1997, EPOLLS: An Empirical Method for Predicting Surface Displacements due to Liquefaction-Induced Lateral Spreading in Earthquakes, Ph. D. Dissertation, Virginia Tech, Blacksburg, VA.

Roop, William, 1991. *A Cultural Resources Evaluation of a Proposed Reclaimed Water Pipeline in the San Quentin Point, Corte Madera, Larkspur, Kentfield, and San Rafael Areas.* Archaeological Resource Service, Petaluma.

Roop, William, 1993. *A Cultural Resources Evaluation of the Sir Francis Drake Boulevard Repaving and Drainage Improvement Project, Marin County, California*. Archaeological Resource Service, Petaluma.

Ross School District. 2017. District Profile. Available online at: https://www.rossbears.org/site/default.aspx?PageID=1106 (last accessed June 8, 2017).

Ross Valley Fire Department. 2017. Fire Station 18- Ross. Available online at: http://www.rossvalleyfire.org/about/fire-stations (last accessed June 8, 2017).

Ross Valley Sanitary District. 2017. About Us. Available online at: http://rvsd.org/about-us (last accessed June 13, 2017).

San Francisco Bay Regional Water Quality Control Board (Regional Water Board), 2017. San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan). May 4.

Schneider, Tsim Duncan, 2010. *Placing Refuge: Shell Mounds and the Archaeology of Colonial Encounters in the San Francisco Bay Area, California.* PhD dissertation, Department of Anthropology, University of California, Berkeley.

Schwitalla, Al W. and Christopher Powell, 2014. *Archaeological Data Recovery at CA-MRN-67, Larkspur, Marin County, California*. San Francisco: Holman & Associates Archaeological Consultants.

Shurtz, Scott, Fire Chief Larkspur Fire Department. Written correspondence June 30, 2017.

State Water Resources Control Board, 2017. *GeoTracker*. https://geotracker.waterboards.ca.gov/. Accessed: June 6, 2017.

State Water Resources Control Board, 2012. Final 2012 California Integrated Report (Clean Water Act Section 303(d) list/305(b) Report). 2012 California 303(d) List of Water Quality Limited Segments

Stewart, Suzanne B., 1999. *Archaeological Test Excavations at CA-MRN-644/H, San Rafael, Marin County, California*. Rohnert Park, CA: Anthropological Studies Center.

Tamalpais Union High School District. 2017. About Our District. Available online at: http://www.tamdistrict.org/domain/3 (last accessed June 8, 2017).

Town of Ross, 2012. Local Hazard Mitigation Plan. January 12.

Town of Ross. 2017. Police. Available online at: http://www.townofross.org/police (last accessed June 8, 2017).

Welsh, H. 1994. Bioregions: An Ecological and Evolutionary Perspective and a Proposal for California. California Fish and Game (80) 3:97-124.

WRA Environmental Consultants, 2014. Upper Road Land Division Draft Subsequent Environmental Impact Report. April. Available online at: http://www.townofross.org/documentsandforms?field_microsite_tid=21 (Accessed July 16, 2017)

United States Department of Agriculture Soil Conservation Service, 1985. Soil Survey of Marin County California. Available online at: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/california/marinCA1985/marinCA1985.pdf. Accessed 6/19/17.

United States Environmental Protection Agency (U.S. EPA), 2017. Ambient Air Quality at the San Rafael Monitoring Station

U.S. EPA, 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. March.

U.S. EPA, 2011. Website: www.epa.gov/air/criteria.html (Accessed March 18, 2015). October.

U.S. EPA. 2015. *Black Carbon*. September. http://www3.epa.gov/blackcarbon/basic.html (accessed on February 17, 2016).

U.S. EPA, 2014. Climate Change Indicators in the United States: Global Greenhouse Gas Emissions. Website: https://www.epa.gov/climate-indicators/climate-change-indicators-global-greenhouse-gas-emissions (accessed July 19, 2017).

U.S. EPA, 2016. Climate Change Indicators: U.S. Greenhouse Gas Emissions. Website: https://www.epa.gov/climate-indicators/climate-change-indicators-us-greenhouse-gas-emissions (accessed July 19, 2017).

Van Gosen, B.S., and J.P. Clinkenbeard, 2011. *Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California.* U.S. Geological Survey Open-File Report 2011-1188.

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8.0 ACRONYMS AND GLOSSARY OF TERMS

8.1 ACRONYMS

A-PEFZA	Alquist-Priolo Earthquake Fault Zoning Act
AASHTO	American Association of State Highway Officials
ABAG	Association of Bay Area Governments
ADT	Average Daily Traffic
ARB	California Air Resources Board
BAAQMD	Bay Area Air Quality Management District
Basin Plan	Water Quality Control Plan for the San Francisco Bay Basin
BMP	Best Management Practice
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
CalIPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CDFG	California Department of Fish & Game
CEC	California Energy Commission
CESA	California Endangered Species Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	Methane
CHRIS	California Historical Resources Information System
CIWMB	California Integrated Waste Management Board
CMA	Congestion Management Agency
CMP	2007 Marin Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	Carbon Monoxide
County	Marin County
CSE	Countywide Siting Element
CTPB	Cement Treated Permeable Base
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CWP	Marin Countywide Plan
dB	decibel
dBA	A-weighted sound level
DBH	Diameter Breast Height (approximately 4.5 feet above ground)

DOSH	California Division of Occupational Safety and Health
DOT	United States Department of Transportation
DPW	Department of Public Works
DSD	Division of Safety of Dams
DTSC	Department of Toxic Substances Control
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EOP	Operational Area Emergency Operations Plan
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FAR	Floor Area Ratio
FEMA	Federal Emergency Management Agency
FIGR	Federated Indian Graton Rancheria
FIRM	Flood Insurance Rate Map
FMC	Fishery Management Councils
FHWA	Federal Highways Administration
GGNRA	Golden Gate National Recreation Area
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Global Positioning System
GWP	Global Warming Potential
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCP/NCCP	Habitat Conservation Plan/Natural Community Conservation Plan
HFCs	Hydrofluorocarbons
HSPRMP	Health and Safety Plan and a Risk Management Plan
ISA	International Society of Arboriculture
JPA	Joint Powers Authority
LBP	Lead Based Paint
L_{dn}	Day-night average sound level
L_{eq}	Equivalent continuous sound level
LOS	Level of Service
LSA	LSA Associates, Inc.
LSD	Lagunitas School District
LTS	Less than Significant
MBTA	Migratory Bird Treaty Acts
MCFD	Marin County Fire Department
MCOE	Marin County Office of Education
MCSO	Marin County Sheriff's Office
MCSTPPP	Marin County Stormwater Pollution Prevention Program
MCTD	Marin County Transit District
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MLD	Most Likely Descendant
MMI	Modified Mercalli Intensity Scale
MMWD	Marin Municipal Water District

MPH	Miles Per Hour
MRCD	Marin Resource Conservation District
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NALs	Numeric Action Levels
NELs	Numeric Effluent Limitations
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NMWD	North Marin Water District
NHPA	National Historic Preservation Act
N_2O	Nitrous Oxide
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Association Fisheries
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRCS	United States Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
NWP	Northwestern Pacific
O_3	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OHP	Office of Historic Preservation
OHWM	Ordinary High Water Mark
OSHA	Occupational Health and Safety Administration
PCBs	polychlorinated biphenyls
PFC	Permeable Friction Course
PFCs	Perfluorocarbons
$PM_{2.5}$	Fine Particulate Matter
PM_{10}	Coarse Particulate Matter
ppm	parts per million
PRBO	Point Reyes Bird Observatory
PRC	Public Resource Code
RAC	Rubberized Asphalt Concrete
RCRA	Resource Conservation and Recovery Act
RMP	Risk Management Plan
ROG	Reactive Organic Gases
RWQCB	Regional Water Quality Control Board
S	Significant
SAFZ	San Andreas Fault Zone
SARA	Superfund Amendments and Reauthorization Act
SCA	Stream Conservation Area
SF_6	Sulfur Hexafluoride

SFDB	Sir Francis Drake Boulevard
SFHA	Special Flood Hazard Area
SGVSEP	San Geronimo Valley Salmon Enhancement Plan
SHMA	Seismic Hazards Mapping Act
SMARA	Surface Mining and Reclamation Act
SO_2	Sulfur Dioxide
SR	State Route
SU	Significant and Unavoidable
SUSD	Shoreline Unified School District
SWAMP	State Board Surface Water Ambient Monitoring Program
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAM	Transportation Authority of Marin
TIA	Total Impervious Area
TCP	Traffic Control Plan
TMDL	Total Maximum Daily Load
TSCA	Toxic Substances Control Act
TUHSD	Tamalpais Union High School District
UCMP	University of California Museum of Paleontology
UCS	Uniform Construction Standards
UNFCCC	United Nations Framework Convention on Climate Change
USACE	United States Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
VMT	Vehicle Miles Traveled
VOCs	Volatile Organic Compounds
vph	vehicles per hour
WCA	Wetland Conservation Area

8.2 GLOSSARY

303(d) List: List of impaired water bodies published by each state and approved by the EPA pursuant to the Clean Water Act.

Alquist-Priolo Fault Zone: State-identified areas of potentially active and recently active faults.

Alquist-Priolo Earthquake Fault Zone Act: Places specific responsibilities on local governments for identification and evaluation of seismic and geologic hazards, and formulation of programs and regulations to reduce risk in identified locations.

Americans with Disabilities Act: The Americans with Disabilities Act of 1990 (ADA) is a federal law that prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation. In 2013, the Departments of Justice and Transportation issued directive that

requires agencies to provide curb ramps when streets, roads, and highways are altered through resurfacing.

Anadromous: Fish that migrate up rivers from the sea to breed and spawn in fresh water.

Artifact Scatter: This type of site contains a variety of artifacts such as cores, bifaces, ground stone, pottery, and debitage. Artifact scatters may represent short-term use areas or special purpose sites. Ecofacts, such as bone, shell, charcoal, and fire-affected rock (FAR) are not present; with their addition, the site becomes a habitation site.

California Environmental Quality Act (CEQA): California law requiring the disclosure of environmental effects of proposed projects before discretionary approval can be issued.

Channel: The bed of a stream or waterway.

Cumulative impact: Two or more environmental effects that, when considered together, are considerable or that compound or increase other environmental impacts.

Dripline: The area located directly under the outer circumference of the tree branches.

Environmental Impact Report (EIR): A detailed CEQA document that is prepared when a proposal or alternatives have the potential for significant impact on the environment.

Evolutionarily Significant Unit (ESU): A population or group of populations that is substantially reproductively isolated from other populations of the same species and that represents an important component of the evolutionary legacy of the species. An ESU for Pacific salmon species is considered to be a distinct population segment (DPS), which may be listed under the ESA if believed to be in danger or extinction.

Historic Site: Sites that are not prehistoric or protohistoric, but are the remains of human activities more than 45 years old. An historic archaeological site is an historical site with a buried component such as a trash deposit, foundation or footing, or some other buried site component.

Invasive Exotic Species: Species that reproduce aggressively, that are non-native (i.e., do not naturally occur) in an ecosystem under consideration, and that cause or are likely to cause economic or environmental harm or harm to human health.

Lead agency: The agency either preparing or taking primary responsibility for preparing the CEQA document.

Lithic Scatter: A lithic or flake scatter contains a scatter of only flaked stone tools such as cores, lithic debitage, or bifaces that may have been created from one or more distinct lithic reduction episodes. If no subsurface distribution is evident, and the density of items is less than three flaked stone items per square meter, a lithic scatter can be referred to as a “sparse lithic scatter” (Jackson et al. 1988).

Mitigation: A modification of the proposal or alternative that lessens the intensity of its impact on a particular resource.

National Geodetic Vertical Datum (NGVD): A fixed surface reference established by the U.S. Coast and Geodetic Survey to which relief features and elevation data are referenced.

National Pollutant Discharge Elimination System (NPDES): A federal requirement under the Clean Water Act (CWA) that any discharge of a non-point source of pollution into waters of the United States be in conformance with any established water quality management plan developed under the Clean Water Act.

Notice of Preparation: Notice to regulatory agencies and the public of intent to prepare an environmental impact report.

Ordinary High Water Mark: that line along the stream bank established by the fluctuations of stream flow and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, erosion, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other indicators. The ordinary high water line denotes the limits of waters of the U.S. under Section 404 of the Clean Water Act except where jurisdictional wetlands extend beyond the line. It also denotes the limits of the stream bed.

Pedestrian Hybrid Beacon: A Pedestrian Hybrid Beacon or High-Intensity Activated Crosswalk (HAWK)- type beacon is a traffic control device used to stop road traffic and allow pedestrians to cross safely. The purpose of the pedestrian hybrid beacon is to allow protected pedestrian crossings, stopping road traffic only as needed.

Project Site: The area that will be physically disturbed or has the potential to be physically disturbed by the proposed project which includes the SFDB paved roadbed and an approximate 20-foot wide zone from the edge of pavement.

Project Study Area: The project site and a zone of approximately 200 feet on either side of the project site within which habitat types were mapped and the potential for indirect biological impacts from the project were assessed.

Project Vicinity: The project site and surrounding region within approximately one mile of the project site, containing occurrences of special-status biota or suitable habitats for such species.

Right-of-Way: The right to pass over property owned by another. The strip of land over which facilities such as roadways, railroads, or power lines are built.

Riparian: Relating to, or living or located on the banks of a river or stream.

Salmonid: Fish species belonging to, or characteristic of the family *Salmonidae*, which includes the salmon, trout, and whitefish.

Scoping: The early involvement of the interested and affected public.

Special-Status Species: For purposes of this EIR, any species listed or proposed for listing under the State or federal Endangered Species Acts, or recognized as locally rare by recognized authorities.

Stormwater Management Plan: A project-specific plan to manage stormwater runoff, require for certain activities under the National Pollutant Discharge Elimination System.

Stormwater Pollution Prevention Plan: A project-specific plan to reduce water pollution from stormwater required for certain activities under the National Pollutant Discharge Elimination System.

Top of Bank: The upper limits of the stream channel zone that encompasses the lateral margins of the stream; the top of bank corresponds with the general limits of high stream flows that form the general morphological characteristics of the stream.

Tributary: A smaller river or stream that flows into a larger river or stream.

Watershed: The area from which water drains to a single point or body of water; also called drainage basin.

Wetland*:* An area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include, but are not limited to, swamps, marshes, bogs, and similar areas (as defined by the U.S. Army Corps of Engineers and the U.S. EPA).

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