State Route 37 Corridor
Planning and Environmental Linkages Study

December 2022

CALTRANS Equity Statement

The California Department of Transportation (Caltrans) acknowledges that communities of color and underserved communities experienced fewer benefits and a greater share of negative impacts associated with our state's transportation system. Some of these disparities reflect a history of transportation decision-making, policy, processes, planning, design, and construction that "quite literally put up barriers, divided communities, and amplified racial inequities, particularly in our Black and Brown neighborhoods."[1]

Caltrans recognizes our leadership role and unique responsibility in State government to eliminate barriers to provide more equitable transportation for all Californians. This understanding is the foundation for intentional decision-making that recognizes past, stops current, and prevents future harms from our actions.

To create a brighter future for all Californians, Caltrans will implement concrete actions as outlined in our Race & Equity Action Plan, regularly update our Action Plan, and establish clear metrics for accountability in order to achieve the following commitments:

1. **People** - We will create a workforce at all levels that is representative of the communities we serve by improving our recruitment, hiring, contracting, and leadership development policies and practices.
2. **Programs & Projects** - We will meaningfully engage communities most impacted by structural racism in the creation and implementation of the programs and projects that impact their daily lives by creating more transparent, inclusive, and ongoing consultation and collaboration processes. We will achieve our equity commitments through an engagement process where everyone is treated with dignity and justice. We will reform our programs, policies, and procedures based on this engagement to avoid harm to frontline and vulnerable communities. We will prioritize projects that improve access for and provide meaningful benefits to underserved communities.
3. **Partnerships** - By leveraging our transportation investments, we also commit to increasing pathways to opportunity for minority-owned and disadvantaged business enterprises, and for individuals who face systemic barriers to employment.
4. **Planet** - We commit to combating the climate crisis and its disproportionate impact on frontline and vulnerable communities — such as Black and Indigenous peoples, communities of color, the people experiencing homelessness, people with disabilities, and youth. We will change how we plan, design, build, and maintain our transportation investments to create a more resilient system that more equitably distributes the benefits and burdens to the current and future generations of Californians.

[1] https://calsta.ca.gov/press-releases/2020-06-12-statement-on-racial-equity

State Route 37
Planning and Environmental Linkages Study

California Department of Transportation, District 4

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Prepared by

ICF, San Francisco and Sacramento, California

Jacobs, Oakland, California

December 2022

Caltrans District 4 acknowledges the valuable assistance in conducting the State Route 37 Planning and Environmental Linkages Study and report provided by the following:

- Caltrans – Division of Environmental Analysis
- Caltrans – Division of Transportation Planning
- Consultant Team
  - ICF
    - Jacobs
    - Fehr & Peers
    - Zephyr Collaboration

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LIST OF ACRONYMS AND ABBREVIATIONS

Bay Area	North San Francisco Bay Area
BCDC	Bay Conservation and Development Commission
CAAQS	California ambient air quality standards
Caltrans	California Department of Transportation
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CARI	California Aquatic Resource Inventory
CEQA	California Environmental Quality Act
CGS	California Geological Survey
CH_4	methane
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CO_2	carbon dioxide
COVID-19	coronavirus disease
CWA	Clean Water Act
DAA	*Design Alternative Assessment*
DLR	detection level for the purpose of reporting
DOC	Department of Conservation
EPC	Equity Priority Communities
ESC	Executive Steering Committee
FHWA	Federal Highway Administration
GARVEE	Grant Anticipation Revenue Vehicles
GIS	geographic information system
HOV	high-occupancy vehicles
HRAs	High Resource Areas
HSIP	Highway Safety Improvement Program
I-	Interstate
LCTOP	Low Carbon Transit Operations Program
MCL	maximum contaminant level
MOU	memorandum of understanding
MPDG	Multimodal Project Discretionary Grant Opportunity
MRZs	Mineral resource zones
MTC	Metropolitan Transportation Commission
NAAQS	national ambient air quality standards
NCST	National Center for Sustainable Transportation
NEPA	National Environmental Policy Act
NHFP	National Highway Freight Program
NHPP	National Highway Performance Program

NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NRCS	Natural Resources Conservation Service
NSFLTP	Nationally Significant Federal Lands and Tribal Projects
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
OPC	Ocean Protection Council
PDAs	Priority Development Areas
PLT	Project Leadership Team
PPAs	Priority Production Areas
PPP	Public-Private Partnerships
PROTECT	Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation
RAISE	Rebuilding American Infrastructure with Sustainability and Equity
RAP	Resource Agency Partners Group
ROW	right-of-way
SHA	State Highway Account
SMART	Sonoma-Marin Area Rail Transit
SMCL	secondary maximum contaminant level
SR 116	Lakeville Highway
STBGP	Surface Transportation Block Grant Program
STIP	State Transportation Improvement Program
SWRCB	State Water Resources Control Board
TFB	Transportation Finance Bank
TIRCP	Transit and Intercity Rail Capital Program
TRAs	Transit-Rich Areas
TWG	technical working groups
US	U.S. Highway
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMT	vehicle miles traveled

CHAPTER 1

Introduction

The California Department of Transportation (Caltrans) District 4 undertook this State Route (SR) 37 Planning and Environmental Linkages (PEL) Study (SR 37 PEL Study) to identify a transportation vision, identify needs, and consider alternatives to address the present and future threats to this critical corridor. It is the first PEL study led by Caltrans and performed on a state highway in California.

California SR 37 lies along the northern edge of San Pablo Bay, running from U.S. Highway (US) 101 in Novato to Interstate (I-) 80 in Vallejo. The 21-mile corridor is a heavily used regional connection serving Marin, Sonoma, Napa, and Solano Counties and linking the east and west portions of the North San Francisco Bay Area (Bay Area). SR 37 is divided into western, middle, and eastern portions. The western portion is a 7.2-mile, four-lane expressway-type facility that starts at US 101 and conforms to the SR 121 junction at Sears Point. The middle portion is a 9.5-mile, two-lane conventional highway from Sears Point to the Walnut Avenue interchange just west of the Napa River Bridge. The eastern portion, a 2.1-mile, four-lane freeway, continues from the Napa River Bridge to SR 29.

With much of the corridor at a low bayside elevation, SR 37 is extremely vulnerable to flood-related closures. Such events are expected to be exacerbated by oncoming sea level rise and climate change. According to projections from the San Francisco Bay Conservation and Development Commission (BCDC) and Ocean Protection Council (OPC), by 2100, nearly the entire length of the corridor between the cities of Novato and Vallejo is predicted to become permanently submerged as sea levels rise (Figure 1-1) (County and Transportation Authority of Marin 2020: 48).

By 2100, nearly the entire length of the corridor between the cities of Novato and Vallejo is predicted to become permanently submerged as sea levels rise.

The loss of SR 37 to sea level rise would have profound consequences for the communities in the region, the economy, and the environment. As a key corridor providing access for Solano County, the result would be additional traffic on distant roadways that are not equipped to handle it and economic loss and reduced opportunity for disadvantaged community residents of Solano County who commute to Marin and Sonoma Counties (Caltrans 2021a) (Chapter 4, *Existing Conditions*). A long-term solution that addresses sea level rise, minimizes adverse environmental impacts, and preserves connectivity through this corridor over the long term (Chapter 3, *Vision, Purpose, and Need*) requires coordinating with numerous jurisdictions, agencies, and interest groups with a stake in the corridor (Chapter 2, *Agency, Stakeholder, and Public Engagement*). Solutions will also have to comply with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), both regulations that require agencies to consider and disclose the effects of their actions on the quality of the natural environment (Chapter 8, *Implementation Plan*).

PARTNER AGENCIES

California Department of Transportation

Metropolitan Transportation Commission

Transportation Authority of Marin

Sonoma County Transportation Authority

Napa Valley Transportation Authority

Solano Transportation Authority

This SR 37 PEL Study evaluated corridor-wide solutions that address the diverse environmental and social needs of the SR 37 corridor. Its collaborative and integrated approach to transportation decision-making will inform project development for both the near-term improvements currently being planned or designed and the final corridor plan to implement the preferred alternative, ensuring such related work does not preclude the

WHAT IS A PEL?

The Planning and Environmental Linkages (PEL) process was developed by the Federal Highway Administration to encourage an early and integrated approach to transportation planning and environmental review (23 Code of Federal Regulations [CFR] Part 450, Appendix A: *Linking the Transportation Planning and NEPA Processes*, and 23 United States Code 168: *Integration of Planning and Environmental Review*). A PEL study gathers preliminary data and considers the conceptual level of design, traffic analyses, and evaluation of environmental impacts while engaging regulatory and transportation agencies, stakeholders, and the public in the process. The outcome of a PEL study may include recommendations for solving the problems of a transportation facility or corridor.

The collaborative approach of a PEL study can yield better transportation projects that more effectively serve the community's transportation needs. By resolving differences on key issues early in planning, a PEL study improves project delivery timeframes. This can reduce long-term project costs, time, and risk to the public while promoting environmental stewardship and equity.

long-term solution (Chapter 7, *Alternatives Screening and Identification of the Preferred Alternative*). The information developed during the SR 37 PEL Study, including critical input from stakeholders, the public, and regulatory agencies, will inform the subsequent project phasing and environmental reviews, minimize duplication of effort during environmental analysis, and streamline environmental approvals and permitting (Chapter 8).

1.1 LEAD AGENCIES AND PARTNERS

Caltrans District 4 is the lead agency for the SR 37 PEL Study. Caltrans District 4 partnered in this effort with Caltrans Headquarters, the Metropolitan Transportation Commission (MTC), Transportation Authority of Marin, Sonoma County Transportation Authority, Napa Valley Transportation Authority, and Solano Transportation Authority. Together, these agencies have collaborated on a "One Corridor, One Team, Many Solutions" approach to the Resilient SR 37 program, with multiple studies and outreach to address the SR 37 corridor's critical flooding, sea level rise, congestion, ecosystem connectivity, and multimodal issues and ongoing efforts to address them (Chapter 2). Remaining chapters of this report detail their collaborative efforts and the outcomes.

1.2 ORGANIZATION OF THIS REPORT

This report documents the SR 37 corridor's challenges and the process and outcomes of the SR 37 PEL Study. It is a high-level summary of processes and findings that are documented in greater detail in Appendices A through N. These appendices comprise the collected technical memoranda, presentations, and other materials prepared for this PEL study and are broadly grouped according to topic. Appendices I through N consist of information related to the preferred alternative and other required documents. Information provided in the appendices is incorporated by reference in this report.

Chapter 1, *Introduction*, presents the historic context of the issues and studies for the SR 37 corridor. It identifies the lead agencies and partners for the SR 37 PEL Study and describes the SR 37 PEL Study Area (Study Area) and surrounding land uses.

Chapter 2, *Agency, Stakeholder, and Public Engagement*, describes Caltrans' outreach to and coordination with resource and regulatory agencies, Native American Tribes, key stakeholder groups, and the public at large during the SR 37 PEL Study. This chapter also introduces the technical and stakeholder working groups that collaborated on development of purpose and need, alternatives, and evaluation criteria for alternatives selection.

Chapter 3, *Vision, Purpose, and Need*, describes the process through which the corridor vision and SR 37 PEL Study needs and purpose statement were collaboratively developed.

Chapter 4, *Existing Conditions*, summarizes the current status of the individual natural, cultural, and human resources of the Study Area. More detail is available in Appendix C, *State Route 37*

Planning and Environmental Linkages Study Existing Conditions Reports. This chapter also explains which resources were not evaluated and why.

Chapter 5, *Alternatives Identification*, presents the methods employed for identification of alignments and alternatives, including consultations with stakeholders. It then describes the initial set of proposed alternatives from a variety of sources and the additional alternatives developed during the course of the SR 37 PEL Study.

Chapter 6, *Alternatives Evaluation Criteria*, describes the process of developing three levels of screening criteria in collaboration with stakeholders and the outcomes of each stage of screening.

Chapter 7, *Alternatives Screening and Identification of the Preferred Alternative*, identifies the preferred alternative, the reasons it was selected, and why others were eliminated or not carried forward for further analysis in the SR 37 PEL Study.

Chapter 8, *Implementation Plan*, outlines next steps for completing project design, identifying and securing funding, and environmental documentation strategies.

In this study, "San Pablo Baylands" and "baylands" are collective terms that refer to the islands, marshes, wetlands, and other sensitive areas that are generally found along the northern edge of San Pablo Bay between Novato and Vallejo. These include areas around Novato Creek, the Petaluma River, Tolay Creek, Sonoma Creek, and the Napa River, and are managed under a mix of public and private ownership. This study uses the terms interchangeably.

1.2.1 Appendices

A. State Route 37 Corridor Planning and Environmental Linkages Study Vision, Goals, and Purpose and Need Memorandum

B. State Route 37 Corridor Planning and Environmental Linkages Study Agency, Stakeholder, and Public Outreach and Participation
   - B1: Outreach and Presentation Materials
   - B2: Summary of Stakeholder Survey and Interview Responses

C. State Route 37 Corridor Planning and Environmental Linkages Study Existing Conditions Reports

D. State Route 37 Corridor Planning and Environmental Linkages Study Alternatives Identification Memorandum

E. State Route 37 Corridor Planning and Environmental Linkages Study Alternatives Evaluation Criteria Memorandum

F. State Route 37 Corridor Planning and Environmental Linkages Study Level 1 Evaluation Criteria Screening Memorandum

G. State Route 37 Corridor Planning and Environmental Linkages Study Level 2 Evaluation Criteria Screening Memorandum

H. State Route 37 Corridor Planning and Environmental Linkages Study Level 3 Evaluation Criteria Screening Memorandum

I. Preferred Alternative Constraints and Opportunities Mapbook

J. Preliminary Conceptual Design and Plans for the Preferred Alternative

K. Caltrans SR 37 PEL Questionnaire

L. Letters Received from Participating Agencies and Organizations

M. Preferred Alternative—Cost Estimation Background

N. Risk Register

1.2.2 The PEL Questionnaire

Appendix K, the PEL Questionnaire, is a summary document required by the Federal Highway Administration (FHWA) as part of all PEL studies. Because Caltrans has assumed FHWA's authority for approval of most environmental documents under the NEPA Assignment program, including PEL studies, Caltrans will use the PEL Questionnaire in its report approval procedures.

1.3 SR 37 PEL STUDY BACKGROUND

The search for satisfactory solutions to the problems facing SR 37 and its surrounding habitat began long before Caltrans initiated the PEL process in 2020. In the last two decades, five different but interrelated strands of concerns about the long-term viability of SR 37 have come to the forefront.

- **Traffic Congestion.** Currently, westbound SR 37 traffic typically experiences congestion approaching the lane drop west of the Mare Island interchange for several hours during the weekday AM peak period and throughout much of the day on weekends. Eastbound SR 37 congestion occurs approaching the lane drop east of the SR 121 intersection for several hours during the weekday PM peak period as well as much of the day on weekends. The forecasted conditions indicate that the traffic congestion would increase to a level that is expected to escalate user delay costs, degrade air quality, and and has the potential to increase the collision rate within the corridor.
- **Inadequate Multimodal Accommodation.** There are no designated bicycle or pedestrian facilities in the western and middle portion except for small sections of the San Francisco Bay Trail that roughly parallel parts of the corridor. Except for the Novato Creek Bridge

and Petaluma River Bridge in the western portion, which have less than two-foot shoulder widths, there is sufficient shoulder (greater than four feet) for cycling or walking along the highway. However, high vehicle speeds in excess of 60 miles per hour (mph) make riding and walking very stressful. The eastern portion is a freeway; bicycle and pedestrian access is mostly prohibited. Bicyclists and pedestrians may use the separated path on the eastbound side of the Napa River Bridge and then must exit the elevated structure at Wilson Street. There is a Class 1 bikeway at ground level which parallels the freeway as far as SR 29. Turning south on Wilson Street instead, there are Class 1 and 2 bikeways for about 2/3 of a mile to the Vallejo Transit Center. The path then proceeds all the way to the Carquinez Bridge. The Napa River Bridge crossing and the path leading south across the Carquinez Bridge are all part of the San Francisco Bay Trail.

- **Climate Change.** The potential for climate change—and sea level rise in particular—will worsen flooding on the existing SR 37 corridor in the short term and will fully inundate major portions of the roadway in the long term.
- **Ecological restoration and conservation.** There is an increased awareness, interest, and actions among numerous stakeholders throughout the region towards restoring and enhancing marshland areas in the northern San Pablo Bay area, not only as a means to improve habitat and ecosystem conditions, but also to mitigate the dangers of rising sea levels. Coalitions of federal and state agencies, along with nonprofit organizations and major landowners, have undertaken many restoration efforts and recognized that the current configuration of SR 37 on a long embankment is an impediment to further restoration work.
- **Equity.** The SR 37 corridor is a commuter route for residents of underserved communities in Solano County who must travel to jobs in Marin and Sonoma Counties. Congestion and lack of transit options disproportionately affect disadvantaged communities.

A stream of reports by federal, state, and local agencies and environmental and community stakeholders confronting these concerns became resources for the SR 37 PEL Study as it started to take shape. In 2012 Caltrans contracted with the University of California, Davis to prepare a series of research papers that included the *Highway 37 Stewardship Study* and the *Route 37 Integrated Traffic Infrastructure, and Sea Level Rise Analysis*, among others. In 2015, Caltrans issued the *SR 37 Transportation Concept Report*, further refining understanding on a range of issues. Other previous studies and reports covered the entire SR 37 corridor from US 101 to I-80 in Vallejo, while some focused on either smaller portions of the corridor or considered other modal choices. Resources consulted for this SR 37 PEL Study are identified in Chapter 9, *References Cited*. Chapter 4 summarizes the current state of resources along the corridor.

1.3.1 Climate Change Won't Wait

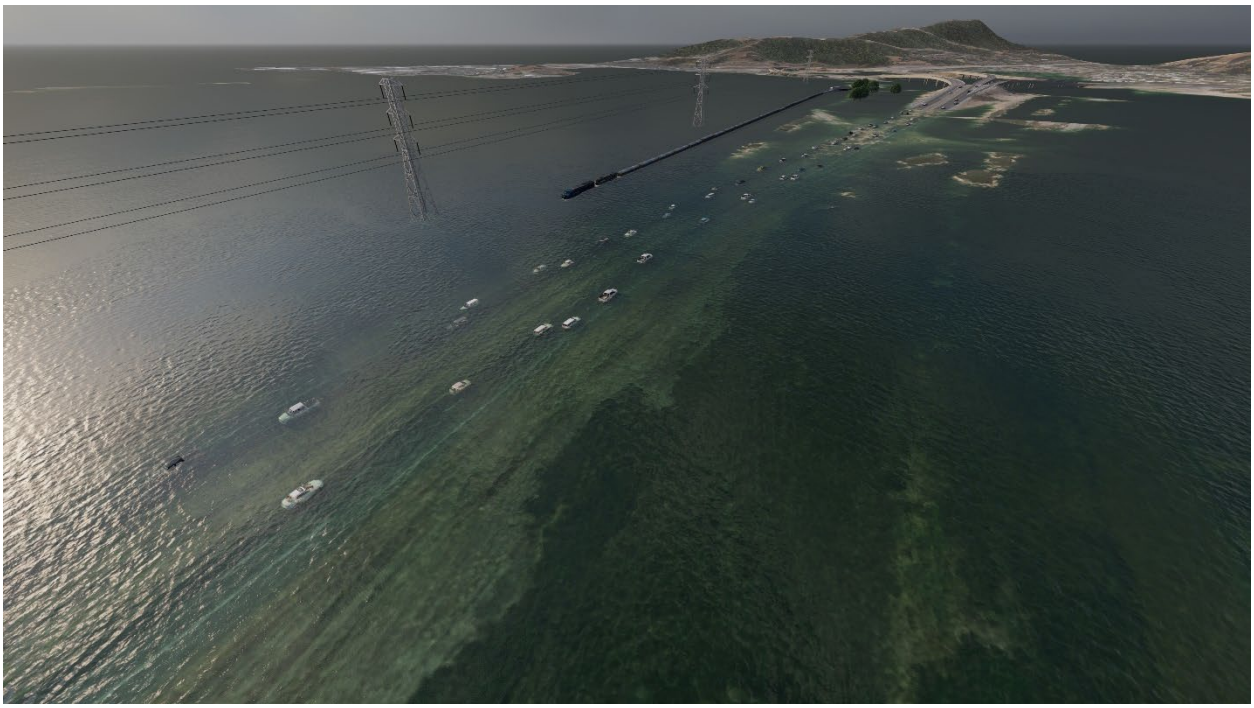
Climate change, primarily sea level rise, is already affecting the Study Area's rivers, wetlands, tidal and tidal transition zone habitats, agricultural and recreational resources, and human activities as well as its transportation infrastructure. Projected future sea level rise and more-intense precipitation events will exacerbate flooding that already occurs during storms and high

tides. Wildfire already has taken a toll on the region, and the risk will only increase with heat and drought coupled with future growth. Appendix C describes the current state of the corridor's natural resources and built environment that will be affected by climate change.

At the same time, a transportation agency's priority is to maintain its infrastructure and optimize traffic operations for safe, efficient travel by the public. The threat of sea level rise coupled with the growing congestion on SR 37 makes it a priority corridor for all four North Bay counties. Recognizing the need for action, the four county transportation authorities signed a memorandum of understanding (MOU) in 2015 "…to develop an expedited funding, financing and project implementation strategy for the reconstruction of SR 37 to withstand rising seas and storm surges while improving mobility and safety along the route." Caltrans and MTC joined in a subsequent MOU in 2019. The SR 37 PEL Study is in part a result of the increased cooperation fostered by this MOU.

A transportation agency's priority is to maintain its infrastructure and optimize traffic operations for safe, efficient travel by the public. The threat of sea level rise coupled with the growing congestion on SR 37 makes it a priority corridor for all four North Bay counties.

Figure 1-1. Visualization of Seven Feet of Sea Level Rise in 2100 at SR 37 Near Novato, Looking West



Originally built in the 1920s, SR 37 itself has affected the habitat through which it passes, disrupting natural processes such as marsh migration that would today allow the local environment to adapt to sea level rise. A transportation facility design adapted to both future climate and traffic conditions presents the opportunity to optimize the infrastructure for habitat resilience as well. Federal and state agencies and nonprofit environmental organizations have invested in ecosystem planning, wetland acquisition, and habitat restoration for over three decades, guided since 1999 by the comprehensive science based *Baylands Ecosystem Habitat Goals* report (Goals Project 1999), updated in 2015 as *The Baylands and Climate Change: What We Can Do* (Goals Project 2015). The award-winning *Grand Bayway Design Roadmap* (Resilient Bay 2022) proposed a scenic elevated causeway to resolve the route's transportation problems and restore tidal flows and marsh migration to natural conditions. These publications and many more formal and informal proposals from competing entities had not gelled into a coherent actionable plan. Meanwhile, Caltrans and regional transportation agencies planned projects that addressed near-term issues to keep the SR 37 corridor safe for travelers and in a state of good repair.

The SR 37 PEL Study was a vehicle to bring together existing research and environmental, regulatory, transportation, and community interests in a public forum to create a holistic picture of the SR 37 corridor and identify solutions. The overarching goal of the SR 37 PEL Study became to assess the ability of a range of alternatives to meet the goals they articulated for the corridor and region. Feedback received from stakeholders and the public was integral to developing purpose and need; identifying and evaluating solutions to the major concerns of traffic congestion, sea level rise, ecological restoration and conservation, public access, multimodal facilities, and equity; and selecting a preferred alternative for implementation (Chapter 2, Chapter 5, and Chapter 7).

1.4 STUDY AREA

The Study Area falls within the North Bay subregion of the nine-county Bay Area and extends well beyond the immediate SR 37 corridor. The Study Area has been informed by two key factors:

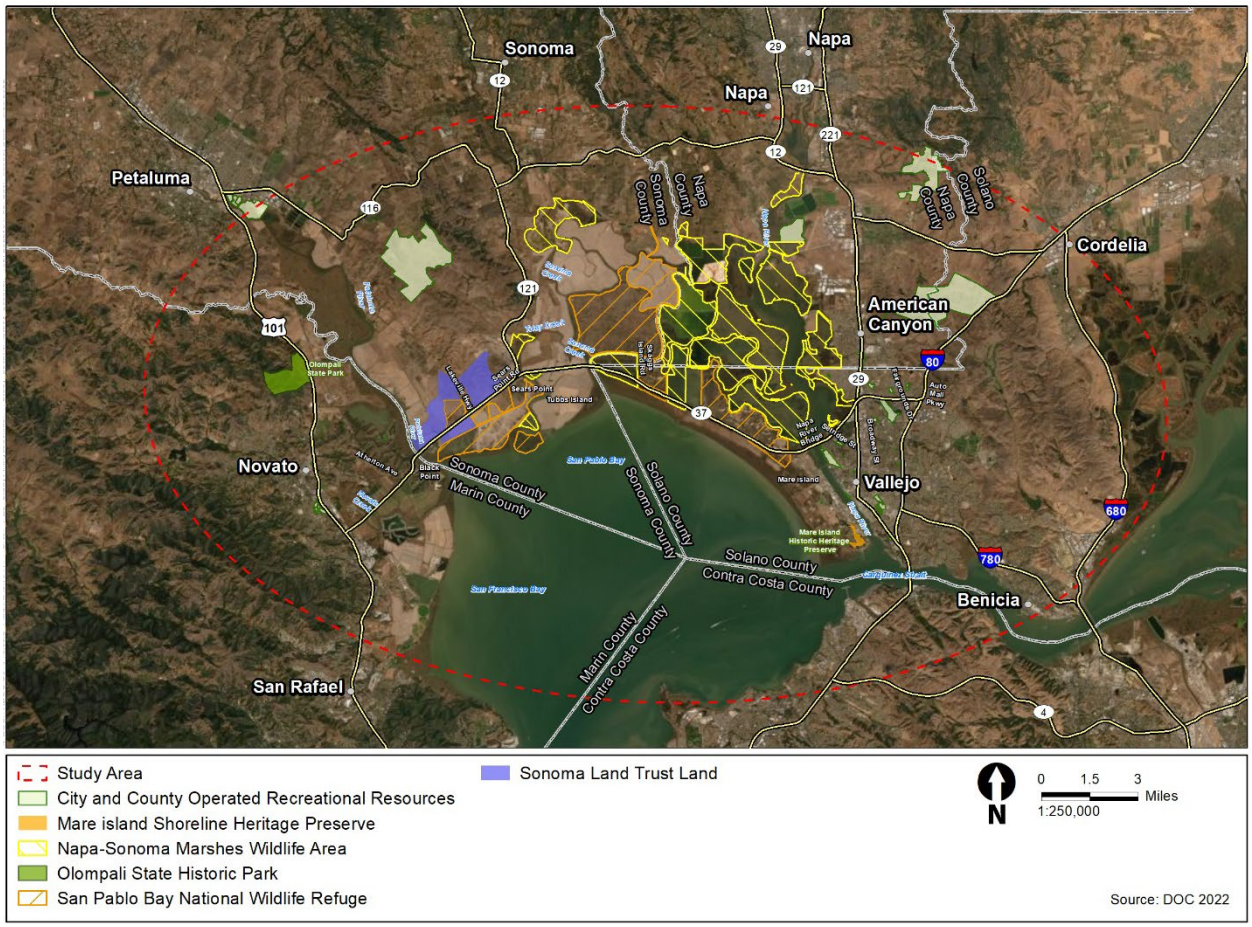
- The location of potential alternative alignments.
- The general physical extent potentially affected by one or more of the potential alternative alignments.

As further discussed in Chapter 5, the PEL Study Team drew upon its own work and the work of many other agencies and organizations to identify a suitable range of alignment alternatives to the existing SR 37 corridor as locations for a relocated roadway. Seven potential alignments (including the existing SR 37 alignment) were initially proposed; an eighth located well outside the area of inundation was added in response to technical working group feedback, and all eight were evaluated for their ability to meet the corridor's purpose and need (Level 1 evaluation criteria). Alignments that met purpose and need were further refined into alternatives to be evaluated along additional criteria. At that stage, and in response to working group

feedback, two additional alternatives that were variations on the overwater alignment in the original eight screened alignments were added and evaluated along a more refined set of criteria during Level 2 and Level 3 evaluations (Chapter 5).

Based on the initial proposed alignments, the Study Area extends roughly from Petaluma in the northwest, to Novato and San Rafael in the southwest, to Vallejo in the southeast and the SR 12/I-80/I-680 interchange in the northeast. The Study Area encompasses these communities as well as Black Point, portions of American Canyon, and other unincorporated portions of all four North Bay counties (Figure 1-2).

Figure 1-2. Planning and Environmental Linkages Study Area



The Study Area includes the entire SR 37 corridor, nearby sections of US 101 and I-80, plus significant portions of other regionally important roadways, including SR 116/Lakeville Highway, SR 121, SR 12, SR 29, Atherton Avenue, and local roads. It includes significant natural and environmental resources including those under the management of the San Pablo Bay National Wildlife Refuge (NWR) and the Sonoma Land Trust. Waterways and wetlands in the Study Area include San Pablo Bay itself; the Petaluma and Napa Rivers; Novato, Tolay, and Sonoma Creeks; and the expansive Napa-Sonoma Marshes Wildlife Area.

Studies of individual resources, as summarized in Chapter 4, may define different Study Areas, in accordance with standard practices and professional judgement for each resource. For example, cultural resources study focuses on resources adjacent to each alignment, while the Study Area for equity and community compatibility extends beyond the limits of the overall Study Area because of how people use the transportation system, and air quality covers the entire air basin.

1.4.1 Regional Character

SR 37 is an east-west corridor that runs about 21 miles along the northern shore of San Pablo Bay. The route reaches from US 101 in Novato in Marin County, through the southern tip of Sonoma County, to I-80 in Vallejo in Solano County. Although SR 37 does not run through Napa County, it is a crucial connection between the four North Bay counties—Marin, Sonoma, Napa, and Solano—linking job markets and housing. The route also provides access to popular destinations such as the Golden Gate National Recreation Area in Marin County, Sonoma Sears-Point Raceway, Six Flags Discovery Kingdom Amusement Park, Sonoma and Napa wine regions, and the North Coast.

Each county in the Study Area has its own defining characteristics and concerns related to the SR 37 corridor. Factors such as land use designations can pose constraints on potential transportation solutions. Marin County has the smallest area of the Study Area's four counties. Most of its land area is protected in open space, tidelands, parks, and agriculture. San Francisco and San Pablo Bays form its eastern border, which includes the San Francisco Bay National Estuarine Research Reserve. Its relatively low population is mostly strung along US 101, roughly parallel to and inland from the shoreline, but its job centers attract commuters from the Solano County's more densely populated urban areas.

REGIONAL SPOTLIGHT: BAYLANDS

The "baylands" are the islands, marshes, wetlands, and other sensitive areas that are generally found along the northern edge of San Pablo Bay.

Sonoma County is the most populated and largest county by acreage in the North Bay Area, with most of those acres undeveloped or zoned for agriculture. The county is one of the state's largest producers of wine grapes. The San Pablo Bay NWR forms its southeastern border. Most of the county's population, however, lives farther inland along the US 101 corridor in the cities of Petaluma, Cotati, Rohnert Park, Santa Rosa, and Windsor. Sonoma County also receives commuters from its neighboring, more urban locales.

Napa County is the least urbanized and least populated of the Study Area counties. About 95% of county land is unincorporated, and half of that is designated rural. The five incorporated areas in the county are the cities of American Canyon, Calistoga, Napa, and St. Helena; and

the town of Yountville. The County prioritizes preservation of agricultural land. A small proportion of agricultural land is given to crops, orchards, and grazing, but vineyards of wine grapes dominate, making Napa County another prime wine country destination. The Napa River winds through extensive marshes north of SR 37 and across the county's southern boundary into Solano County, eventually discharging into the Carquinez Strait, immediately east of San Pablo Bay.

Solano County is also largely agricultural but has the second largest population of the four North Bay counties and the most low-income residents. Solano County is 94% unincorporated, with the majority of land in agricultural use. More than half of the Bay Area's wetlands are in Solano County, including marsh and watershed lands in the southern and western portions of the county that includes the eastern portion of the SR 37 corridor. Whatever land is not farmed, preserved, or undeveloped, holds the county's seven cities—Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo—where most of the population is concentrated. Solano County is also host to the Mare Island Naval Shipyard in Vallejo.

SR 37 is a vital connection, serving job markets and housing between the four counties of the North Bay Area and providing access to popular recreation destinations such as the Golden Gate National Recreation Area in Marin County, Sonoma Sears-Point Raceway, Six Flags Discovery Kingdom Amusement Park, Napa and Sonoma wine regions, and the North Coast.

1.5 USES OF THIS PEL STUDY

This SR 37 PEL Study was initiated after years of controversy, study, and project planning by disparate agencies. Caltrans and its partner agencies recognize that projects both completed and currently planned are only near-term solutions as sea level rises and threatens the corridor while population grows and increases travel demand. Recognizing the complexities involved, staff of U.S. Environmental Protection Agency Region 9 in 2020 recommended that Caltrans conduct a PEL study, noting that the holistic approach of a PEL process is ideally suited to facilitate the coordinated problem-solving the SR 37 corridor demands. Although so much work on the corridor had been done, and was underway prior to Caltrans' decision to conduct a PEL process, by bringing together regulators, stakeholders, and the public (Chapter 2), Caltrans has facilitated development of a clear vision and path forward for improving both transportation facility and natural resources of the SR 37 corridor (Chapter 3).

It is hoped that project implementation can move forward with less controversy now because both regulators and communities were active participants in the study. With a common vision and understanding of purpose and need, informed in part by a survey of existing information augmented with study of current conditions, the PEL Study Team developed a menu of potential solutions and criteria for refining those ideas into a set of alternatives from which to select the most viable. The process resulted in a preferred alternative that fulfills the vision for the corridor

and allows for coordinating improvements and mitigation with other projects within or adjacent to the corridor. The actual building of the preferred alternative will be a long-term proposition that poses design, funding, and logistical challenges for Caltrans and its partners. Many decisions remain to be made; future analysis is needed on:

- Precise alignment placement relative to existing road.
- Location and design of interchanges.
- Access points.
- Bicycle/pedestrian lanes: on structure and/or cantilevered.
- Tolling and future funding.
- Eventual disposition and decommissioning of existing alignment.

This SR 37 PEL Study, however, will accelerate decision-making by becoming the foundation for the next steps of project development, design, and environmental analysis (Chapter 8).

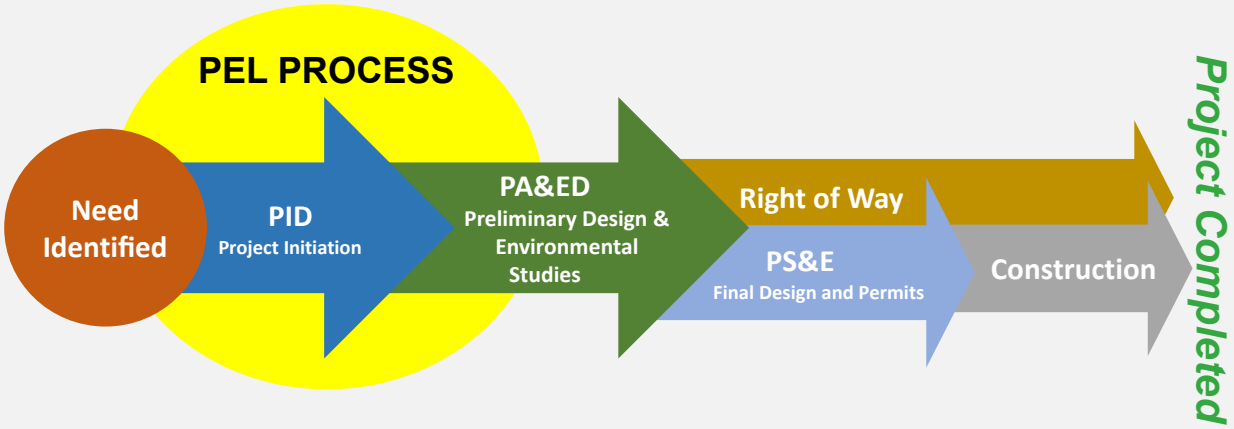
1.6 PEL STUDY ASSUMPTIONS, LIMITATIONS, AND RISKS

The SR 37 PEL Study is built on a wide range of best-available information as of summer 2022 (refer to Chapter 9). As part of this SR 37 PEL Study, the PEL Study Team prepared an extensive existing conditions analysis (refer to Chapter 4) and shared this analysis with the technical working groups (TWG). Further, in developing and refining evaluation criteria, the PEL Study Team disclosed information sources that would be used to help measure various criteria, seeking input from the TWGs if new, different, or otherwise better sources were available.

A key driver of the SR 37 PEL Study is the likelihood of sea level rise. Assumptions about sea level rise were drawn from the California OPC and BCDC. All sea level rise projections are precisely that—projections—and potentially subject to revision as the science advances.

The SR 37 PEL Study contains extensive environmental background information but is not intended to serve on its own as a substitute for environmental analysis under NEPA or CEQA. However, the planning products resulting from the SR 37 PEL Study may be adopted during subsequent environmental review process in accordance with 23 United States Code (USC) 168(d)(4). In the environmental review process, consistent with 23 USC 168(c)(2), Caltrans and its partners may adopt or incorporate by reference analyses from the SR 37 PEL Study.

BEYOND NEPA AND CEQA



The PEL process incorporates environmental, community, and economic goals early in the transportation planning process and then integrates them throughout project development, design, and construction. The purpose and need statement, range of alternatives, and other information developed during the PEL study can be utilized in the subsequent NEPA and CEQA documents, with updates as needed, saving time and money. While the PEL process was designed to streamline the NEPA process, it serves the same purposes for more efficient conduct of other state environmental protection reviews and meaningful stakeholder engagement in decision-making. The PEL process is a flexible framework that can be adapted to serve the compliance needs for many types of projects.

Beyond NEPA and CEQA, certain transportation projects in California must obtain permits from federal and state resource agencies before the project can be implemented. California Assembly Bill (AB) 1282 (Mullin 2017) established a multi-agency Transportation Permitting Task Force that defined a structured process for early engagement and coordination with resource agencies in the development of transportation projects to ensure faster and more certain permit approvals. AB 1282 also encourages the better use of advance mitigation.

Climate Action Plan for Transportation Infrastructure. Building on prior executive orders to reduce transportation greenhouse gas (GHG) emissions, the California State Transportation Agency issued the *Climate Action Plan for Transportation Infrastructure* (CAPTI) in 2021, recommending major investments of transportation dollars "to aggressively combat and adapt to climate change while supporting public health, safety and equity." The CAPTI was developed through collaboration with state agencies and hundreds of stakeholders.

California Transportation Plan 2050. Caltrans' current statewide long-range policy plan, *California Transportation Plan 2050* (CTP 2050), similarly responds to federal and state requirements to reduce transportation-related GHG emissions, build resilience to climate change, and meet future multimodal transportation needs in an inclusive and equitable fashion. CTP 2050 also emphasizes "long-held values such as improving system safety, improving mobility and accessibility, advancing environmental health and justice, and enhancing quality of life" (Caltrans 2021b: 3). At the project level, Caltrans' internal guidance for project management, highway design, and environmental analysis require consideration of climate change, sea level rise, and community impacts of projects.

Related Policies. Other policies that Caltrans may consider, while not specific to transportation, include Senate Bill 1386 (2016) for the protection of natural and working lands as a strategy to reduce GHG emissions. Equity and environmental justice are increasingly emphasized in federal and state policies and by state agencies. Regionally, BCDC's *San Francisco Bay Plan* since 2019 requires environmental justice principles be addressed in the planning, design, and permitting of shoreline projects in and along San Francisco Bay (BCDC 2019: 4), including San Pablo Bay. In addition, the Metropolitan Transportation Commission's regional transportation plan, *Plan Bay Area 2050*, highlights equity and resilience, and articulates a set of strategies that will involve collaborations by all levels of government, advocacy groups, the private sector, and the public to implement.

Photo: Stephen Joseph, SF Bay Restore

CHAPTER 2

Agency, Stakeholder, and Public Engagement

A major function of a PEL study is to gather input and build support among internal and external stakeholders for shaping a vision for a transportation corridor.

Early agency, stakeholder, and public input into the identification of transportation needs, environmental issues, and community expectations, as well as involvement in the development of broad corridor strategies, will also reduce the risk of challenges in subsequent NEPA and CEQA environmental impact analyses and permitting processes for future projects.

Periodic flooding due to rising seas and traffic congestion are known problems on the SR 37 corridor. The PEL Study Team (see Section 2.2, *PEL Study Participants*, for further details) knew that solutions would have to balance transportation needs with protecting and enhancing sensitive marshland habitats. The team recognized the opportunity to integrate multimodal bicycle, pedestrian, transit, and carpool options in a final corridor plan that also fostered equity for disadvantaged communities. The SR 37 PEL Study leverages the expertise and experience of diverse stakeholders through a collaborative process to shape considerations in the search for a range of potentially feasible alternatives for SR 37.

> "One Corridor,
> One Team,
> Many Solutions"

2.1 OUTREACH PLANNING

In November and December 2020, Caltrans conducted 20 interviews with representatives of local and regional governmental organizations, rail and transportation agencies, county parks and utility departments, federal and state agencies, environmental organizations, and sustainable transportation advocates.

Caltrans initiated stakeholder collaboration for addressing the SR 37 corridor's issues during a separate long-term corridor planning effort for the *State Route 37 Comprehensive Multimodal Corridor Plan* (Caltrans 2021), which partially overlapped with the SR 37 PEL Study. Concurrently, MTC was conducting stakeholder outreach efforts for its *SR 37 Ultimate Resilient Sea Level Rise US 101 to SR 121 Design Alternative Assessment* (DAA) (MTC 2022), which also partially overlapped the geography and timeframe of the SR 37 PEL Study. As Caltrans initiated the SR 37 PEL Study in 2020, Caltrans, MTC, and partners collaborated to align their messages for the three related efforts to seek joint public input. As their own studies advanced, each agency informed its stakeholders about the impending SR 37 PEL Study, creating a ready audience for further involvement.

Agency and stakeholder engagement specific to the SR 37 PEL Study was guided by a stakeholder outreach and public involvement plan prepared by Caltrans in 2021. The plan outlined the following two-phase approach for engaging with stakeholders.

PUBLIC INVOLVEMENT PLAN

Stakeholder priorities for the SR 37 corridor included route reliability (congestion, flooding, and sea level rise), public access, multimodal connectivity, public and active transportation options, habitat restoration, and desire for a corridor-wide vision.

2.1.1 Phase 1: Listening

Engaging with key stakeholder groups was implemented at the start of the PEL process and included interviews with stakeholders to gain insights about concerns and best ways to reach target audiences. Caltrans asked the following questions during the interviews:

- **Regarding transportation needs.** What are your or your agency/organization's transportation needs within the SR 37 corridor?
- **Regarding transportation needs.** What are the key existing conditions and/or challenges that affect your ability to meet your agency/organization's transportation needs (i.e., funding, right-of-way [ROW], permit issues)?
- **Regarding priorities.** What are your or your agency/organization's highest priorities within the corridor and why?
- **Regarding priorities.** What are the key existing conditions and/or challenges that affect your ability to meet your agency/organization's priorities (i.e., funding, ROW, permit issues)?
    - Do you have any existing plans, documents, or data that may be important to the PEL team to consider in the study that might not be readily available online (i.e., draft conservation/restoration plans, resource maps, geographic information system [GIS] data)? Please list them here or provide a contact name that our team can reach out for the information.

- What do you foresee as future conditions that will likely occur and affect the resources you and your agency/organization are interested in and/or manage (i.e., effect of sea level rise on restoration efforts, facilities or holdings)?
- What do you think the SR 37 PEL can accomplish for you or your agency/organization?
- Do you or your agency/organization have any concerns regarding the PEL study?
- What opportunities do you see for collaboration with either Caltrans or other stakeholders within the corridor? Who may be other stakeholders involved?
- Do you have any other observations or thoughts you would like to share with the PEL team?

The responses received during the interview process helped shape the outreach approach for the SR 37 PEL Study and are provided in full in Appendix B.2. Below is a compilation of key themes that emerged from those conversations.

Resiliency, Climate Change, and Sea Level Rise

- Improve route reliability, especially during wildfire evacuations and flood events, for corridor commuters, residents, and essential service industries in the area
- Develop interim projects that address flooding while not precluding long-term improvement projects
- Build resilient transportation improvements that can adapt to climate change impacts like sea level rise while minimizing throw-away infrastructure, and plan for future conditions
- Design holistic improvements to transportation infrastructure and environmental resources
- Meet mitigation goals for GHG emissions
- Reduce GHG emissions through the long-term project
- Coordinate projects between federal, state, and local agencies

Habitat Restoration and Environmental Protection

- Maintain and restore natural environmental resources like tidal marshes, habitat connectivity, and hydrology
- Analyze hydrology and associated resources in detail to understand potential risks and opportunities for transportation solutions
- Understand the changing landscape and address hydrologic impacts due to rising sea level
- Deliver projects that minimize impacts on environmental resources and the human environment

- Create a mitigation bank as a viable mitigation solution while managing various regulatory requirements
- Consider innovative building materials to provide additional habitat protection and restoration opportunities (e.g., pavement, lighting, other materials, active levee management)
- Allow and design for improved species movement

Multimodal

- Improve and increase connectivity of bicycle and pedestrian paths in the corridor
- Improve and expand public transportation options (e.g., rail, bus)
- Maintain railroad conditions for ongoing short line freight railroad transport. Improve railroad conditions for improved freight rail transport and commuter rail services to connect to the national railroad network and the State of California supported passenger rail services.
- Implement high-occupancy vehicles (HOV) to improve bus and carpool transit
- Improve multi-modal east-west transportation to connect I-80 corridor with US 101 corridor to reduce dependence on single-occupancy cars and vehicle miles traveled (VMT)

Traffic & Congestion

- Address congestion in the short term and build towards the long-term solution
- Ensure sufficient capacity to address congestion issues
- Reduce VMT
- Consider pandemic and post-pandemic traffic patterns and travel demand
- Increase efficiency of SR 37

Equity

- Consider the cost of housing and location of jobs which further exacerbates equity issues along the corridor; a potential solution to consider is to provide affordable housing where the jobs are located instead of widening the road
- Conduct an equity study to further understand equity issues and address disadvantaged communities along the corridor. Appropriately incorporate findings into any consideration of tolling within the corridor
- Ensure environmental justice is adequately addressed in the PEL process to avoid indirect impacts on disadvantaged communities

Access

- Maintain safe access to existing and planned public and private facilities along the corridor
- Improve public access to and educational opportunities to explore natural environmental resources within the corridor
- Develop access plan early in the design stage that allows for pedestrian safety and access while minimizing impacts to thru traffic
- Increase ability of SR 37 users to access resources along the corridor
- Increase public parking at public access locations
- Incorporate water-oriented recreation opportunities

Education

- Foster outreach, education, and accessibility to the natural resources surrounding the corridor
- Engage communities and education of the needs, changing landscape, and solutions within the corridor
- Inform the public of opportunities within the corridor by creating a public access map that includes federal, state, and local parks, trails, docks, etc.

Safety

- Improve route reliability, especially during wildfire evacuations and flooding events, for corridor commuters, residents, and essential service industries in the area
- Ensure safe bike and recreational access

Funding and Collaboration

- Identify funding that can be used for transportation improvements and habitat restoration
- Develop transportation solutions consistent with existing county and master plans
- Utilize the PEL process to build collaboration and a coalition of agencies and stakeholders
- Produce a corridor vision that includes design elements that build toward a long-term solution while recognizing the need for habitat restoration and long-term land use
- Maintain strong stakeholder and public involvement, and strong communication lines throughout the PEL process
- Build relationships and project familiarity to help the permitting process with regulatory agencies
- Identify different funding sources to provide the necessary money to construct sooner

2.1.2 Phase 2: Outreach and Education—Public Information Methods and Activities

In this phase, the PEL Study Team applied what they learned about stakeholders and community concerns in Phase 1 to shape priorities for outreach and education. It was important to communicate project goals, milestones, and decisions as the study moved forward. Stakeholders were engaged with online surveys, one-on-one interviews, and focus group meetings (all virtual) to capture their interests, goals, issues, and what they hoped to accomplish with the SR 37 PEL Study.

This phase also included a number of one-off meetings during which Caltrans presented status updates to various agencies and organizations.

2.2 PEL STUDY PARTICIPANTS

The PEL Study Team consisted of Caltrans traffic, roadway design, engineering services, planning, project management and environmental staff, and consultants. The PEL Study Team employed the management structure established in the 2015 MOU to engage and coordinate the diverse array of agencies and organizations with a stake in the SR 37 corridor. This included a Policy Committee; an Executive Steering Committee (ESC); and a Project Leadership Team (PLT).

- The Policy Committee is composed of elected officials with jurisdictions in the SR 37 corridor.
- The ESC consisted of the executive directors of Caltrans, MTC, and the four county transportation agencies and provided strategic direction to the Policy Committee and the PLT.
- The PLT consisted of the managers and staffs of Caltrans, MTC, Transportation Authority of Marin, Sonoma County Transportation Authority, Napa Valley Transportation Authority, and Solano Transportation Authority. This team vetted technical, policy, and other related project issues and elevated them as appropriate to the ESC.

PEL STUDY PARTICIPANTS

Stakeholder Working Group

Resource Agency Partners

Technical Working Groups

- Design
- Environmental
- Traffic

General Public

The PEL Study Team established a Stakeholder Working Group (SWG), a Resource Agency Partners Group (RAP), and three TWGs consisting of Design, Environmental, and Traffic. A full list of participants in these groups is provided in Appendix B, *State Route 37 Corridor Planning and Environmental Linkages Study Agency, Stakeholder, and Public Outreach and Participation*. Themes, issues, and ideas generated in the working groups were presented to the leadership teams, and their feedback guided subsequent decisions and processes. During development of the SR 37 PEL Study vision, goals, need and purpose, the PEL Study Team gathered information which they then presented to the SWG, followed by the PLT, ESC, and finally the Policy Committee. As the SR 37 PEL Study alternatives and evaluation criteria were developed, the PEL

Study Team presented information to the TWGs, who reviewed and discussed this information and provided feedback to the PEL Study Team. This process was iterated with the TWGs several times for most topics. After the PEL Study Team determined that the recommendations were sufficiently advanced, this information was then presented to the SWG for review and comment. Throughout this process the PEL Study Team provided regular status updates regarding the SR 37 PEL Study to the PLT and solicited input on technical issues as needed. After the PEL Study Team determined that the recommendations were fully vetted, the PEL Study Team then presented recommendations to the ESC for concurrence and ultimately the Policy Committee.

The PEL Study Team sent targeted outreach letters to the RAP, SWG, and TWG participants, agency public information officers, community-based organizations, and disadvantaged community groups. These letters encouraged them to reach out to their constituents and communities to inform them of the SR 37 PEL Study process and opportunities for engagement. Outreach letters included notice of public meetings and sample messages for newsletters, email postings, and social media. At meetings and workshops, Caltrans continued to encourage participants to keep their constituencies informed.

2.2.1 Stakeholder Working Group

The SWG consisted of those who would be affected by the project in some way: residents, businesses, representatives of Native American Tribes, community and environmental organizations, and federal, state, and local agencies. Some of these stakeholders also participated in TWGs. The role of the SWG was to inform the PEL process, review progress, and provide direction for equity, consistency with local corridor needs, and areas of jurisdiction. They also served as credible messengers to their communities and constituencies. The SWG eventually consisted of 185 individuals and representatives of 71 organizations.

2.2.2 Resource Agency Partners

The RAP group was formed to foster agency collaboration with Caltrans, in a role similar to that of a NEPA cooperating agency. The core RAP participants consisted of representatives from BCDC, the San Francisco Bay Regional Water Quality Control Board, California Department of Fish and Wildlife, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), U.S. Coast Guard (USCG), and National Marine Fisheries Service (NMFS). In addition to the core RAP participants, the MTC, Transportation Authority of Marin, Sonoma County Transportation Authority, Napa Valley Transportation Authority, and Solano Transportation Authority participated during the initial engagement of the RAP. RAP members provided expertise in their areas of jurisdiction to help ensure that the interests and regulations of their agencies were met. The RAP provided continuity, participation, and input from the resource and transportation agencies, complementing and supporting the TWGs and the PEL Study Team. Input from the RAP was particularly valuable in the implementation planning described in Chapter 8, Implementation Plan.

2.2.3 Technical Working Groups

The TWGs consisted of key Caltrans traffic, roadway design, engineering services, planning, project management, and environmental staff; consultant technical experts; corridor representatives from local jurisdictions' Public Works and Open Space staff, as well as representatives of environmental organizations with expertise in the topics being discussed. This group advised and guided technical aspects of the SR 37 PEL Study. The PEL Study Team members could call upon their specific expertise as needed. Three topic-specific TWGs—Design, Environmental, and Traffic—were tasked with reviewing materials; providing expertise, insights, and recommendations; and participating in small group meetings. At facilitated meetings, each TWG discussed targeted questions in the context of the themes identified in the purpose statement: resiliency to sea level rise and extreme events; reliable travel time and increased vehicle occupancy; bicycle and pedestrian safety; public access and connectivity; and equitable transit and multimodal transportation solutions.

- The Design TWG discussed design standards and concepts, typical cross-sections, potential alignments, transit and access considerations, movement and functionality, constructability, and costs of construction and operation.
- The Environmental TWG provided expertise in environment, Tribal consultation, maintenance, ROW, and sea level rise.
- The Traffic TWG experts provided traffic modeling and insights into roadway operations and maintenance.

Participant Support

Caltrans was gratified to receive letters of support for the PEL process from many of the agencies and organizations that participated. These letters typically endorsed the outreach and stakeholder engagement conducted for the SR 37 PEL Study and the vision established through that collaboration, the range of solutions considered, and the recommendation for Alternative 5 as the preferred alternative for the SR 37 corridor. The letters received as of the completion of the SR 37 PEL Study are collected in Appendix L, *Letters Received from Participating Agencies and Organizations.*

"Caltrans conducted a robust public outreach process, which drew a large number of constituents to public meetings and enhanced dialogue and input from affected communities and users. This has led to effective outcomes that address the complex transportation and environmental considerations associated with a resilient, next generation corridor." – MTC

"We had the pleasure of participating in the SR 37 PEL study process as community members affiliated with a local environmental organization. The process was very informative, collaborative and refreshingly inclusive. We felt concerns were heard and incorporated in the analysis, and ultimately in the recommendation." – Marin Conservation League

2.2.4 General Public

Contact List

The PEL Study Team compiled and maintained a contact list of more than 600 participants that included community organizations, local and regional groups, elected officials, local, state, and federal agencies, and persons who attended public meetings, submitted comments to Caltrans through the SR 37 email inbox, or asked to be added to the SR 37 mailing list. This contact list was updated during the SR 37 PEL Study development period. The PEL Study Team distributed meeting announcements and study updates to this list at regular intervals.

Public Comment Database and Interactive Map Tool

Virtual public meetings were held to share materials developed by the PEL Study Team and working groups with the public and to gather input. Caltrans maintained the Resilient SR 37 project website (available at: https://dot.ca.gov/caltrans-near-me/district-4/d4-projects/d4-37-corridor-projects/) and updated it regularly to share SR 37 PEL Study information. In addition, Sonoma County Transportation Authority set up and administered the Resilient SR 37 website (available at: https://scta.ca.gov/resilient37/) with links to its own corridor-related meetings and events and to the Caltrans SR 37 website.

The Caltrans Resilient SR 37 website included an interactive web map that allowed the public to comment and to opt in to receive future outreach communications (Figure 2-1).

The PEL Study Team reviewed public comments from the survey and web map bi-weekly and incorporated ideas and feedback during the Level 1, 2, and 3 alternative screening analyses. A telephone hotline and email inbox were set up to take comments on the SR 37 PEL Study. A Caltrans public information officer or member of the PEL Study Team reviewed and responded to messages or questions submitted via the hotline as they did for the survey and web map. Comments collected through these tools and all other means were preserved in a public comment database maintained by Caltrans.

Figure 2-1. SR 37 Interactive Map Tool

2.3 MEETINGS

The PEL Study Team distributed meeting invitations and information prior to each meeting so participants were aware of the meeting content and expectations. For public meetings, the PEL Study Team and Caltrans District 4 Public Information Office posted meeting information and SR 37 PEL Study information to Facebook and Twitter and distributed press releases to local media outlets to garner publicity. Meetings were held on the Zoom or Webex platforms, generally starting with introductions, moving on to presentations that were each followed by a question and comment period, and ending with a meeting wrap up. Participants could use the Q&A and chat features to ask questions or comment. Chat monitors compiled questions into themes for presenters to answer. When necessary for time management, two minutes per person were allocated for verbal questions and comments to allow time for the PEL Study Team to respond to each and to give as many participants as possible an opportunity to contribute. Presentations and meeting summaries including the online questions and comments were distributed to participants following the respective meetings. Participants were periodically asked to complete "homework" assignments to provide substantive input for consideration by the PEL Study Team or for further review and discussion at a subsequent meeting.

2.3.1 Stakeholder Working Group

SWG meetings were scheduled on average every two months, but were also held as needed for specific milestones or in coordination with other studies. Caltrans presented two PEL training sessions to local stakeholders and transportation agencies in November 2020, as well as tailored training sessions for the Yocha Dehe Wintun Nation and the Federated Indians of Graton Rancheria. Presenters provided background and context of a PEL, the PEL process, why Caltrans was leading one for SR 37, and how participants could get involved in the SWG. A complete list of SWG members is provided in Appendix B.

The first SWG workshop was held December 10, 2020. Caltrans invited 140 stakeholders to attend, and 55 participated. Caltrans presented additional SR 37 corridor baseline information and details on projects planned along the corridor. In seven breakout rooms, participants discussed sea level rise adaptation, traffic and congestion, multimodal transportation, restoration and ecology, equity, access, land use, recreation, and utilities. Twenty-three stakeholders were interviewed and 23 responded to an online survey. Participant input mirrored many of the concerns expressed in earlier surveys and interviews.

Word Cloud of Stakeholder Concerns

Eight more SWG workshops followed from January 2021 through September 2022, as shown in Table 2-1. Meetings generally opened with introductions, focused on a main agenda topic that guided discussion, followed by question and answer sessions and discussion of next steps. Some meetings featured breakout group discussions that were then reported back to the full group. Many meetings ended with homework assignments for the participants to provide feedback or prepare for the next meeting. Example presentations are provided in Appendix B.

Table 2-1. Stakeholder Working Group Workshop Summary

Workshop	Date	Main Agenda Topic
	November 12, 2020, and November 16, 2020	SR 37 PEL Introduction and Training Presentation
1	December 10, 2020	Corridor Setting Current Projects/Studies Breakout Groups for Corridor Needs Discussion
2	March 26, 2021	SR 37 PEL Draft Purpose and Need Statement Breakout Groups for Purpose and Need Discussion

Workshop	Date	Main Agenda Topic
3	July 30, 2021	Status of the PEL Study and SR 37 Corridor Meetings PEL Schedule Draft Purpose Statement and Goals Evaluation Criteria Process DAA (*SR 37 Ultimate Sea Level Rise Resilient Corridor: US 101 to SR 121*)[a]
4	September 24, 2021	Sonoma-Marin Area Rail Transit Presentation PEL Study Status PEL Purpose Statement and Response to Comments Design Alternatives Assessment Update
5	December 10, 2021	PEL Study Status PEL Technical Working Group Updates PEL Initial Evaluation Criteria and Preliminary Range of Alternatives Design Alternatives Assessment Update
6	March 25, 2022	Public Meeting (1/25/2022) Highlights Study Elements in Progress Level 1 Evaluation Criteria on Preliminary Alignments and Modes Prospective Level 2 Criteria
7	May 26, 2022	Level 2 Screening ▪ Criteria and Methodology ▪ Preliminary Recommendations
8	August 12, 2022	Level 3 Screening ▪ Criteria and Methodology ▪ Observations ▪ Preliminary Recommendations
9	September 30, 2022	Preferred Alternative (Alternative 5) ▪ Summary of Comments Interactive Review for Sensitive Areas, Access, Hydrologic Conditions, Facility Location, and Data

DAA = *State Route 37 Ultimate Sea Level Rise Resilience Design Alternatives Assessment Marin–Sonoma (US 101 – SR 121)* (Metropolitan Transportation Commission 2022)
MTC = Metropolitan Transportation Commission
PEL = Planning and Environmental Linkages
SR = State Route
[a] The PEL Study Team and MTC, who led the DAA, closely collaborated on content and messaging during the period in which the DAA and SR 37 PEL Study overlapped. As part of this coordination, meetings held for both the PEL and the DAA frequently included updates regarding their respective studies to keep robust lines of communication open with as many stakeholders as possible.

2.3.2 Resource Agency Partners

As had been done for the SWG, Caltrans presented two trainings to 31 RAP members in November 2020 to introduce the PEL concept in general, the vision for SR 37, and the SR 37 PEL Study in particular. Seven more meetings took place from January 2021 through November 2022 (Table 2-2). RAP meetings, held on the Webex platform, were intended to share information and encourage engagement with productive comments and questions.

Table 2-2. Summary of Resource Agency Partners Meetings

Meeting	Date	Main Agenda Topic
1	January 29, 2021	Goals of the PEL Study Roles and Responsibilities of the Resource Agency Partners Regulatory Context – PEL, NEPA/CEQA, permits Key Issues and Opportunities from SWG Discussions PEL Assumptions Coordination with Ongoing Studies and Projects (DAA, others)
2	February 26, 2021	Review Previous Studies and Data Sources ▪ Sea Level Rise ▪ Plans and Alternatives ▪ Travel and Transit SR 37 Corridor Ultimate Resilience Project Draft Purpose
3	June 11, 2021	Status and SR 37 Corridor Meetings Mapping tool PEL Schedule Draft Purpose Statement and Goals Evaluation Criteria Process DAA Alternatives US 101 to SR 121
4	August 27, 2021	PEL Schedule PEL Purpose Statement PEL Evaluation Criteria DAA Update Update on Interim Projects and Meetings
5	October 29, 2021	SR 37 Corridor Final Purpose Statement PEL Technical Working Group Updates ▪ Environmental TWG ▪ Design TWG ▪ Traffic TWG DAA US 101 to SR 121 ▪ Evaluation of Alternatives ▪ Methodology Overview ▪ Assessment Results
6	July 29, 2022	PEL Study Status PEL Study Evaluation Criteria Letters of Support
7	October 14, 2022	Preferred Alternative (Alternative 5) Discussion of Prospective Implementation Approaches
8	November 18, 2022	Review of Revised Draft PEL Implementation Plan

PEL = Planning and Environmental Linkages
NEPA/CEQA = National Environmental Policy Act/California Environmental Quality Act
DAA = *State Route 37 Ultimate Sea Level Rise Resilience Design Alternatives Assessment Marin–Sonoma (US 101 – SR 121)* (Metropolitan Transportation Commission 2022)
TWG = technical working group

2.3.3 Technical Working Groups

Early Environmental TWG meetings fostered discussion of potential PEL evaluation criteria related to ecological resilience and benefits; environmental impacts; and equitable transportation solutions. As Level 1 evaluation criteria were developed, later meetings introduced the seven principles of landscape resilience framework to all the TWGs. At subsequent TWG meetings, the PEL Study Team asked participants to consider preliminary alignments and modes in light of Level 1 criteria focused on purpose and need. Meeting topics then moved on to discussing proposed Level 2 evaluation criteria for design, environmental, and traffic, incorporating equity considerations at each stage. Tables 2-2 through 2-6 summarize the main agenda topics covered at TWG meetings. At some meetings, agendas were the same for all three TWGs.

PRINCIPLES OF THE LANDSCAPE RESILIENCE FRAMEWORK

1. Setting
2. Process
3. Connectivity
4. Diversity and Complexity
5. Redundancy
6. Scale
7. People

Table 2-3. Summary of Design Technical Working Group Meetings

Meeting	Date	Main Agenda Topic
1	October 14, 2021	Kick-off ▪ Final Purpose and Need Statement ▪ Overarching questions to be addressed by the PEL ▪ Questions to be addressed by the Design TWG ▪ Discussion on potential PEL evaluation criteria related to the design topics
2	November 18, 2021	How this TWG supports the SR 37 PEL Study Final Purpose and Need statement Review of initial evaluation criteria Initial alternatives for consideration in the SR 37 PEL Study
3	December 16, 2021	SR 37 PEL Study Status Review of refined evaluation criteria Review of preliminary range of alternatives
4	February 17, 2022	Meeting Objectives ▪ Set the framework for meaningful feedback ▪ Solicit TWG input on Level 1 evaluation criteria ▪ Establish process for additional input through "homework" Recap of January 25 Public Meeting SR 37 PEL Study Status Group Exercise: Applying Level 1 Evaluation Criteria to Preliminary Alignments

Meeting	Date	Main Agenda Topic
5	March 8, 2022—Design March 9, 2022—Environmental March 10, 2022—Traffic	Summarize where we are with the SR 37 PEL Study; what comes next Seek feedback on results of Level 1 Screening Analysis on Preliminary Alignments/Modes Discuss Design Considerations and Analysis Needs Review Prospective Level 2 Criteria Summary and Next Steps
6	May 10, 2022—Design May 11, 2022—Traffic May 12, 2022—Environmental	All TWGs: Summarize where we are with the SR 37 PEL Study; what comes next Recaps of Level 1/Level 2 Work to Date ▪ Level 1 Screening Decisions ▪ Final Level 2 Criteria Design TWG: Working Session: Apply Level 2 Criteria to Alternatives ▪ Review of Design Standards and Typical Sections ▪ Review of Level 2 Criteria Methodology and Initial Observations ▪ Input and Feedback from TWG Members Environmental TWG: Working Session: Apply Level 2 Criteria to Alternatives ▪ Review of Level 2 Criteria Methodology and Initial Observations ▪ Input and Feedback from TWG Members Traffic TWG: Working Session: Apply Level 2 Criteria to Alternatives ▪ Review Initial VMT Calculations All TWGs: Summary and Next Steps
7	June 21, 2022—Environmental June 22, 2022—Design June 23, 2022—Traffic	Summarize where we are with the SR 37 PEL Study; what comes next Summary overview of Design to date ▪ Design feedback from TWG and SWG May meetings Recap of Level 2 Screening Recommendations Overview of Draft Level 3 Criteria

Table 2-4. Summary of Environmental Technical Working Group Meetings

Meeting	Date	Main Agenda Topic
1	October 12, 2021	Kickoff: ▪ Final Purpose and Need Statement ▪ Overarching questions to be addressed by the PEL ▪ Questions to be addressed by the Environmental TWG ▪ Discussion on potential PEL evaluation criteria related to the environmental topics
2	November 16, 2021	How this TWG supports the SR 37 PEL Study Reminders ▪ Final Purpose and Need Statement Review of initial evaluation criteria Initial alternatives for consideration in the SR 37 PEL Study

Meeting	Date	Main Agenda Topic
3	December 14, 2021	SR 37 PEL Study Status ▪ Public Outreach Review of Refined Evaluation Criteria Review of Preliminary Range of Alternatives Next Steps
4	February 15, 2022	SR 37 PEL Study Status Group Exercise: Applying Refined Level 1 Evaluation Criteria to Preliminary Alignments Summary and Next Steps
5	March 9, 2022	Same as Design TWG meeting
6	May 12, 2022	Same as Design TWG meeting
7	June 21, 2022	Same as Design TWG meeting

PEL = Planning and Environmental Linkages
SR = State Route
TWG = technical working group

Table 2-5. Summary of Traffic Technical Working Group Meetings

Meeting	Date	Main Agenda Topic
1	October 15, 2021	Kickoff: ▪ How this TWG supports the SR 37 PEL Study ▪ Final Purpose and Need Statement ▪ Overarching questions to be addressed by the SR 37 PEL Study ▪ Questions to be addressed by the Traffic TWG ▪ Discussion on Potential PEL Evaluation Criteria related to traffic
2	November 19, 2021	How this TWG supports the SR 37 PEL Study Reminders Final Purpose and Need Statement Review of initial evaluation criteria Initial Alternatives for consideration in the PEL Study
3	December 15, 2021	SR 37 PEL Study Status Context for Today's Meeting on Regional Traffic Demand Projections for 2050 Presentation from Fehr & Peers on Demand Projection Efforts to Date
4	January 12, 2022	Preliminary Traffic Forecasts
5	February 16, 2022	SR 37 PEL Study Status Group Exercise: Applying Level 1 Evaluation Criteria to Preliminary Alignments
6	March 10, 2022	Same as Design TWG meeting
7	May 11, 2022	Same as Design TWG meeting
8	June 23, 2022	Same as Design TWG meeting

PEL = Planning and Environmental Linkages
SR = State Route
TWG = technical working group

Table 2-6. Plenary Technical Working Group Meetings

Date	Main Agenda Topics
July 27, 2022	SR 37 PEL Study Progress and Status Level 3 Screening ▪ Overview of Approach ▪ Preliminary Assessments ▫ Key Differentiating Criteria ▫ Other Criteria Next Steps ▪ Upcoming Meetings ▪ Anticipated PEL Reporting Discussion
September 7, 2022	Alternative 5 ▪ Summary of comments Interactive Review for Sensitive Areas, Access, Hydrologic Conditions, Facility Location, and Data Alternatives ▪ Broad support for Alternative 5 (preferred alternative) Design Considerations Considerations for CEQA/NEPA analysis Corridor walk-through

CEQA/NEPA = California Environmental Quality Act/National Environmental Policy Act
PEL = Planning and Environmental Linkages
SR = State Route

Key questions for the Design TWG included the functional classification and design standards of the future SR 37 corridor and design speed. Causeway, embankment, floating bridge, ferries, tunnel, and overwater solutions were analyzed and compared. Advantages and disadvantages of peak period shoulder lanes, bicycle and pedestrian, and rail options that could be applied to any alternative were considered.

By the May 2022 TWG meetings, modifications to final Level 2 screening criteria for design, environmental, and traffic were presented along with answers to previous questions of functional classification (expressway), design speed[1] (70 mph), and design standards for critical design elements. Sea level rise assumptions were finalized. The Design TWG could then apply Level 2 design criteria to conceptual layouts for each alignment being carried forward as an alternative and options for transit, bicycle and pedestrian facilities, and rail. Environmental evaluation criteria could similarly be applied as design factors developed. The Environmental TWG evaluated alternatives for how well they allowed future habitat transitions, landward marsh

[1] The posted speed is expected to be 60 mph. "Design speed is used in selecting the vertical and horizontal elements for new roadways while speed limits are based on a statistical analysis of individual vehicular speeds. At some locations, the posted speed limit based on an 85th percentile speed exceeds the roadway's design speed. This situation is a result of the fact that criteria used in highway design incorporate a significant factor of safety – i.e., roadways are designed for near worst-case conditions." (Fitzpatrick et al. 1995)

migration, terrestrial connectivity, and incorporation of nature-based solutions to protect both infrastructure and ecological resilience. The Traffic TWG focused on criteria for evaluating each alternative for change in VMT, changes in travel patterns and travel time reliability, rail compatibility, emergency and evacuation use, and access to recreational resources. All TWGs considered aspects of equity as they applied each criterion to evaluate alternatives and options. The June 2022 meetings presented draft Level 3 evaluation criteria and similarly requested feedback from TWG members (Chapter 6, *Alternatives Evaluation Criteria*).

Chapter 7, *Alternatives Screening and Identification of the Preferred Alternative*, describes how alternatives were evaluated and selected to be carried forward or eliminated from consideration.

2.3.4 General Public

The SR 37 PEL Study public outreach kicked off in November 2020 and concluded in September 2022. Public meetings were held to introduce the SR 37 PEL Study, educate the public on the PEL process, and collect their input on a vision for the highway, interchanges, and related concerns. Public notices and information went out to more than 600 participants via email blasts, news releases, media outreach, website updates, collateral materials, and social media. Caltrans also posted a link to meeting information on changeable message signs along the corridor for at least two weeks prior to each public meeting. The Caltrans legislative team coordinated with local officials to identify underserved communities and ensure they were aware of and engaged in the SR 37 PEL Study process. The PEL Study Team followed up with these communities or organizations that serve them with personal email messages prior to the 2022 public meetings to encourage their participation. Public meeting announcements were available in English, Spanish, and Tagalog and translation was provided at the meetings.

> Public meeting notices in English, Spanish, and Tagalog went out to more than 600 members of the public plus local officials and community organizations.

The PEL Study Team provided briefings on the SR 37 PEL Study process and its benefits, and baseline information on the corridor and planned projects, to local and Tribal officials, project partners, and transportation and regulatory agencies. Learning about these groups' perceptions, concerns, and ideas about the project early on helped to identify opportunities and priorities for further outreach and education tools. Engagement with these representatives fostered awareness of the project and became a conduit for disseminating project information to their constituencies and associated groups.

Virtual Public Meetings

Given that the study period occurred between 2020 and 2022 during the coronavirus disease (COVID-19) pandemic when group gatherings were discouraged, input was collected via online

survey, direct interviews, and virtual meetings using the Zoom platform. Caltrans and the PEL Study Team managed ongoing stakeholder involvement through key milestone meetings as the PEL steps advanced, establishing and maintaining an active, informed, and influential stakeholder base for the duration of the study.

The Caltrans Public Information Office provided media contacts including Spanish-language media, churches, schools, and community groups. Caltrans staff also contacted those with known involvement in the corridor, or likely involvement based on the scope of the PEL. The contact list eventually resulted in more than 600 participants that were notified of public meetings, survey opportunities, and ways to participate and offer input.

Caltrans held three virtual public meetings, on May 26, 2021, January 25, 2022, and September 14, 2022. Presentations included speakers, PowerPoint presentations, videos, landscape flyovers, sea level rise simulations, interactive polls, and opportunities to submit questions and comments. After the meetings, Caltrans sent follow-up emails and posted meeting recordings, presentations, and written meeting summaries on the Caltrans SR 37 Corridor website and the Resilient SR 37 website. Appendix B provides details of each meeting.

Figure 2-2. Resilient SR 37 Website Landing Page

April 15, 2021 Town Hall Meeting

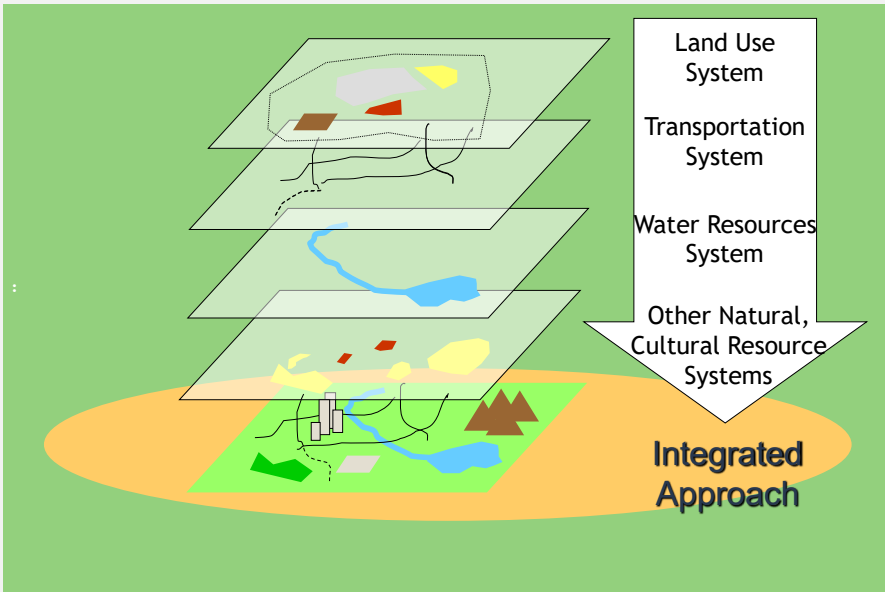
Senators Bill Dodd and Mike McGuire hosted a town hall meeting on April 15, 2021, with the theme of *Solutions, Strategies, and Your Role in Shaping Highway 37's Future*. Caltrans staff participated to share information about short-term projects and the long-term solution for SR 37. Caltrans staff presented options for short-term fixes for flood and congestion relief, discussed issues and opportunities for long-term solutions, requested public input, and discussed next steps

for work within the corridor. The SR 37 PEL Study was introduced at this meeting, and public participation opportunities were discussed. The team also shared other corridor-focused studies: MTC's DAA, the SR 121 to Mare Island DAA, and Caltrans' *Comprehensive Multimodal Corridor Plan*. Participants were asked to provide thoughts on the SR 37 PEL Study potential purpose statement and possible alignment options. Participants were also invited to fill out an online questionnaire (www.Resilient37.org/Questionnaire) to help develop a range of alternatives, and shown how they could provide input throughout the SR 37 PEL Study process, including through the StateRoute37@dot.ca.gov email.

Public Meeting #1

Caltrans hosted the first public meeting on May 26, 2021, to introduce the SR 37 PEL Study and explain how it related to other ongoing work in the corridor (Figure 2-3). Meeting notices were provided in English, Spanish, and Tagalog. Caltrans staff presented the draft purpose, need, and goals for the study, the alternatives development and evaluation processes, and a general timeline for study completion. They demonstrated the SR 37 Public Comment Web Map, and showed simulations of how sea level rise would affect the corridor by 2100. Another part of the presentation focused on the ecological and hydrological importance of the San Pablo Baylands. Other discussions covered multimodal opportunities for the corridor, access, and equity. Participants then had an opportunity to question an interagency panel consisting of staff from Caltrans, MTC, and the four North Bay transportation agencies.

Figure 2-3. Conceptual Diagram of Integrated Approach (Presented October 20, 2020)



Public Meeting #2

The second public meeting was held on January 25, 2022. At this meeting, after the general SR 37 PEL Study introduction and overview, Caltrans staff and consultants presented video simulations of eight preliminary alignments. Presenters also described alternative transportation modes under consideration: floating bridge, ferries, rail and auto train options, tolling, and tunnel. The more than 300 participants were encouraged to enter questions and comments in the Zoom chat box. After the presentation, the Caltrans team addressed the chat comments and participants were then invited to ask questions verbally, to which the team responded. Content, questions, and answers were translated in real time from English to Spanish and Tagalog. The meeting summary identified the themes that emerged from

the public comments, including alignments, additional travel modes, bicycle and pedestrian access, public transit needs, congestion reduction, housing, tolling, VMT, sea level rise, impacts on disadvantaged communities, travelers' origin and destination, impacts on business and landowners on SR 37, BCDC alignment considerations, and cost. The meeting presentation and recording were then posted to the PEL webpage of the SR 37 website in English, Spanish, and Tagalog.

Public Meeting #3

The third virtual public meeting was held on September 14, 2022. Of 133 participants logged into the Zoom webinar, 90 appeared to be members of the public. This meeting focused on the work of the SR 37 PEL Study to date: reviewed purpose and need, the proposed alignments, the alternatives screening process, and evaluation of alternatives. It reviewed the sea level rise projections and explained how the SR 37 PEL Study would inform future environmental review for NEPA and CEQA. Presenters discussed the involvement of the SWG and TWGs in creating evaluation criteria and screening alternatives, and reviewed the evaluation criteria and three levels of screening completed that resulted in selection of Alternative 5 as the preferred alternative. The presenter explained the components and attributes of Alternative 5, illustrated with a diagram of an elevated highway (causeway) with four lanes, shoulders to accommodate bus-on-shoulder during peak periods, and bicycle and pedestrian access envisioned as the concept of the preferred alternative. The hosts then invited participants' comments and thoughts. As with previous meetings, simultaneous interpretation in Spanish and Tagalog was available and participants were encouraged to use the chat box to post questions and comments, which were later answered by presenters. The last slide presented the other media through which comments could be submitted, providing project email, phone line, interactive map, and the website. New themes that emerged from the comments during the Zoom webinar included merits of the project, support for Alternative 5 as the preferred alternative, safety and seismicity, other Caltrans projects, and Bay Area transportation needs. Other concerns were similar to those raised in Public Meeting #2.

As seen in the following chapters, agencies, stakeholders, and the public were essential contributors to the development of the SR 37 PEL Study purpose and need, alternatives, and alternatives evaluation process that resulted in a viable plan for the SR 37 corridor.

CHAPTER 3

Vision, Purpose, and Need

Establishing a vision for the SR 37 PEL Study was the first step for the PEL Study Team in its collaboration with stakeholders in gaining general concurrence on long-range goals and forecasts for needs of the transportation corridor.

After the vision was established, the PEL Study Team solicited feedback from stakeholders to develop a set of goals that would assist with developing alternatives that could achieve the vision. The next and final step, prior to identifying potential alternatives for consideration, consisted of further collaboration with focus groups to assess and document the purpose and need for the SR 37 PEL Study. This chapter describes key processes and issues that the PEL Study Team considered while developing the vision, goals, need, and purpose for the SR 37 PEL Study. Appendix A, *State Route 37 Corridor Planning and Environmental Linkages Study Vision, Goals, and Purpose and Need Memorandum*, provides additional details.

The SR 37 PEL Study purpose and need statement aligns with the Caltrans mission to provide a safe and reliable transportation network that serves all people and respects the environment while considering and complementing other key goals and objectives for the region. It also is consistent with the directive to "identify and describe the proposed action and the transportation problem(s) or other needs which it is intended to address" (23 CFR Part 450, Appendix A).

3.1 SR 37 PEL STUDY VISION

The PEL Study Team began developing the vision for the SR 37 PEL Study through a series of meetings with stakeholders in late 2020 and the general public in early 2021. The PEL Study Team gathered information from the SWG related to topics such as cultural resources, recreation, transportation, and community interests. From the RAP, the PEL Study Team collected information related to transportation, biological and hydrological resources, water quality, and other resources. In addition, the TWGs provided input on design, such as feasible alternatives, design concepts, and mechanisms to support multimodal transportation options; on environmental factors such as sea level rise and ecological connectivity and function; and on traffic, such as metrics to characterize corridor capacity, VMT, and GHG emissions.

Issues and Opportunities Word Cloud

Based on collaboration with the SWG, RAP, and TWGs, the PEL Study Team identified the following key themes to hone the vision for the SR 37 PEL Study.

- **Resiliency, climate change, and sea level rise.** The SR 37 corridor currently experiences flooding during winter rains and high tide events, with closures happening with increasing frequency. With the roadway's low-lying elevation and proximity to San Pablo Bay and marshes and the ever-increasing threat of sea level rise, the SR 37 corridor will experience increasing direct impacts from flooding and storm surge, further hindering transportation on a corridor that is already congested and affected by weather and tide. Section 1.3.1, *Climate Change Won't Wait*, discusses the stressors that climate change is placing on the Study Area in greater detail.
- **Lack of multimodal options.** Users of the SR 37 corridor currently have no transit or other options besides single-occupancy vehicles. This lack of multimodal opportunities exists despite the high rate of corridor use for commuting between the east, where much of the region's affordable housing exists, and the areas north and west, where job opportunities exist. Congestion between Vallejo and Sears Point inhibits providing transit access because with the current highway configuration of only one lane in each direction, there is no potential to reduce travel time.
- **Traffic and congestion.** Travel time reliability is especially important in this regional corridor, where motorists and freight that need to arrive at their destinations on time traverse long distances without viable parallel routes. Despite this need for travel time reliability, corridor users experience weekday travel times that fluctuate widely, varying between 20 minutes under free-flow conditions and 120 minutes or more during times of congestion.
- **Ecological restoration and conservation**. As described in Section 1.3, *SR 37 PEL Study Background*, the current construction of SR 37 on a long embankment is an impediment to restoration work. Removing the embankment will create opportunities for habitat

restoration that have previously been hindered. Such habitat restoration can serve as a bulwark against climate change (sea level rise).

- **Equity**. SR 37 is known to be an important route for lower-income people residing in Solano County to access jobs in Sonoma, Marin, and points south. The transportation deficiencies of this corridor thus disproportionately affect lower-income populations.
- **Access.** A number of locations along SR 37, including public lands, private driveways, and business properties, are only accessible from SR 37. These access points should be maintained, to the extent made possible by climate change, regardless of alternative.
- **Education.** The PEL Study Team had and continues to have the opportunity to educate stakeholders and the public about issues in the corridor and the tradeoffs involved in responding to climate change.
- **Safety.** The SR 37 corridor serves as an evacuation route; however, the route can be prone to closure due to both flood events and wildfires. Further, SR 37 is currently open to bicycles but there is potential for conflicts between vehicular and bicycle traffic given the existing roadway design and lack of dedicated bicycle facilities.

> The PEL Study Team found broad alignment in values, principles, and desired outcomes for the SR 37 corridor among stakeholders and the public at large.

- **Funding availability**. It is important to understand funding options for this 21-mile corridor and to agree on priorities for spending resources where they will serve the most acute needs and address the most urgent concerns.
- **Collaboration with regional partners.** Participants in the vision process agreed that continued collaboration among all stakeholders and project partners will be key to the success of the SR 37 PEL Study.

Through its engagement efforts, the PEL Study Team found broad alignment in values, principles, and desired outcomes for the SR 37 corridor among stakeholders and the public at large. From these key themes the PEL Study Team developed a comprehensive vision for the SR 37 PEL Study.

PEL STUDY VISION

To create a vision for the SR 37 corridor that addresses existing and future transportation needs by planning for infrastructure resilience against climate change and sea level rise while improving route movement, reliability, adaptability, and functionality for corridor commuters, residents, and essential service industries in the area.

3.2 SR 37 PEL STUDY GOALS

After establishing the SR 37 PEL Study vision, the PEL Study Team collaborated with stakeholders to establish SR 37 PEL Study goals. Goals are similar to, but distinct from a project purpose. While a project purpose is intended to be concrete and measurable, project goals contribute to a project purpose but are harder to measure or have more intangible outcomes. By establishing and considering goals for the SR 37 PEL Study, the PEL Study Team had greater flexibility to incorporate concepts that were identified during the outreach process, such as restoration objectives, beyond what the PEL Study Team could achieve solely through a project purpose statement. As viable alternatives that all met the project purpose and need were developed, goals played an important role in establishing evaluation criteria that assisted with differentiating among alternatives.

Based on its engagement with stakeholders, the PEL Study Team developed the following study goals.

- Evaluate long-term integrated solutions that address the SR 37 highway's vulnerabilities and facilitate the restoration of the surrounding baylands.
- Improve route reliability, mobility, and connectivity across all modes and maintain public access.
- Implement nature-based solutions to enhance resilience while simultaneously facilitating natural ecosystem function where practicable.
- Achieve ancillary ecosystem benefits with the northern baylands through partnerships and collaborative planning for future conditions.

3.3 SR 37 PEL STUDY NEED

Federal law establishes a requirement for stating a project purpose and need through USC and CFR. The purpose and need statement should include a clear statement of the objectives that the program or project is intended to achieve (23 USC 139(f)(3)). For transportation projects, this can include achieving a transportation objective identified in an applicable statewide or metropolitan transportation plan (23 USC 139(f)(3)). The FHWA states that the purpose and need statement should identify the transportation problem, not the solution (23 CFR Part 450, Appendix A).

- Resiliency
- Functionality
- Reliability
- Multimodal
- Access
- Equity

Federal regulations at 23 CFR Part 450, Appendix A describe the way in which the transportation planning process can be used to develop the project purpose and need. Specifically, a sound transportation process involves state and local governments, stakeholders, and the general public to "establish a vision for the region's future transportation system, define transportation goals and objectives for realizing that vision, decide which needs to address, and determine the timeframe for addressing these issues." Once the region's future transportation system has been envisioned, the

transportation planning process can provide the background and a framework for describing the scope of a proposed transportation program or project. This process involves further outreach and engagement to collect more information, refine the scope of the program or project, and eventually develop project alternatives, alternatives screening criteria, and environmental review.

Once the vision and goals for the SR 37 PEL Study were established, the PEL Study Team held meetings with stakeholders and the general public between 2020 and 2021 to better identify the needs for the SR 37 PEL Study. The resulting needs were based on key themes that emerged in development of the vision statement.

These themes fit into the characteristics for identifying program or project need (FHWA Technical Advisory T 6640.8A). The following sections reflect the input received from stakeholders and project partners and explore the considerations that led from the vision and goals to the final purpose statement for the SR 37 PEL Study in the context of FHWA guidelines.

3.3.1 Resiliency and Extreme Events

The SR 37 corridor currently experiences flooding during winter rain and high tide events with closures happening with increasing frequency. Rising sea levels due to climate change will critically affect both the study corridor and surrounding sensitive ecosystems. The most immediate impact of sea level rise will be flooding of lands that did not previously experience tidal or storm-based inundation. Changes in wave height and run-up, as well as wave action on newly eroded lands, will affect shoreline areas as sea levels rise. Sea level rise will increase salinity and erosive pressure on tidal, brackish, and freshwater marshes that border SR 37 and surrounding lands.

2017 Levee Breach South of SR 37

Currently, SR 37 relies on a complex interconnected system of levees along Novato Creek, the Petaluma River, Tolay Creek, Sonoma Creek, the Napa River, and the San Francisco Bay for flood protection. Many of the levees are privately owned and were not constructed specifically to protect SR 37 from flooding. Instead, protection of SR 37 is an ancillary benefit of the levees. Despite the levees, however, flooding occurs along some portions of SR 37 such as Novato Creek, Tolay Creek, and Mare Island and is expected to worsen with rising sea levels. Existing levees protect the low-lying western portion of SR 37 from daily tidal inundation and storm surge flooding. In the middle portion

Levees Restored in 2017

of the corridor, SR 37 functions as a levee, and will increasingly face threats from scour, saturation, erosion, inundation, or failure as sea levels rise and flood frequency increases. Flooding is expected to worsen with rising sea levels, imperiling the future viability of the existing SR 37 roadway.

3.3.2 Route Movement and Functionality

SR 37 is a critical route within the Bay Area's regional transportation network and is important to the movement of both people and goods. SR 37 provides the most direct east and west connections within the region, providing the shortest land route between Novato and Vallejo. SR 37 roughly parallels the route of the Richmond-San Rafael Bridge on I-580 and thus functions as a recovery route in case of an emergency or closure of the bridge. SR 37 is also part of the Interregional Roads System between US 101 and I-80 and serves as a wildfire evacuation route for northern Marin, Sonoma, and Napa Counties. Loss of SR 37 functionality and periodic closures result in network fragmentation and adversely affect the more than 30,000 daily users who rely on this route.

3.3.3 Travel Time Reliability

SR 37 currently serves large numbers of single-occupancy vehicles. Portions of SR 37 are highly congested during weekday commute periods but also on the weekends, when recreational travelers visit the wine country in the Napa and Sonoma Valleys. The corridor experiences congestion for roughly 13 hours a day and currently has no transit options. The primary cause of corridor congestion is vehicular demand exceeding the capacity of the SR 37 corridor, specifically between SR 121 and Mare Island.

In its current configuration, travel through the corridor takes approximately 20 minutes under free-flow conditions, while travel times of 120 minutes or more are periodically recorded during congested conditions. Roadway crashes and similar incidents, weather, and special events are factors in approximately half of the instances where travelers experienced these delays. Near-, mid-, and long-term interim measures have been proposed along the corridor to improve this condition, several of which are assumed in the baseline conditions of this SR 37 PEL Study.

However, numerous mobility issues affecting highway capacity, roadway design standards, and structural conditions along the route will remain, including various lane configurations within the Study Area, bottlenecks, short merge distances, high frequency of intersections, and settlement of this coastal roadway.

3.3.4 Lack of Multimodal Options

The lack of multimodal options contributes to and perpetuates traffic congestion. No transit or rail services currently exist in the corridor. The failure to accommodate users' needs, highway design, and unreliable travel times substantially affect the ability of people to move across and along the corridor.

Many areas along the SR 37 corridor have insufficient shoulders to accommodate bicycles. Because of this deficiency, coupled with high vehicle speeds, SR 37 is not conducive to bicycle usage. Pedestrian facilities are minimal.

3.3.5 Maintaining Access to Properties

Numerous public lands, individual private driveways, and business properties have access points along the SR 37 corridor that must be considered and evaluated during this PEL process. The current number, locations, and design of these public access points have contributed to traffic operational deficiencies along the corridor. Inconsistent access spacing negatively affects reliable and efficient mobility along the corridor. In addition, there is strong desire for improved public access to the recreational opportunities in and around San Pablo Bay. Additionally, climate change and sea level rise pose significant threats to many low-lying properties adjacent to the existing SR 37.

Example of Access Points

3.3.6 Need to Address Existing Inequities in the Transportation Network

A large percentage of trips along the corridor consists of commute trips, with a majority of those using the corridor making below the Bay Area median income. The inadequate capacity, travel time unreliability, and lack of multimodal options of the SR 37 corridor therefore has a disproportionate effect on people below the median income. The consequences of the low capacity, unreliable travel time, and lack of multimodal transportation infrastructure, in particular transit but also bicycle and pedestrian, exacerbate the inequity of SR 37's role in regional transportation.

3.3.7 Final SR 37 PEL Study Needs

The need for the SR 37 PEL Study, therefore, encompasses several problems that need solutions. The PEL Study Team consolidated the input received and refined it into the following SR 37 PEL Study Needs.

SR 37 PEL STUDY NEEDS

- Resilience to precipitation and high tide events along SR 37 is compromised and, with climate change, the corridor will become increasingly less resilient. An improved SR 37 corridor is needed to provide the transportation infrastructure with resilience to climate change and extreme events.
- The function of the SR 37 corridor as a connecting link is currently compromised when extreme weather and tide events cause intermittent closure.
- Further, the congestion and lack of travel time reliability along SR 37 compromise the ability of SR 37 to function as a connecting link.
- The corridor offers no multimodal options, such as transit or bicycle and pedestrian access, which could lessen congestion and travel time.
- SR 37 provides a work-home commute corridor for workers in Solano County, who earn below median income for the Bay Area. The corridor's transportation shortcomings are borne disproportionately by the worker population of Solano County.
- SR 37 currently provides access to multiple public and private points. However, the number, locations, and design of these public access points have contributed to traffic operational deficiencies in the corridor. The need for access is expected to worsen in the future when more vehicles are using the corridor.

3.4 SR 37 PEL STUDY PURPOSE STATEMENT

The purpose statement evolved throughout the SR 37 PEL Study process. In early 2021, the PEL Study Team presented the following draft SR 37 PEL Study Purpose Statement to the RAP and SWG focus groups.

- Enhancing resilience against extreme events (earthquakes, fire, flooding) through year 2100
- Improving travel time reliability
- Preserving SR 37 as a critical route
- Accommodating multimodal uses
- Maintaining and improving access

The PEL Study Team presented the draft SR 37 PEL Study Purpose Statement at a May 2021 public meeting and held follow-up discussions with the SWG on July 30, 2021, and the RAP on August 27, 2021. These meetings generated hundreds of comments on the draft purpose statement.

Commenters stressed that the purpose statement should not be limited to interests of the lead agency but should also articulate all areas of concern identified by various stakeholders. Stakeholders identified a range of items they believe should be incorporated into the purpose statement, from specific terminology to transportation solutions for the corridor, such as rail and bus.

The PEL Study Team carefully considered the input received and updated the SR 37 PEL Study Purpose Statement five times. The final version of the SR 37 PEL Study Purpose Statement below reflects the current focus for the SR 37 PEL Study on the transportation function of SR 37.

SR 37 PEL STUDY PURPOSE

- Preserving a critical regional transportation corridor that is resilient to extreme events while integrating ecological resiliency, which facilitates adaptation to sea level rise.
- Providing reliable travel time and promoting increases in average vehicle occupancy.
- Providing safe mobility for bicyclists and pedestrians.
- Maintaining and enhancing public access, including to recreational areas.
- Providing equitable multimodal transportation solutions that improve access for, and providing meaningful benefits to, all users of SR 37, with special consideration of underserved communities.

CHAPTER 4

Existing Conditions

This chapter describes the existing conditions of 21 resources in the Study Area at a landscape level. The information provided for each resource category was used in the alternatives screening process and will also inform the future environmental review process.

4.1 INTRODUCTION

As shown in Figure 1-1, the generalized Study Area includes land in Marin, Sonoma, Napa, and Solano Counties and is generally bounded by US 101 between Petaluma and Novato to the west, SR 116 and SR 12 to the north, SR 29 between SR 12 and Vallejo to the east, and San Pablo Bay to the south. The following sections describe the Study Area for each resource, if it is different from the generalized Study Area, summarize the methods used to compile resource information, and describe the existing conditions for that resource. Appendix C, *State Route 37 Corridor Planning and Environmental Linkages Study Existing Conditions Reports*, includes the detailed chapters for each resource. In general, the Study Area for each resource is based on the ten alignments identified in Chapter 5, *Alternatives Identification.*[2]

[2] The existing conditions prepared for this SR 37 PEL Study were prepared during identification of the ten alignments identified in Chapter 5 but before a subset of those alignments were developed into alternatives. See Section 5.1 for further information on alignments and alternatives.

4.1.1 Agricultural Lands

The SR 37 PEL Study team identified agricultural lands based on review of GIS data representing the project alignments and agricultural resources. The GIS data reviewed included California Department of Conservation (DOC) and Natural Resources Conservation Service (NRCS) data for Prime Farmland, Unique Farmland, Not Prime Farmland, and Farmland of Statewide Importance. Additional data reviewed included Farmland of Local Importance, Grazing Land, and land under Williamson Act contract, as well as lands under conservation easement or agricultural preserve protection, and land zoned for agricultural use by local jurisdictions. Land zoned for agricultural use by local jurisdictions exists throughout the Study Area outside of incorporated cities and towns.

Agricultural products produced in the Study Area include livestock; livestock products, including milk, cheese, eggs, and wool; field crops, including hay, rye, oat, straw, and pasture; and fruit, vegetable, and nursery crops, including wine grapes and wine, olives, apples, citrus, floral crops, and nuts.

Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are in the northern and northeastern portions of the Study Area in Sonoma and Napa Counties, as designated by DOC and NRCS (Figures 4-1 and 4-2, respectively). Some Prime Farmland and Unique Farmland is located in the northwestern portion of Solano County. Farmland of Local Importance is concentrated in the southern portion in Marin and Sonoma Counties. Grazing Land (Figure 4-1) generally occupies the western portion of the Study Area in Marin and Sonoma Counties, northern Napa County, and eastern Solano County.

Lands protected by Williamson Act contracts are located throughout the northwestern and north-central portions of the Study Area, with concentrations in central and northern Sonoma County and western and northern Napa County (Figure 4-3). These Williamson Act contracted lands, depending on size of the parcel and other conditions, are eligible to be designated as agricultural preserves. No Marin Agricultural Land Trust agricultural conservation easements are in the Study Area (Figure 4-4). Lands under agricultural conservation easement managed by the Sonoma Agricultural Preservation and Open Space District lie north of SR 37 between the Petaluma River and Lakeville Highway and on the eastern border with Napa County.

Future projects should further evaluate the proximity of agricultural lands along the preferred alignment and coordinate with the appropriate governing agencies/bodies regarding agricultural lands.

Figure 4-1. California Department of Conservation Important Farmlands

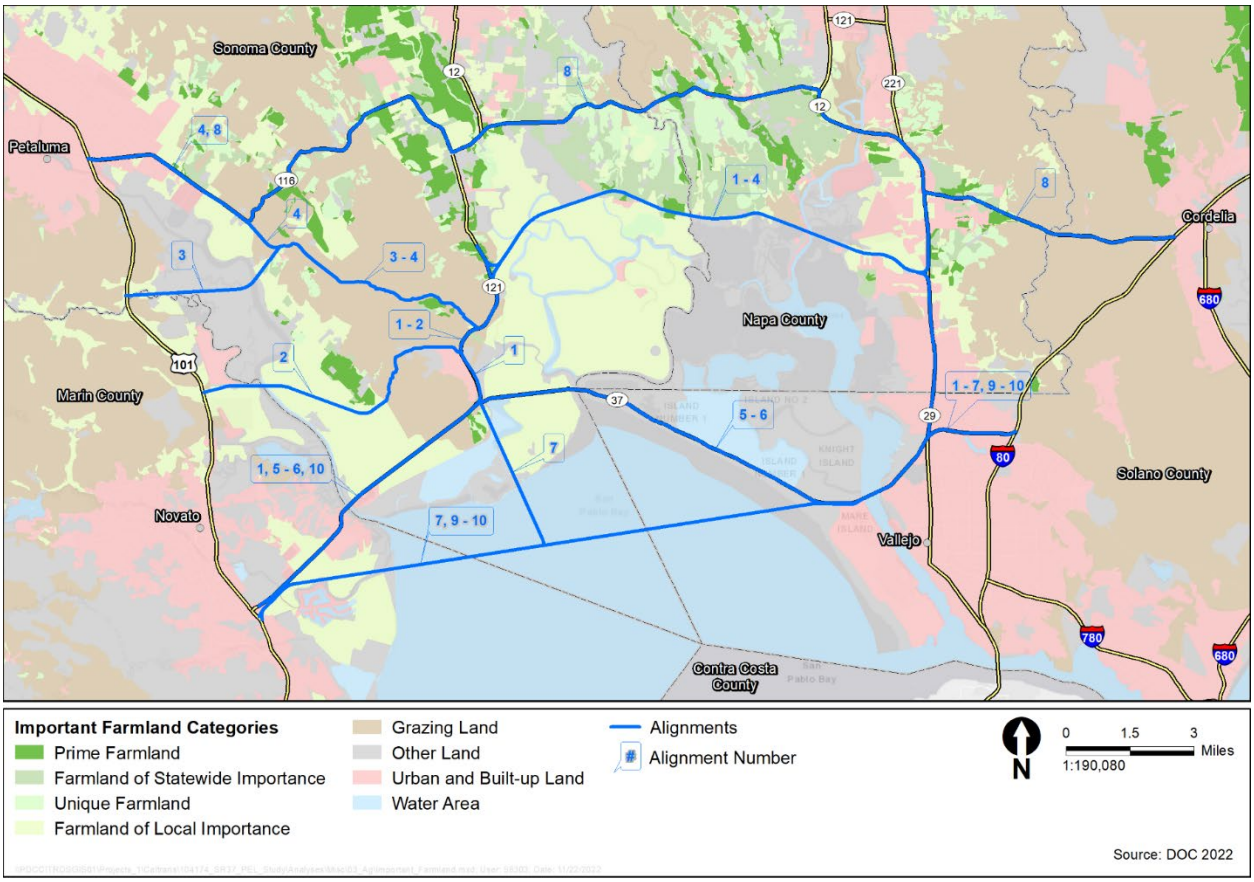


Figure 4-2. Natural Resources Conservation Service Important Farmlands

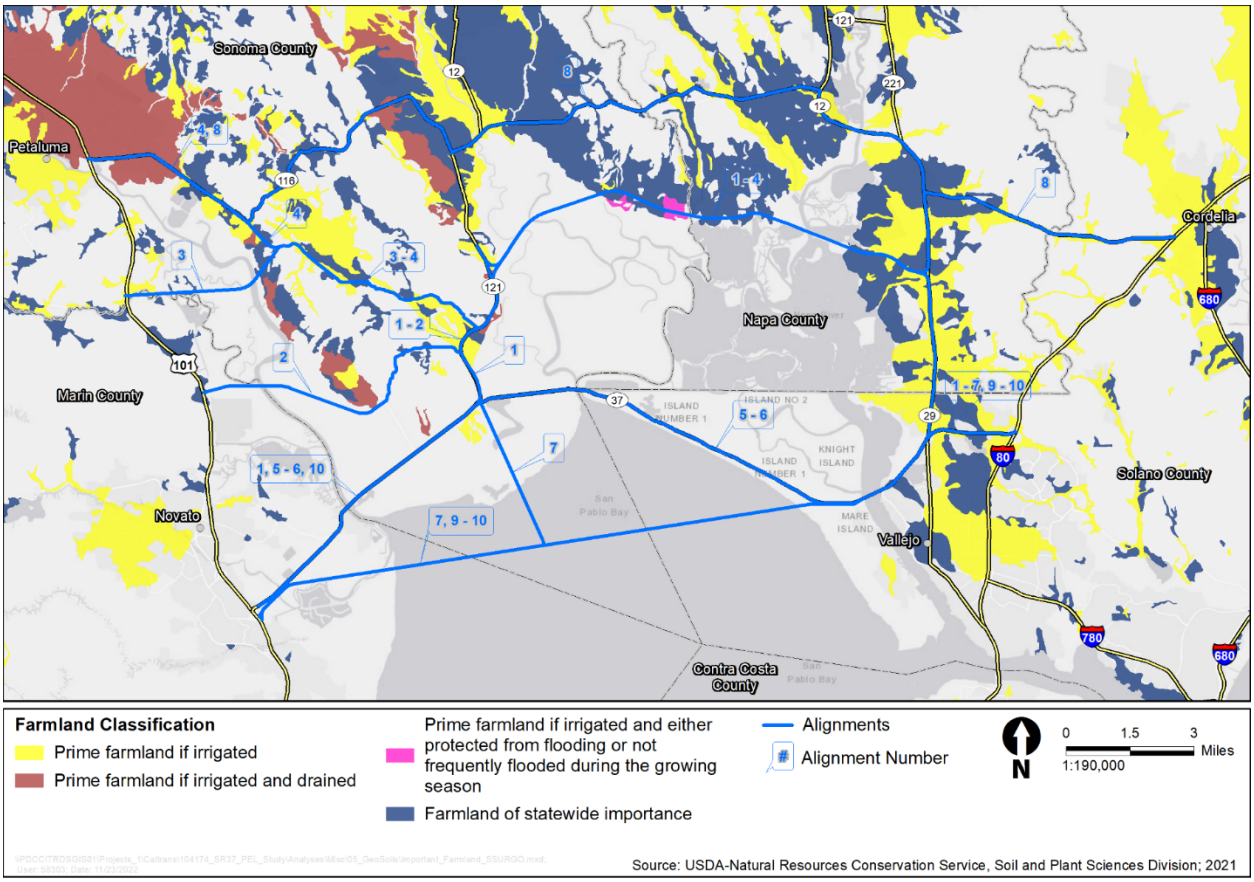


Figure 4-3. Williamson Act Contract Lands

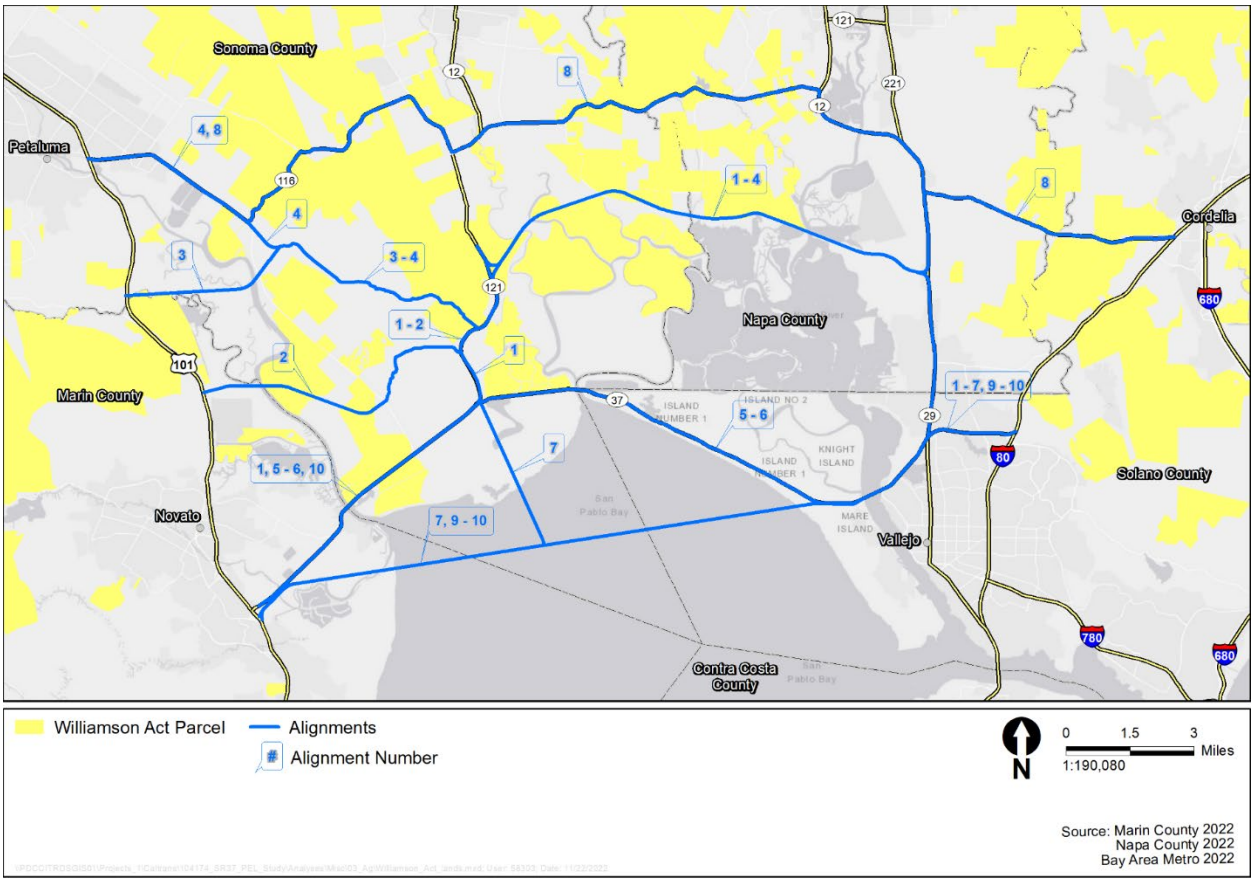
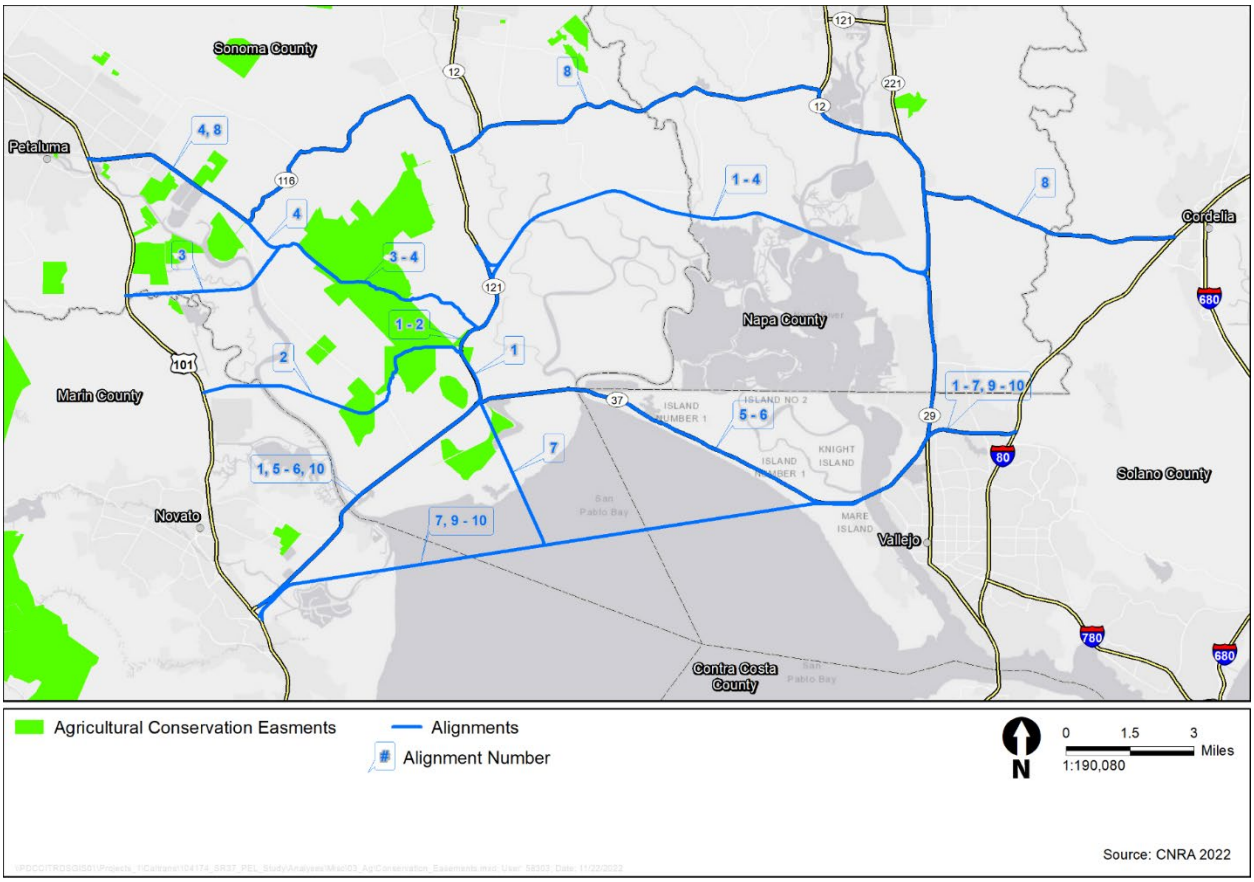


Figure 4-4. Marin Agricultural Land Trust Agricultural Conservation Easements



4.1.2 Air Quality and Greenhouse Gas Emissions

Existing conditions for air quality and GHG emissions were assessed by reviewing regional air quality planning documents, monitoring data, and attainment status information.

Air Quality

The regional air quality Study Area (Figure 4-5) includes the San Francisco Bay Area Air Basin (SFBAAB), which covers Alameda, Contra Costa, Marin, Napa, Santa Clara, San Mateo, and San Francisco Counties, and portions of Sonoma and Solano Counties. Climatological subregions in the Study Area include Marin County Basins, Cotati and Petaluma Valleys, Sonoma Valley, Napa Valley, and the Carquinez Strait Region.

Primary factors that influence the existing air quality within each climatological subregion include meteorological conditions such as distance from the ocean, temperature, wind patterns and speed, and topography, as well as proximity to potential pollution from industrial activities or vehicle emissions near major roadway corridors. Chapter 3 of Appendix C provides detailed descriptions of the climatological subregions.

The existing air quality conditions in the Study Area are further characterized by the attainment status of the region and monitoring data collected in the region. Criteria pollutant levels from air quality monitoring stations was available for 2018–2020 from three monitoring stations near the Study Area including one each in Marin, Napa, and Solano Counties as shown on Figure 4-6.

With respect to national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), the status of the Study Area is nonattainment for three criteria pollutants.

- 8-hour ozone (NAAQS and CAAQS)
- Particulate matter less than 10 microns in diameter (CAAQS)
- Particulate matter less than 2.5 microns in diameter (NAAQS and CAAQS)

The status is attainment for NAAQS and CAAQS for carbon monoxide, nitrogen dioxide (NO_2), sulfur dioxide, lead, and for CAAQS sulfates (there is no federal standard for this pollutant).

Figure 4-5. Regional Air Quality Study Area

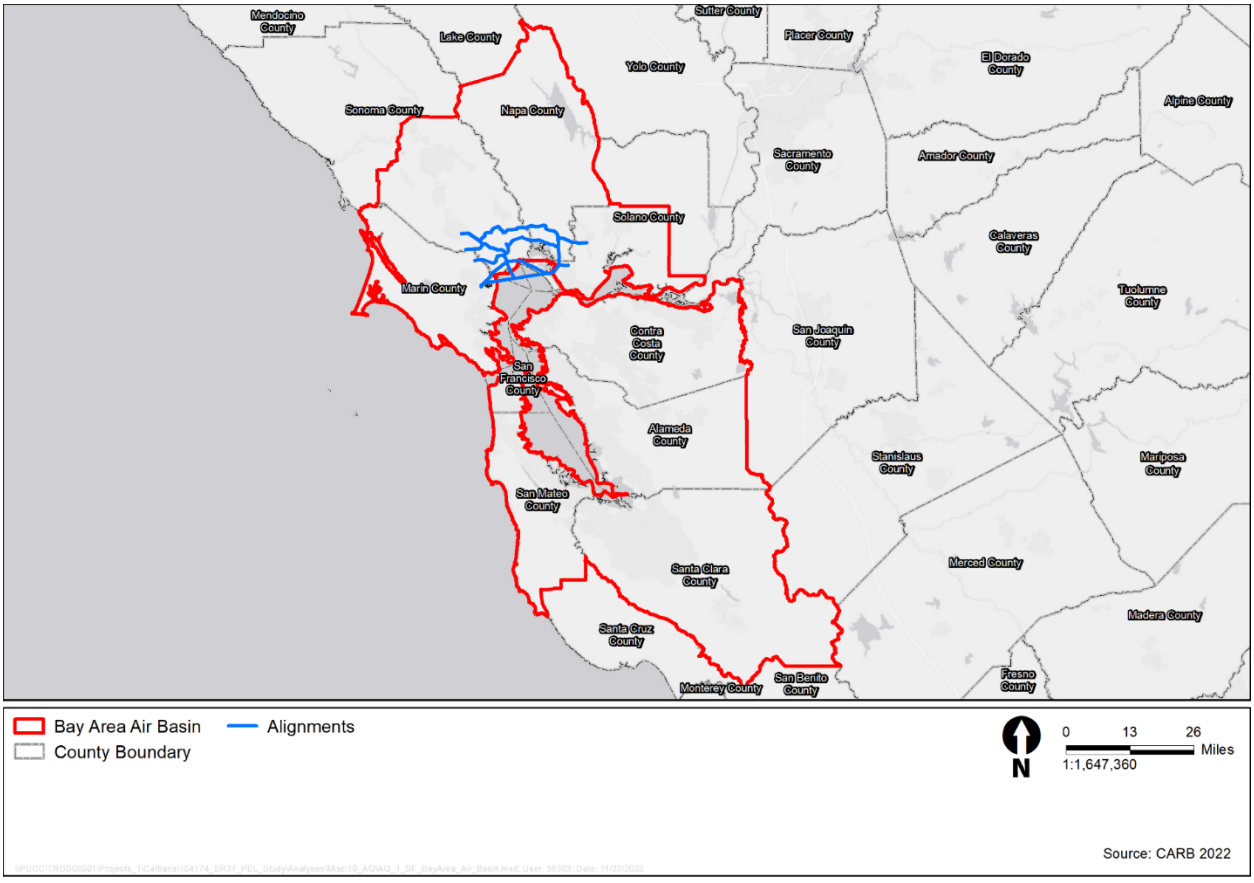
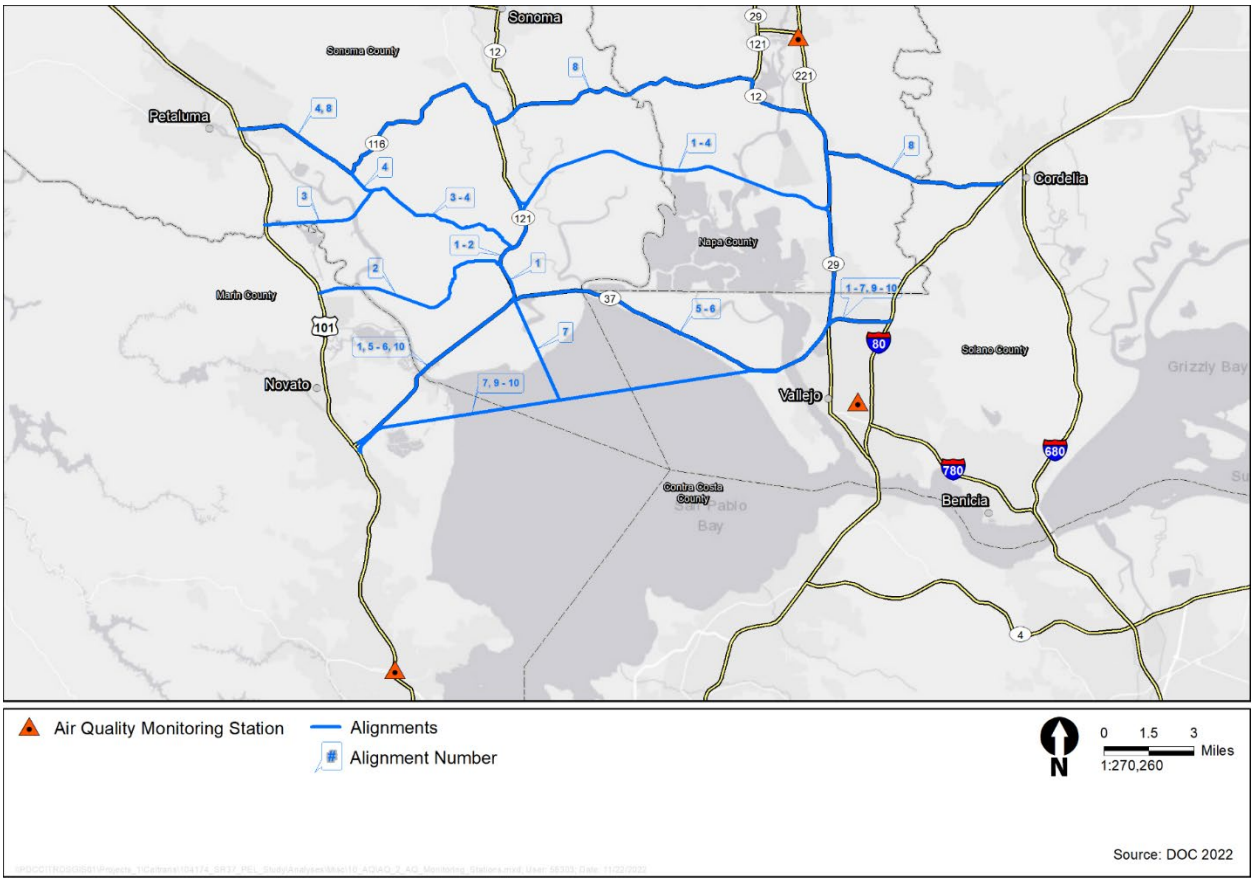


Figure 4-6. Attainment Status in the Study Area



Future projects will further evaluate the full scope of air quality impacts, including consistency with regional air quality plans and whether the preferred alignment would contribute to worsened regional air quality impacts in the SFBAAB, and the project's potential to expose sensitive receptors to toxic air contaminants and health risks.

Greenhouse Gases

The principle anthropogenic (human-made) GHGs are carbon dioxide (CO_2), methane (CH_4), NO_2, and fluorinated compounds including sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. The primary GHGs that would be emitted by construction and operation of the proposed alignments are CO_2, CH_4, and NO_2.

Climate change is a complex process that has the potential to alter local climatic patterns and meteorology. Modeling indicates that climate change will result in sea level rise, both globally and in the San Francisco Bay, as well as changes in climate and rainfall, among other effects. However, there remains uncertainty about precise local climate characteristics and precisely how various ecological and social systems will react to changes in the existing climate at the local level. Regardless of this uncertainty, it is widely understood that substantial climate change

has occurred and will continue to occur in the future, although the precise extent will take further research to define.

The impacts of climate change, such as increases in the number of heat-related events, droughts, and wildfires, pose direct and indirect risks to public health, with people experiencing worsening episodes of illness and an earlier death. Indirect impacts on public health include increases in incidents of vector-borne diseases, stress and mental trauma due to extreme events and disasters, economic disruptions, and residential displacement.

The impacts of climate change, such as increases in the number of heat-related events, droughts, and wildfires, pose direct and indirect risks to public health.

Future projects will further evaluate the full scope of GHG emissions impacts, including how the projects support or hinder California's GHG goals and climate change planning documents.

4.1.3 Community Demographics and Land Use

To assess the conditions related to community demographics and land use in the Study Area, local and regional planning documents and publicly available information pertinent to community demographics and land uses (such as the U.S. Census Bureau) were reviewed. Figures 4-7, 4-8, and 4-9 depict zoning in the counties and unincorporated areas included in the Study Area.

SR 37 connects suburban and urban centers, while crossing marshes, canals, sloughs, wetlands, and agriculture. Development in the four North Bay counties is a combination of suburbs, smaller cities and towns, and agricultural and industrial areas. According to DOC Farmland Mapping and Monitoring Program, Napa County has the lowest percentage of urban built-up land among the nine Bay Area counties, at 5%. Within the Study Area, Petaluma, American Canyon, and Vallejo are the most densely developed areas with population densities higher than their respective counties and ranging from 3,780 to 4,028 persons per square mile in 2010.

Figure 4-7. Marin County and City of Novato Zoning

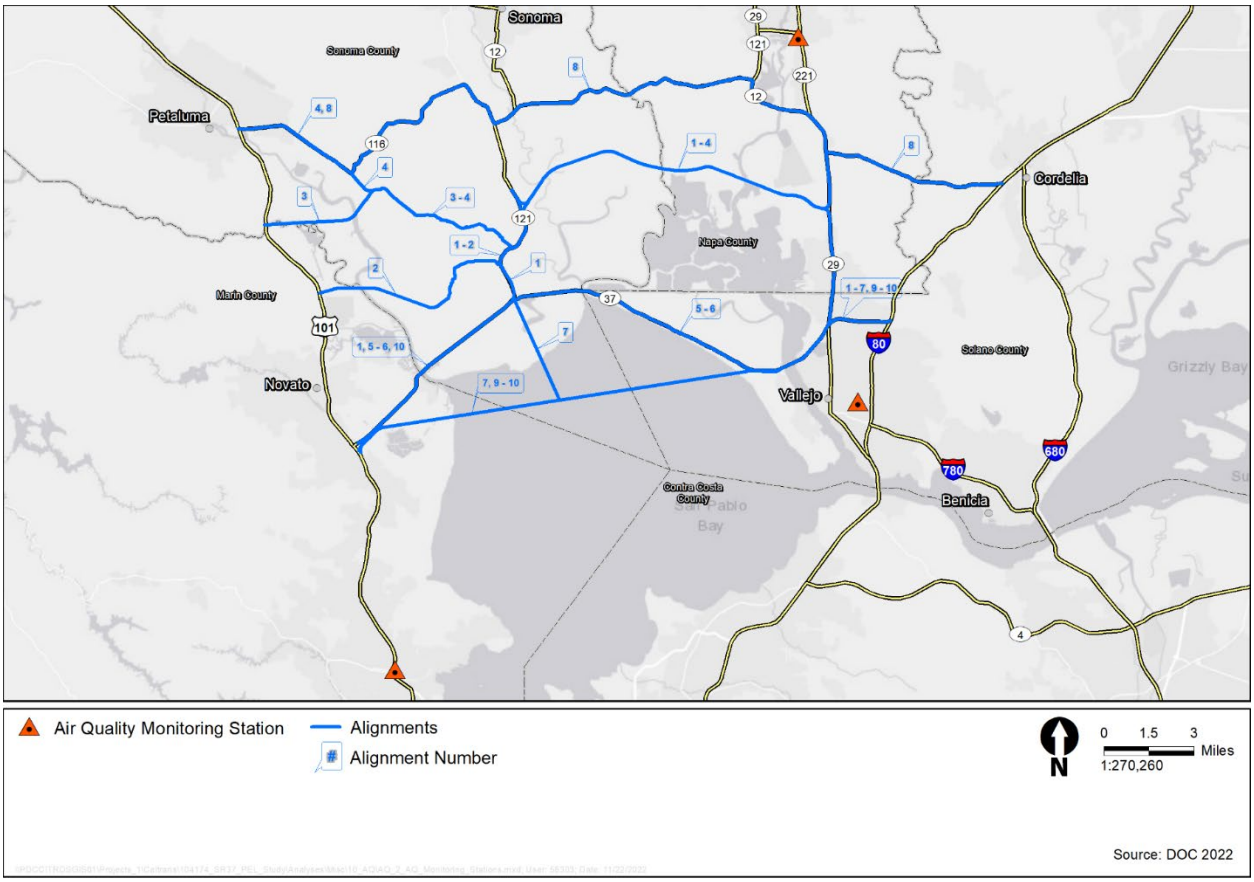


Figure 4-8. Napa County and Sonoma County Zoning

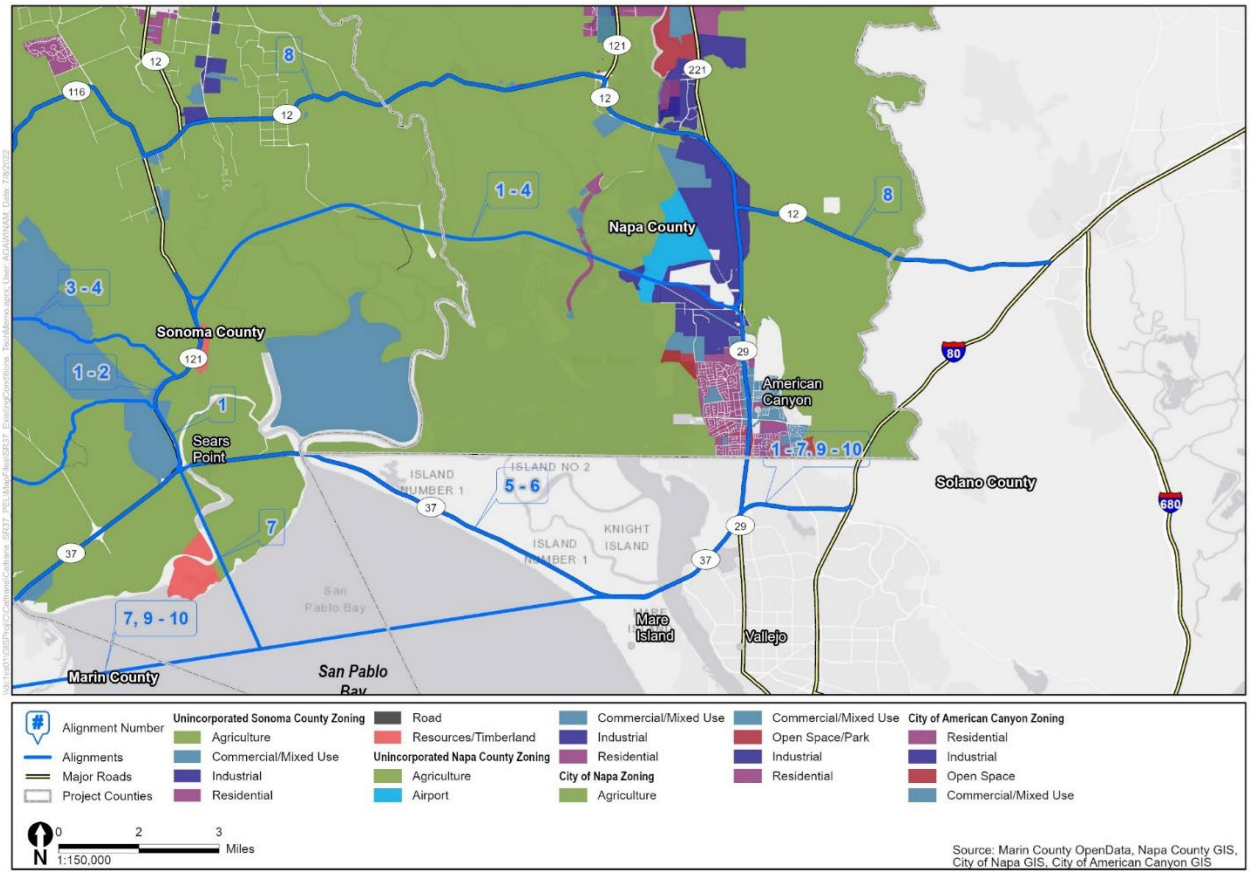
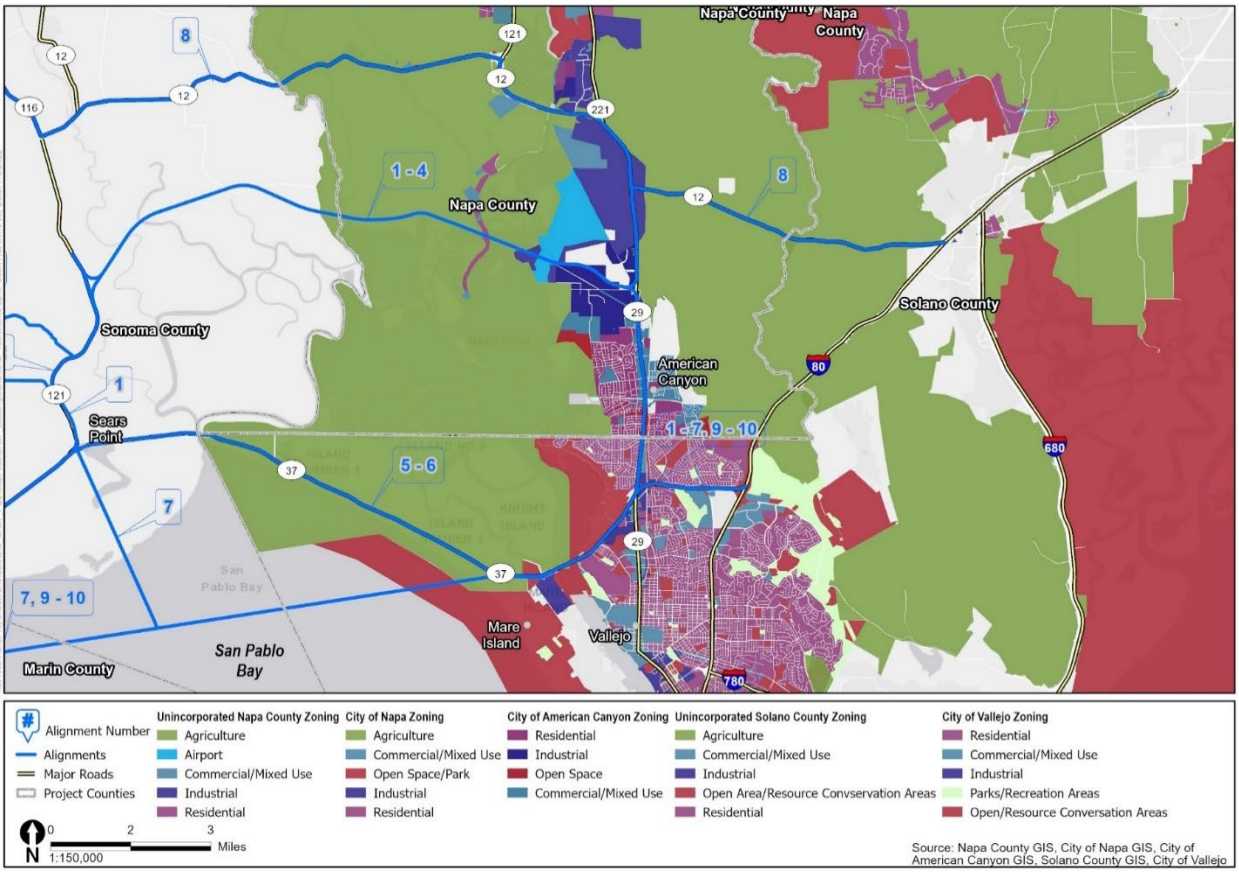


Figure 4-9. Napa County and Solano County Zoning

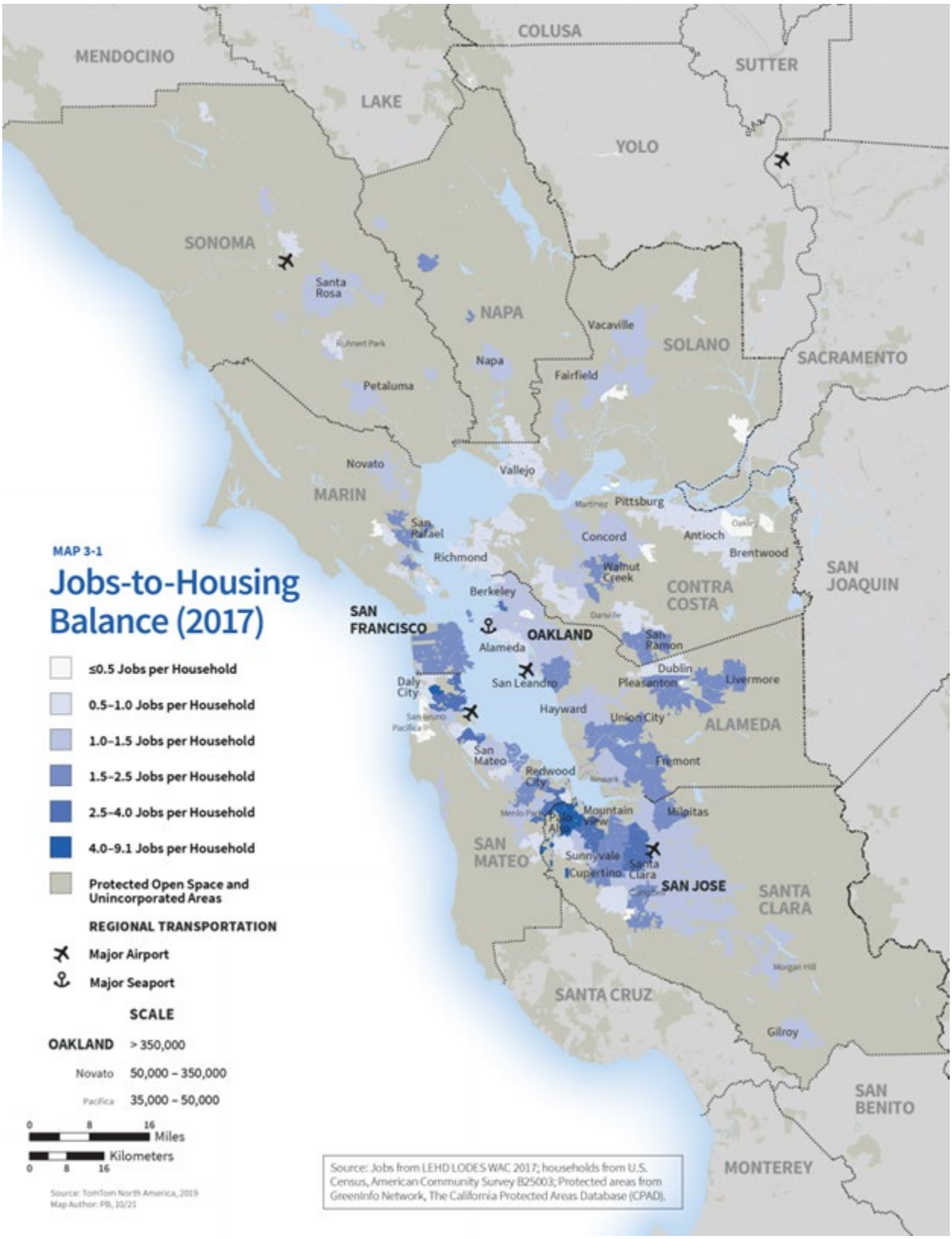


Marin County is one of the least diverse counties in the Bay Area, while Solano County is the most diverse. Marin County has a large aging population with the highest median age in the North Bay, at 47.1 years, while Solano County has the youngest population with a median age of 38.5 years. Marin County has the highest proportion of people with a bachelor's degree or higher in the North Bay, at 60.2%, while Solano County has the lowest proportion of people with a bachelor's degree or higher at 21.7%. In 2020, Sonoma County had a population of 488,863—the largest in the North Bay, and the highest number of households in the North Bay at 188,958 households (2016–2020). Napa County, on the other hand, had the smallest population and population density in the North Bay, with a population of 138,019 and 485.1 persons per square mile in 2010.

In the North Bay, jobs are generally most concentrated in Sonoma and Marin Counties, while housing is concentrated in Solano County. Much of the workforce for Sonoma and Marin County jobs resides in more housing-rich areas such as Vallejo in Solano County and portions of the East Bay (Figure 4-10). This imbalance of jobs and housing creates several associated problems, such as traffic congestion and transit overcrowding in major commute corridors such as SR 37. It also exacerbates the displacement of longtime residents from neighborhoods where home values and rents have increased.

In the North Bay, jobs are generally most concentrated in Sonoma and Marin Counties, while housing is concentrated in Solano County.

Figure 4-10. Jobs-to-Housing Balance in the Study Area



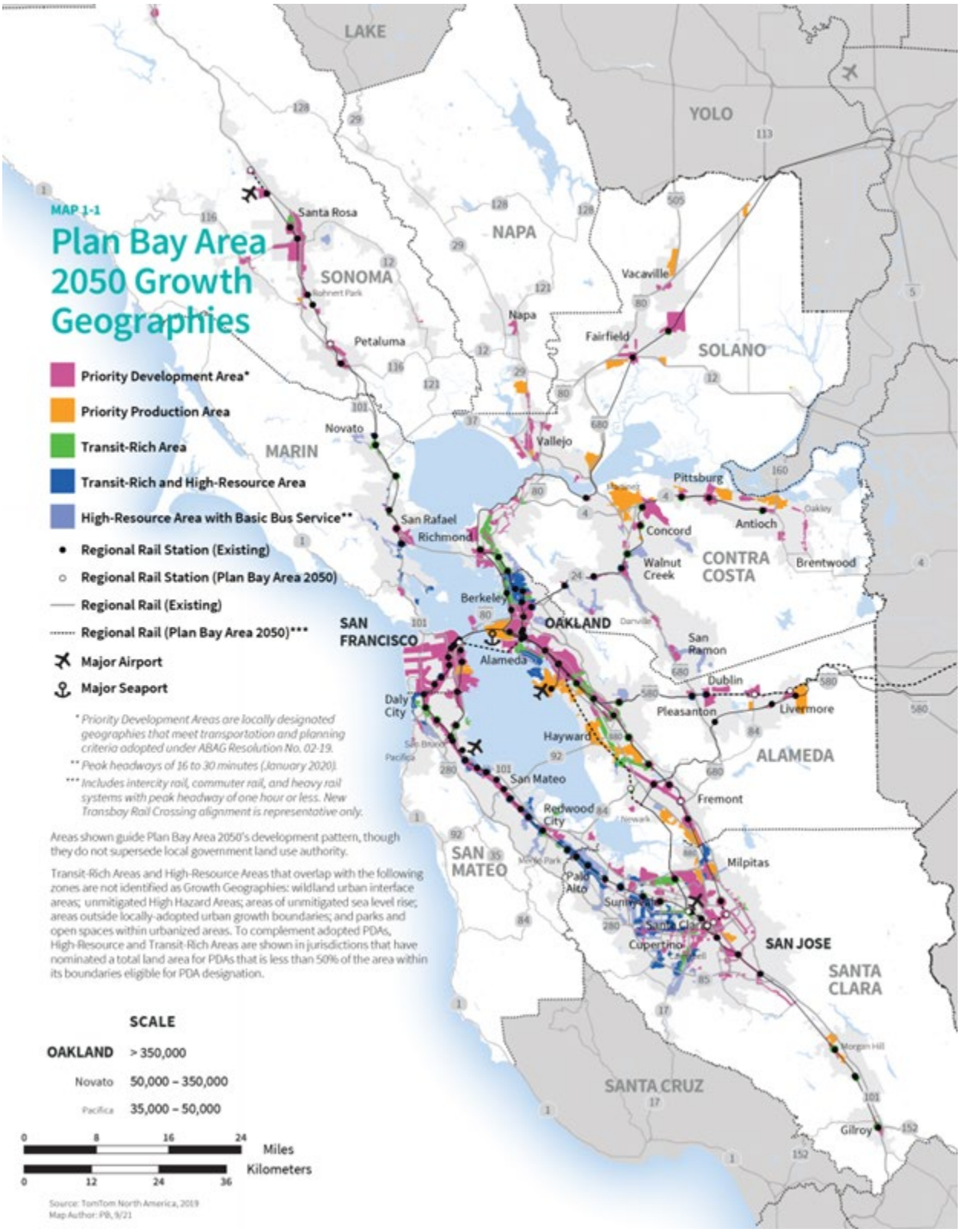
These issues have been recognized at the regional level and several efforts are underway to address them. MTC identifies Equity Priority Communities (EPC) in every Plan Bay Area update. EPCs are census tracts that have a significant concentration of underserved populations, such as households with low incomes and people of color. Identifying EPCs helps MTC make better decisions on investments that meaningfully reverse the disparities in access to transportation, housing, and other community services. These are further discussed in Section 4.1.20, *Equity*. Additionally, Plan Bay Area 2050[3] identifies growth geographies in the Bay Area, several of which are in the Study Area. Growth geographies are areas identified for growth either by local jurisdictions or due to their proximity to transit or opportunities like well-resourced schools or easy access to jobs. The plan identifies four types of growth geographies: (1) Priority Development Areas (PDAs), (2) Priority Production Areas (PPAs), (3) Transit-Rich Areas (TRAs), and (4) High Resource Areas (HRAs).[4] The majority of PPAs are concentrated in the North Bay and East Bay, where housing is plentiful, but job opportunities are more limited. Vallejo and American Canyon are home to both PDAs and PPAs, while Petaluma has PDAs only and Novato has TRAs and HRAs (Figure 4-11).

Even though growth is anticipated and planned for in the North Bay, the four North Bay counties are expected to be home to less than 10% of new households and jobs in the Bay Area in 2050, as relatively limited job centers and transit options coupled with wildfire risk make these counties less suited for growth. In fact, Marin County is projected to see a minor net loss in jobs as its population continues to age and exit the workforce.

Future projects will further consider their impact on growth within PDAs or conflict with PPAs. Population and job growth along the I-80 corridor in Solano, as well as proposed development on Mare Island (in Vallejo), may affect SR 37.

[3] Adopted by the MTC and the Association of Bay Area Governments in October 2021.
[4] PDAs are areas generally near existing job centers or frequent transit that are locally identified (i.e., identified by towns, cities, or counties) for housing and job growth. PPAs are industrial areas that have been locally identified for job growth in middle-wage industries like manufacturing, logistics, or other trades. TRAs are areas near rail, ferry, or frequent bus service that were not already identified as PDAs, and HRAs are state-identified places with well-resourced schools and access to jobs and open space that may have historically rejected housing growth.

Figure 4-11. Growth Geographies in the Bay Area



4.1.4 Conversion of Land

The analysis of conditions related to the conversion of land in the Study Area referred to information about existing land use and zoning from county and municipal land use planning documents and GIS. These include the jurisdictions of Marin, Sonoma, Napa, and Solano Counties, as well as the cities of Novato, Petaluma, Napa, American Canyon, and Vallejo.

The Study Area is in the Novato planning area of the *Marin Countywide Plan*, which guides land use in unincorporated portions of Marin County. The Study Area crosses lands primarily zoned for agriculture and open areas for environmental preservation. The Study Area also spans lands zoned for resort and commercial recreation purposes, which are intended for resort facilities that provide access to public recreational areas and adjacent developed areas.

Sonoma County's General Plan directs the patterns of land use throughout unincorporated Sonoma County. The Study Area here mainly requires new ROW across land zoned for recreation and visitor-serving commercial purposes. Parts of the Study Area would span land zoned for public facilities.

The *Napa County General Plan* serves as a framework for land use planning and development within unincorporated Napa County. The Study Area would mainly require new ROW on land zoned for agricultural watershed purposes where new development is restricted because development could adversely affect existing agriculture and watershed preservation. Parts of the Study Area would also cross land zoned for low-density residential development.

Additionally, the Study Area would require new ROW on land zoned for industrial purposes near the Napa County Airport. It would span land zoned for commercial limited purposes, which is intended to establish areas for tourist services and also require new ROW on land zoned for planned developments.

The *Solano County General Plan* guides current and future land development and establishes conservation policies in unincorporated Solano County. The Study Area would require new ROW on land currently zoned for agricultural purposes before it ties into existing ROW on SR 37.

As future projects are programmed from the SR 37 PEL Study, potential land use impacts will be evaluated as applicable in a NEPA and CEQA analysis. The NEPA/CEQA analysis will evaluate new ROW needs, property acquisitions or displacements, conformance with applicable land use planning documents, and impacts on the surrounding existing land use and development in the vicinity of the project. The NEPA/CEQA evaluation process will provide a more detailed determination regarding potential impacts on existing land use and identify any appropriate mitigation measures.

4.1.5 Cultural Resources

The Caltrans Office of Cultural Resource Studies Professionally Qualified Staff reviewed the Caltrans Cultural Resource Database, records from the Northwest Information Center of the

California Historical Resources Information System, and geoarchaeological sensitivity mapping for surface, buried, and submerged cultural resources.

Unrecorded built environment resources on the western end of the Study Area and Mare Island Naval Historic District on the east, which is listed on the National Register of Historic Places, have been identified. Cultural resources, including a known archaeological site, have been identified near SR 121. There is moderate sensitivity for unrecorded archaeological resources between US 101 and SR 121.

Potential historic resources of railroad, known archaeological sites, and levees and sloughs are located along Alignments 2 and 4. Additionally, these alignments pass through a recorded archaeological district that would require extensive tribal consultation.

Future projects will consider the potential to encounter a wide range of cultural resources including built environment resources such as historic districts, railroads, levees, and other features, and historic and prehistoric archaeological sites in the Study Area. All alignments have the potential to adversely affect cultural resources and will require extensive consultation with stakeholders, including Native American Tribes.

Future projects will also evaluate if the built environment resources and historic and prehistoric archaeological sites in the Study Area are eligible for protection under Section 4(f) and if protected and affected, what Section 4(f) analysis may be needed based on the potential impacts and approval required.

4.1.6 Extreme Events

The analysis of the conditions related to extreme events was drafted based on review of datasets from Cal-Adapt, the Fourth California Climate Assessment, and other publicly available information. Unlike study areas for other existing conditions, which focus on the area of impact that proposed alignments may have on the resource topic (e.g., air quality is affected throughout the basin; archaeological resources are affected by the construction footprint), the Study Area for extreme events and climate must consider the impact of such events *on* SR 37 and future projects.

> Flooding has previously resulted in SR 37 closures in February 1996, January 2005, December 2014, January–February 2017, and February 2019.

Extreme heat events can include extended heat waves, very hot days, and other high temperature conditions that have various health, infrastructure, environmental, and other effects. The region experiences four days per year with temperatures above the 98th percentile threshold (between April and October). Climate change is expected to increase the number of extreme heat days. By mid-century (2035–2064), the Study Area can expect to experience about one to three weeks per year with temperatures that are currently

considered at the 98th percentile (~94–100 degrees Fahrenheit [°F]); by late century (2070–2099), the Study Area can expect to experience about 1.5 to 5.5 weeks of such temperatures.

The Study Area has experienced multiple periods of drought over the past two decades, including 2014–2016 and 2020–2022. Drought is a relatively geographically uniform phenomenon compared to other hazards (e.g., precipitation, wildfire), with consistent patterns throughout the Study Area. Climate change is expected to increase the likelihood of drought over time.

Marin, Sonoma, Napa, and Solano Counties have been affected by large wildfires in the recent past, with the Nuns Fire in 2017 overlapping with the proposed Alignment 8 along SR 12 and the 37 Fire in October 2017 that burned near the current SR 37 at Sears Point.

Other extreme events relevant to the Study Area include seismic events and flooding. Flooding has previously occurred in the Study Area due to storms and high tides. For example, king tides and flooding on Novato Creek resulted in SR 37 closures for 20 days in February 1996, 21 days in January 2005, one day in December 2014, and for nearly a month in January–February 2017. In February 2019, heavy rains flooded the highway twice near Novato Creek. Other flood-prone sites exist along Tubbs Island and Mare Island. Climate change is expected to make flooding events more frequent and more intense due to sea level rise and changing precipitation patterns.

Future projects will consider how the extreme conditions described above could affect the infrastructure and users of SR 37 and assess alignments that integrate resilience to these conditions. For example, extreme heat will be an important consideration in the design of bicycle, pedestrian, and transit options in the corridor to ensure adequate shading and green space that will enable these modes to be viable long-term options, even in warm months. Flooding and wildfire are well-known threats to the Study Area and will increase in intensity and likelihood in the future, so alignments and design will take this into account.

4.1.7 Floodplains

This analysis describes the existing floodplains, areas that experience periodic flooding, watersheds, surface water, and groundwater in the Study Area. These existing conditions were developed based on a review of state and federal geospatial datasets and publicly available information pertinent to floodplains and water resources.

The floodplains surround San Pablo Bay and follow the Novato Creek, Petaluma River, Tolay Creek, Sonoma Creek, and connected sloughs, and Napa River inland. Much of the Study Area overlaps with the floodplain. Creek crossings along SR 37 are areas prone to flooding.

In 2050, 24 inches of sea level rise are expected to inundate areas of SR 37 along Novato Creek, between Black Point and Sears Point, and along the northeastern shoreline of San Pablo Bay. With storm surge from the 100-year storm on top of 24 inches of sea level rise, nearly all of the

existing SR 37 would be flooded. In the future, the 100-year storm (i.e., 1% annual chance storm) is expected to become more intense due to climate change.

Climate change may alter channel width in the future. Currently, the Study Area includes diked baylands that will fill and empty with the tides if the levees are breached. The historical baylands were largely eliminated over the past 150 years due to diking and filling for flood control and land reclamation, with un-engineered levees and berms along Novato Creek, the Petaluma River, and Sonoma baylands originally designed to reclaim land for agricultural use rather than to protect the road. Now, the former marshes are several feet below mean higher-high water, and the whole area depends on levees and pumping to avoid flooding. If the levees were to fail, large portions of land along the Novato Creek and Petaluma River (including the current SR 37 route) would be inundated on each tide. The levees currently protect most areas, and so there is relatively little water that flows to and from the marsh in tidal channels. However, climate change is expected to change streamflow patterns by increasing the severity of flood events, and tidal action may be restored to diked areas due to erosion and breaching of levees, or via restoration projects. If tidal action is restored, then the tidal channels will erode to accommodate the influx of water as the tidal prism increases in volume. Eroded channels could lead to erosion of levees and scouring around bridge piles.

> By 2050, 24 inches of sea level rise are expected to inundate areas of SR 37 along Novato Creek, between Black Point and Sears Point, and along the northeastern shoreline of San Pablo Bay.

Future projects will consider the risks both to and from floodplains and water resources in the Study Area. Coordination with governing agencies, including BCDC and other floodplain management agencies, may be required. California requires that local, state, and federal water resources and floodplain management agencies be consulted if a proposed action encroaches on a 100-year base floodplain.

4.1.8 Water Quality

This analysis describes the existing water quality conditions and impairments in the Study Area. Watersheds and receiving waterbodies in the Study Area are also considered to be part of the Study Area for water quality.

This analysis was drafted based on a review of State Water Resources Control Board (SWRCB) resources and publicly available information pertinent to water quality resources. Some of the resources reviewed include:

- San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)
- California 2020/2022 Integrated Report: 303(d) list of impaired waterbodies
- Sustainable Groundwater Management Act Basin Prioritization Dashboard

The analysis conducted revealed the following:

- Surface Water Hydrology: The San Pablo Bay watershed encompasses over 784,984 acres and drains into the northern reaches of San Francisco Bay. The watershed is the northern reach of the San Francisco Estuary and is a major drainage basin for Marin, Sonoma, Napa, Solano, and Contra Costa Counties. Streams draining to San Pablo Bay are tidally influenced in the lower reaches. A unique feature in the San Pablo Bay watershed is the large tracts of historical baylands, both diked and tidal. Some of these diked baylands include important seasonal wetlands.
- Surface Water Quality: The San Pablo Bay watershed has experienced increased soil erosion and stream channel degradation. Due to waterway modification, development of rural lands, and increased pollution, water quality in the watershed is declining. Northern Marin County and Napa and Sonoma Counties converted wetland uses to predominantly grazing and cultivated croplands. Urbanized areas continue to grow in each county, adversely affecting water quality.
- Groundwater Quality: Many inorganic constituents occur naturally in groundwater. Groundwater quality was investigated from August to November 2004, as part of the California Groundwater Ambient Monitoring and Assessment program. Arsenic, boron, and lead were trace elements that most frequently occurred at high concentrations. Aluminum, antimony, and nickel also were detected at high concentrations, but in less than 1% of the primary aquifers. Groundwater samples from 32 public-supply wells were analyzed for trace elements. Arsenic concentrations above the maximum contaminant level (MCL) were measured at four public-supply wells, while boron concentrations above the detection level for the purpose of reporting (DLR) were measured at 19 wells. Iron concentrations above the secondary maximum contaminant level (SMCL)[5] were measured at seven wells, and manganese concentrations above the SMCL were measured at 17 wells. Vanadium and chromium (VI) concentrations above their DLR were measured at nine and 48 public-supply wells, respectively.

Future projects will consider the proximity of hydrologic resources along the preferred alignment. Future coordination with governing agencies/bodies including the San Francisco Bay Regional Water Quality Control Board and SWRCB, may be required. Clean Water Act (CWA) Section 402 mandates permits for municipal stormwater discharges, which are regulated under the National Pollutant Discharge Elimination System General Permit for Municipal Separate Storm Sewer Systems. Section 402 also requires compliance with the National Pollutant Discharge Elimination System Construction General Permit during construction activities. In the event in water work is required, compliance with CWA Section 401 will require obtaining a Regional Water Quality Certification.

[5] A primary maximum contaminant level (PMCL or MCL) is a drinking water standard based on health concerns, whereas a secondary maximum contaminant level (SMCL) is a drinking water standard based on aesthetics.

4.1.9 Geology, Soils, Seismicity, Minerals, and Paleontological Resources

Geology, Soils, and Seismicity

To assess the existing conditions related to geology, soils, and seismicity in the Study Area, information reviewed included regional and local geology and fault-earthquake hazard information from the California Geological Survey (CGS) and U.S. Geological Survey (USGS) mapping and technical investigations, soils data from NRCS, and city and county planning documents.

The Study Area is in a geologically young and seismically active region traversed by several active faults and areas found by CGS to be active under the Alquist-Priolo Earthquake Fault Zoning Act (Figure 4-12). Due to the proximity to regional and local fault systems, the Study Area is subject to seismic hazards, including surface rupture, ground shaking, liquefaction (Figure 4-13), and seismically induced landslides (Figure 4-14).

> The Study Area is subject to seismic hazards, including surface rupture, ground shaking, liquefaction, and seismically induced landslides.

The majority of the Study Area is underlain with soils with a Low to Moderate shrink/swell potential but also contains soils with a High to Very High shrink/swell potential along several alignment (Figure 4-15). In addition, the majority of the Study Area is underlain with soils with a Slight to Moderate susceptibility to erosion by water, but there are also soils with a Severe to Very Severe susceptibility to erosion by water (Figure 4-16).

Future projects will further evaluate the scope of potential geology, soils, and seismicity-related impacts, including risks related to landslides, surface fault rupture, liquefaction, and lateral spreading.

Figure 4-12. Regional Fault Map

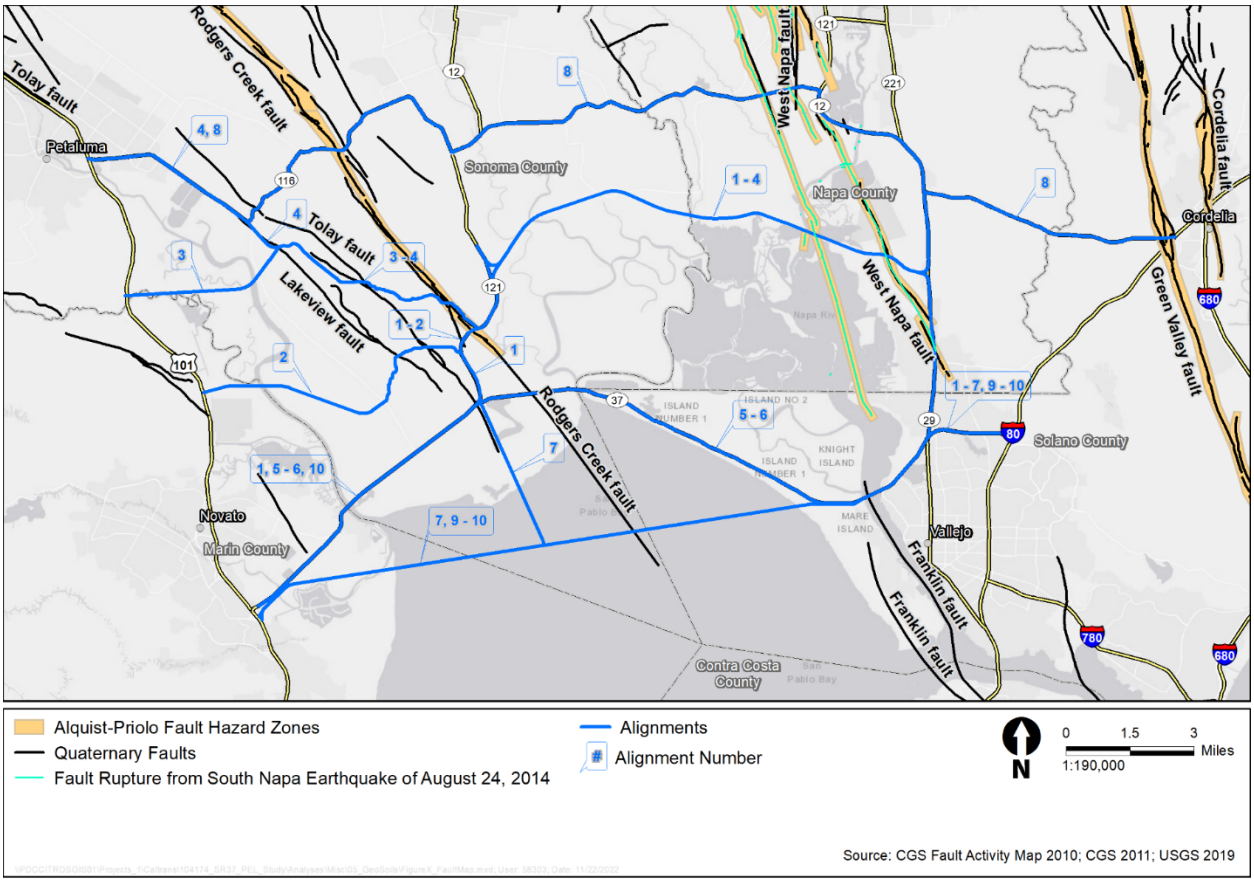


Figure 4-13. Liquefaction Susceptibility Map

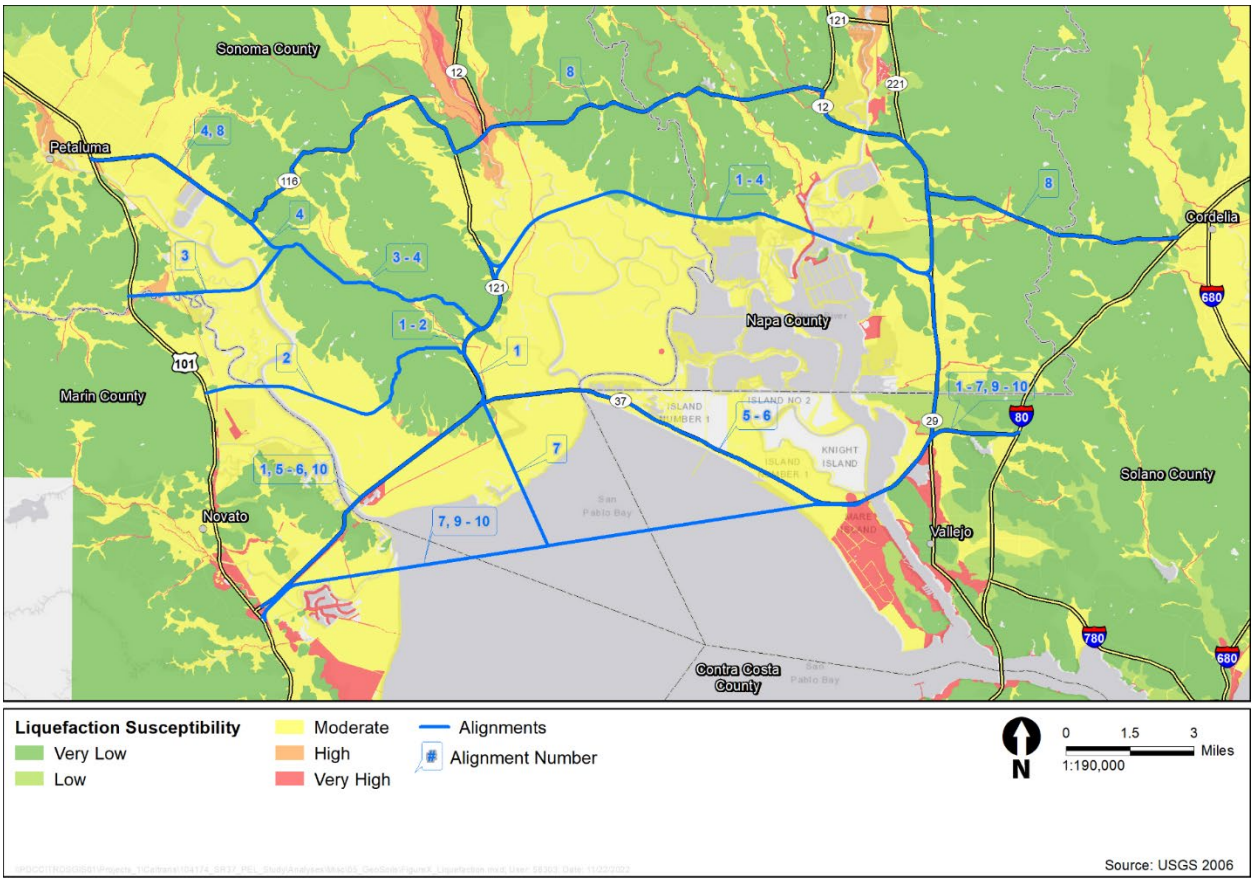


Figure 4-14. Landslide Susceptibility

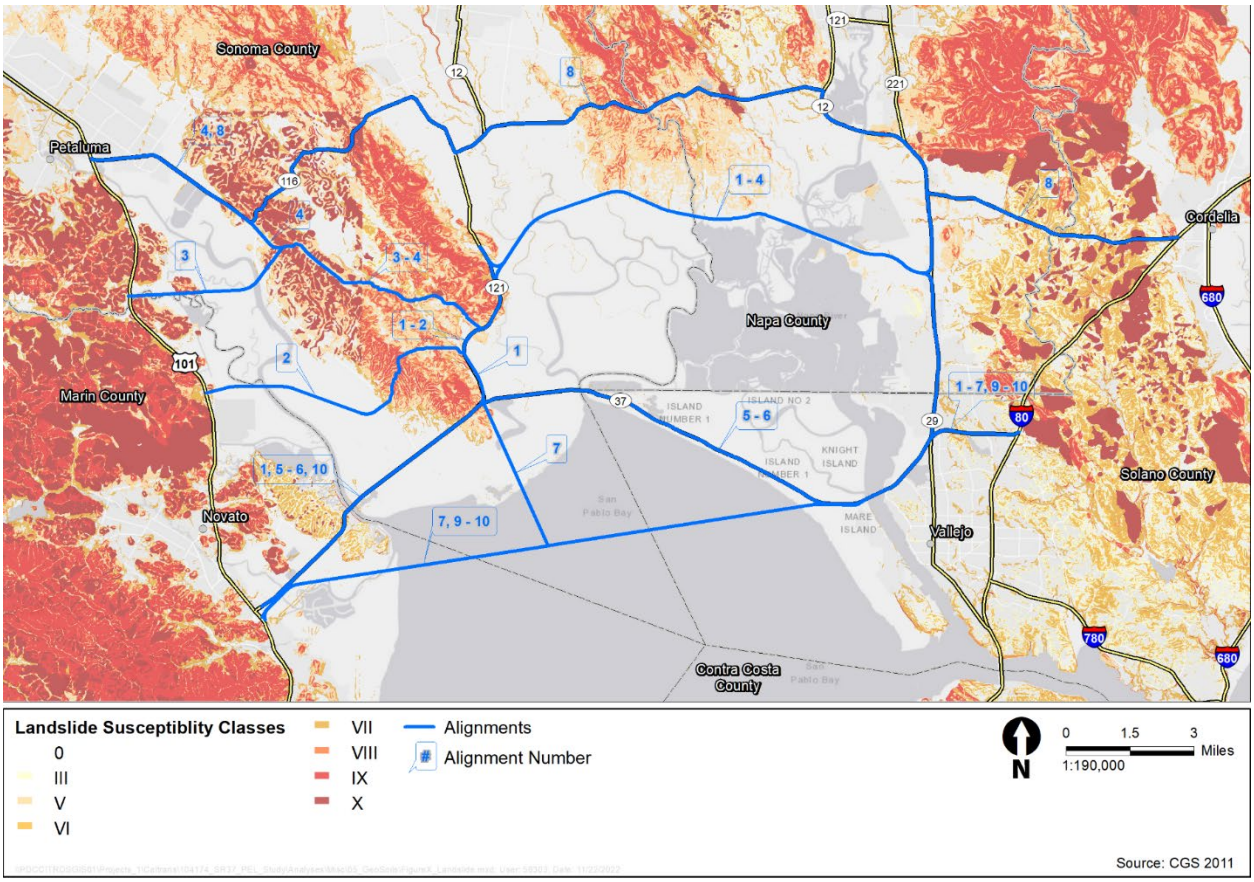


Figure 4-15. Shrink/Swell Potential

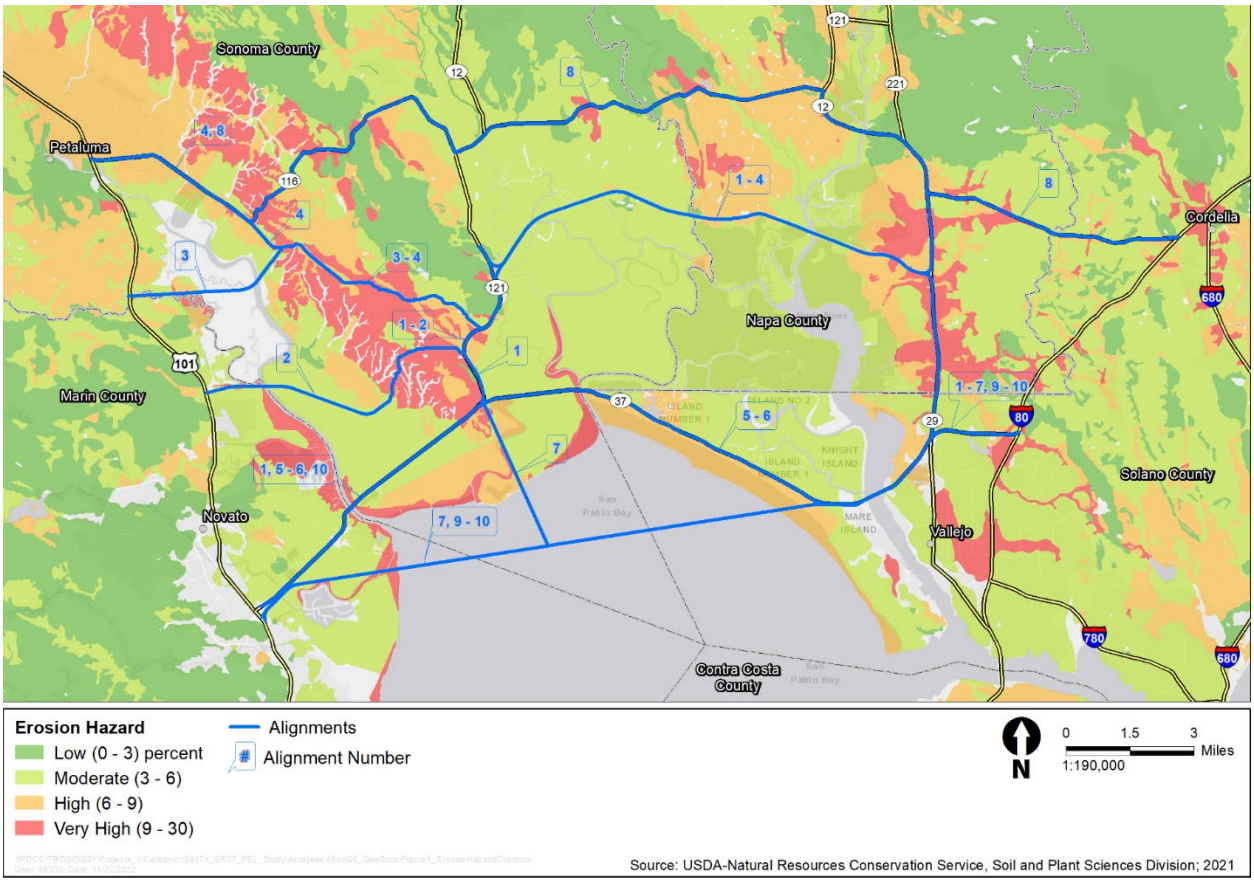
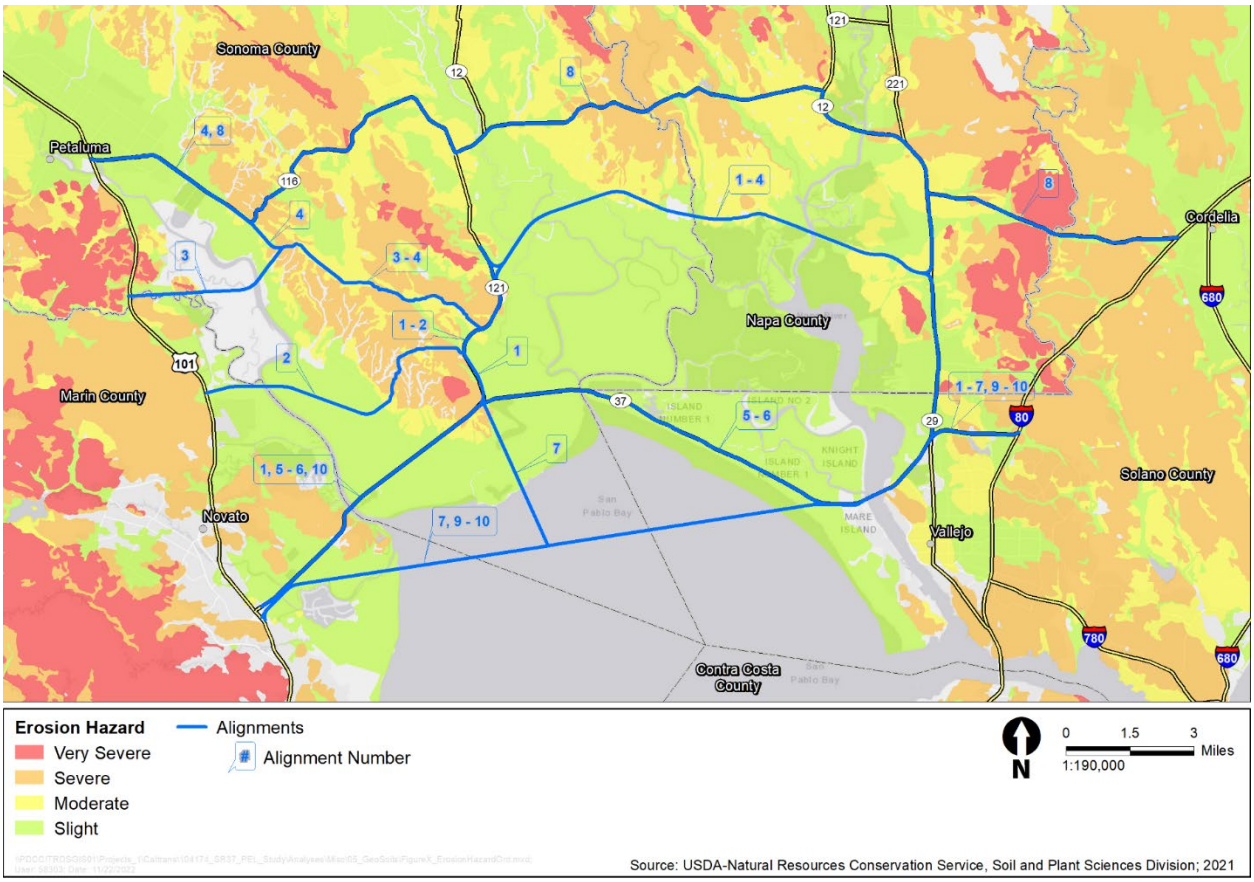


Figure 4-16. Water Erosion Hazard Map

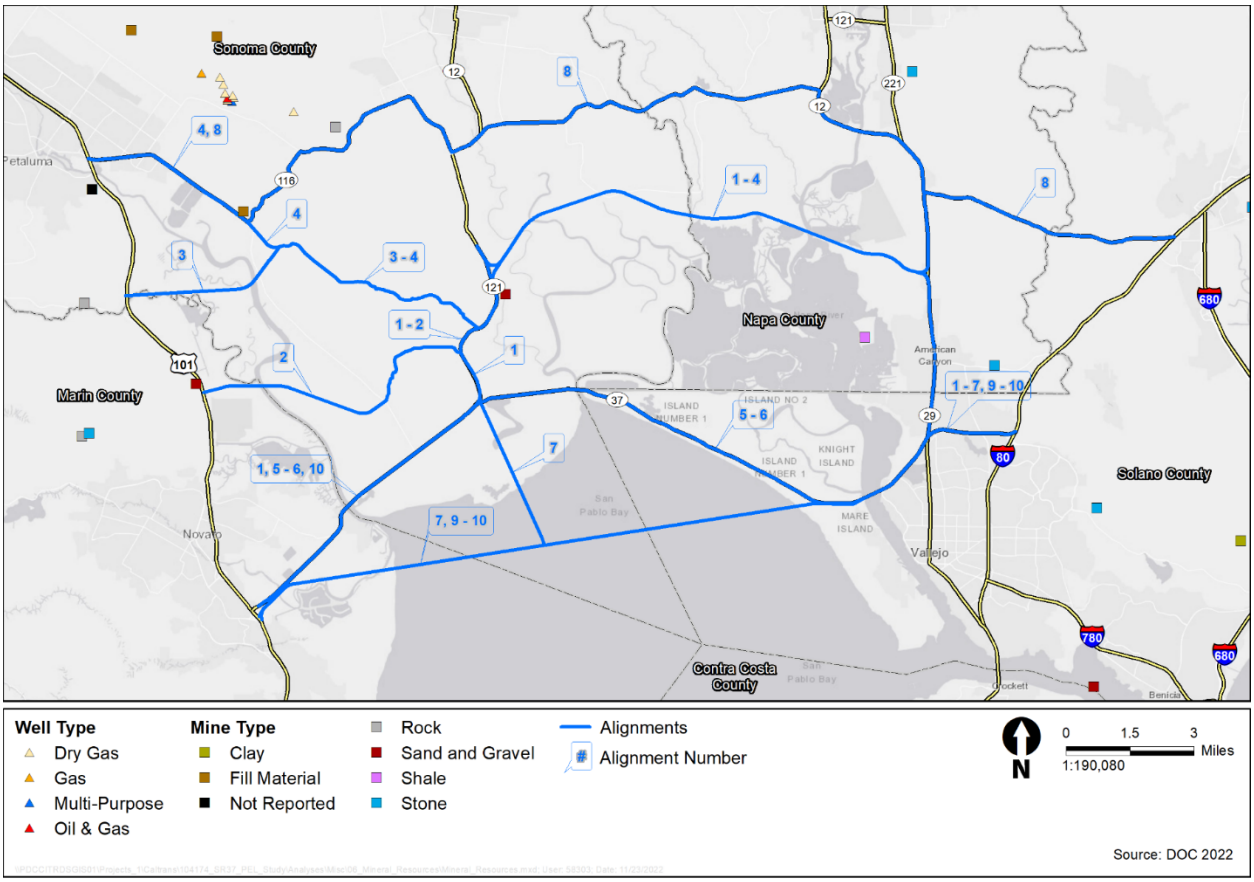


Mineral Resources

Information reviewed to identify mineral resources included DOC map data in GIS format showing the location of mines, oil and gas wells, and quarries. Mineral resource zones (MRZs) were identified through consultation with CGS mapping. The mineral resources Study Area was overlaid on maps to identify where the alignments could disrupt access to these mineral resources.

All four counties in the Study Area contain mineral resources, including earth products, geothermal resources, mercury, calcium, and sulfur (Figure 4-17). Depending on the precise alignment, access to mineral resources could be affected. There are also oil and gas wells in the Study Area; however, the California Geologic Energy Management Division's well finder indicates all such oil and gas wells have been plugged.

Figure 4-17. Mineral Resources



The Study Area contains areas classified as MRZ-2, where geologic units are known to contain significant mineral deposits for potential future exploitation. In addition, there are areas classified as MRZ-3, where geologic units are known to contain mineral resources, but where the significance of the mineral resources is not known. Accordingly, it is likely that future projects could affect lands classified as MRZ-2 or MRZ-3 and could therefore restrict future access to mineral resources.

Future projects will further evaluate potential encroachment on existing mines, wells, quarries, or MRZs containing known or inferred significant mineral resources that could interfere with future access to these mineral resources. Future coordination with governing agencies/bodies may be required.

Paleontological Resources

The potential for paleontological resources to exist in the Study Area involved identifying the geologic units with potential to contain significant nonrenewable paleontological resources that could be damaged or destroyed by excavation or construction. Geologic units were identified through review of CGS regional mapping, as well as review of literature and the University of California Museum of Paleontology localities database. Based on this information, the potential

for a geologic unit to yield paleontological resources in future ground disturbance was assessed based on one of four sensitivity categories as defined by the Society of Vertebrate Paleontology: High, Undetermined, Low, or No Potential.

Geologic units in the Study Area are known to have yielded significant or unique paleontological resources and have high potential to contain unique paleontological resources. Fossils retrieved from these geologic units include vertebrate fossils, invertebrate fossils, plant fossils, and microfossils (i.e., small remains of bacteria, protists, fungi, animals, and plants).

Future projects will further evaluate construction on geologic units with high paleontological sensitivity that could result in damage to or destruction of this nonrenewable resource. Future coordination with governing agencies/bodies may be required.

4.1.10 Hazardous Materials

The Study Area for hazardous materials includes a one-mile buffer on either side of each alignment. To assess hazardous materials sites in the hazardous materials Study Area, datasets for the SWRCB Geotracker, California Department of Toxic Substances Control EnviroStor, oil and gas wells recorded by the California's Geologic Energy Management Division, and city and county zoning in GIS were overlaid with the footprint for the proposed alignments. In addition, the Hazardous Waste and Substances Sites List (Cortese list) was consulted to determine the presence or absence of Cortese list parcels in the Study Area.

Designated land uses in the hazardous materials Study Area are predominantly agricultural and residential (Figure 4-18); however, there are industrial land uses where hazardous materials could occur because of present or past land use.

Sites containing hazardous materials and underground storage tanks as well as sites with documented contamination occur in the Study Area (Figure 4-19). Review of the databases found 16 cleanup sites, 42 permitted underground storage tanks, 12 active underground storage sites, and 93 closed underground storage cases in the hazardous materials Study Area. These sites are clustered around urban areas, although a small number of such sites occur along SR 37, SR 116, SR 121, and SR 12 in rural areas. There were also 20 dry oil or gas wells mapped in the hazardous materials Study Area. No sites on the Cortese list occur in the Study Area.

Future projects will further evaluate the potential for encountering hazardous materials during ground disturbance. In areas of potential concern, project scope and design will be reviewed to ensure hazardous materials are avoided. Also, the potential for encountering oil and gas wells will be investigated and if found, additional coordination will occur with the well owner to determine if the well should be closed and abandoned or relocated.

Figure 4-18. Designated Land Uses

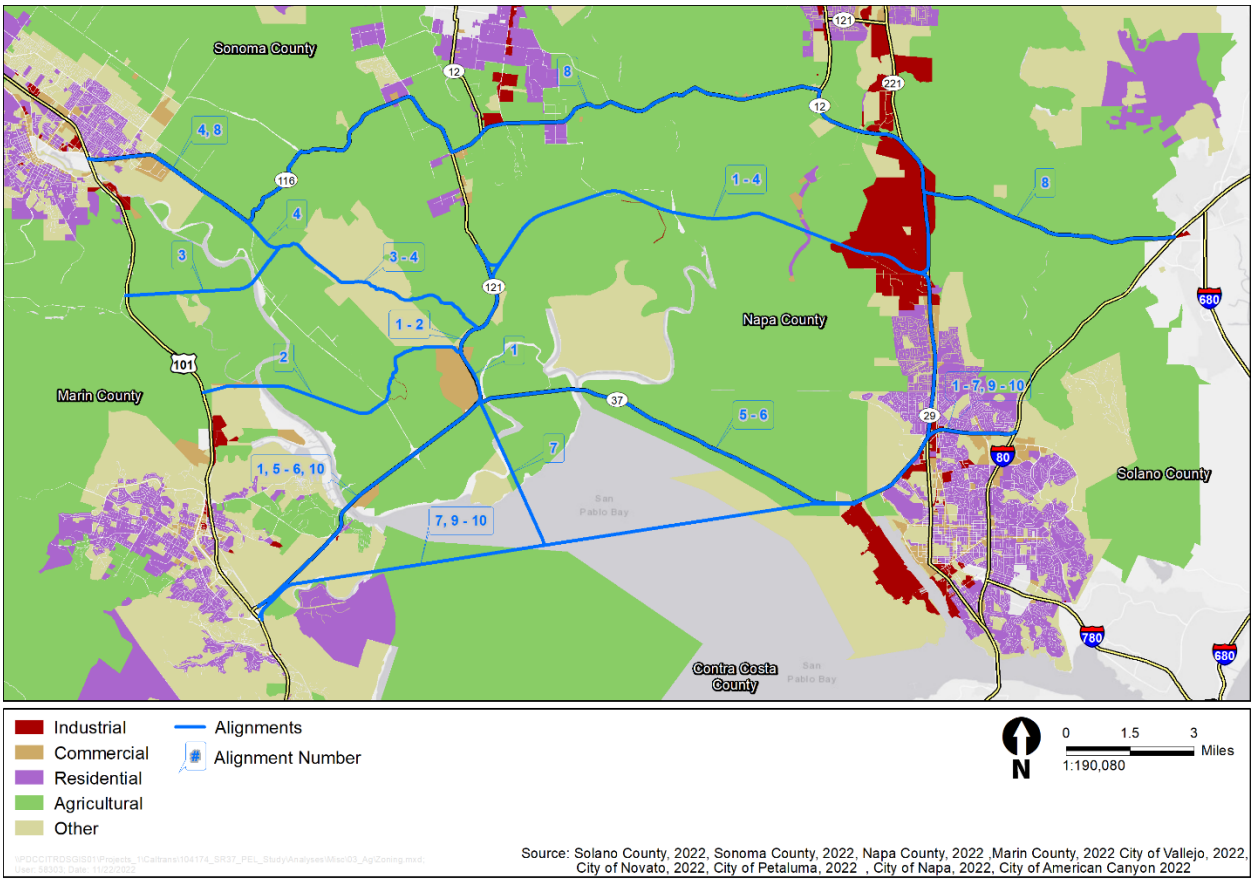
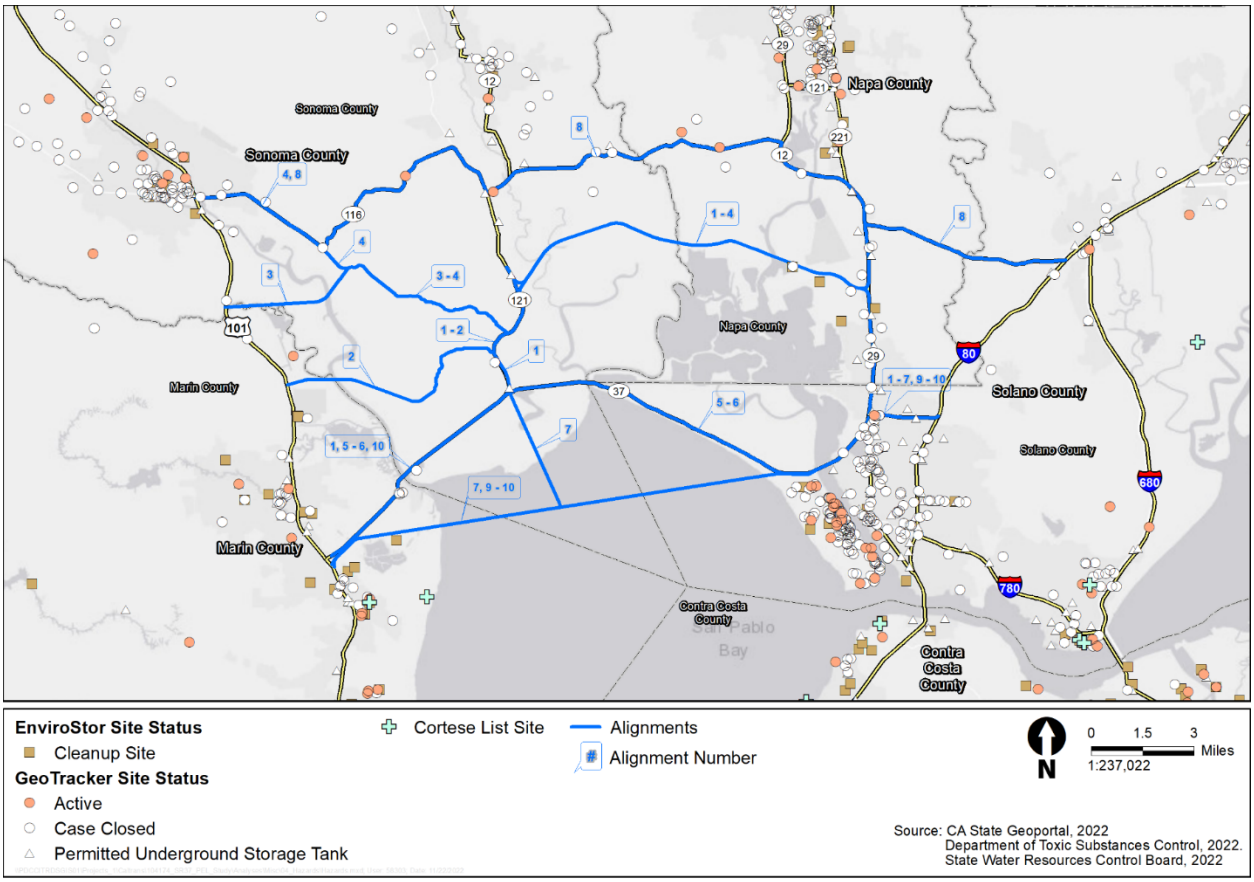


Figure 4-19. Hazardous Site Status



4.1.11 Threatened and Endangered Species, Special-Status Species, and Critical Habitat Assessment

The California Natural Diversity Database was used to identify the potential for federally and state-listed species to occur in the Study Area. USFWS and NMFS GIS data were also used to identify federal critical habitat in the Study Area. These databases were used to identify the total number of federally listed threatened or endangered species and state-listed species with the potential to occur in the ROW for each alignment and calculate the acreage of critical habitat that would be converted to a transportation use within the ROW for each alignment.

Forty-seven special-status species of mammals (two), birds (11), amphibians (six), insects (three), crustaceans (three), fish (six), and plants (16) were identified with the potential to occur in the Study Area.

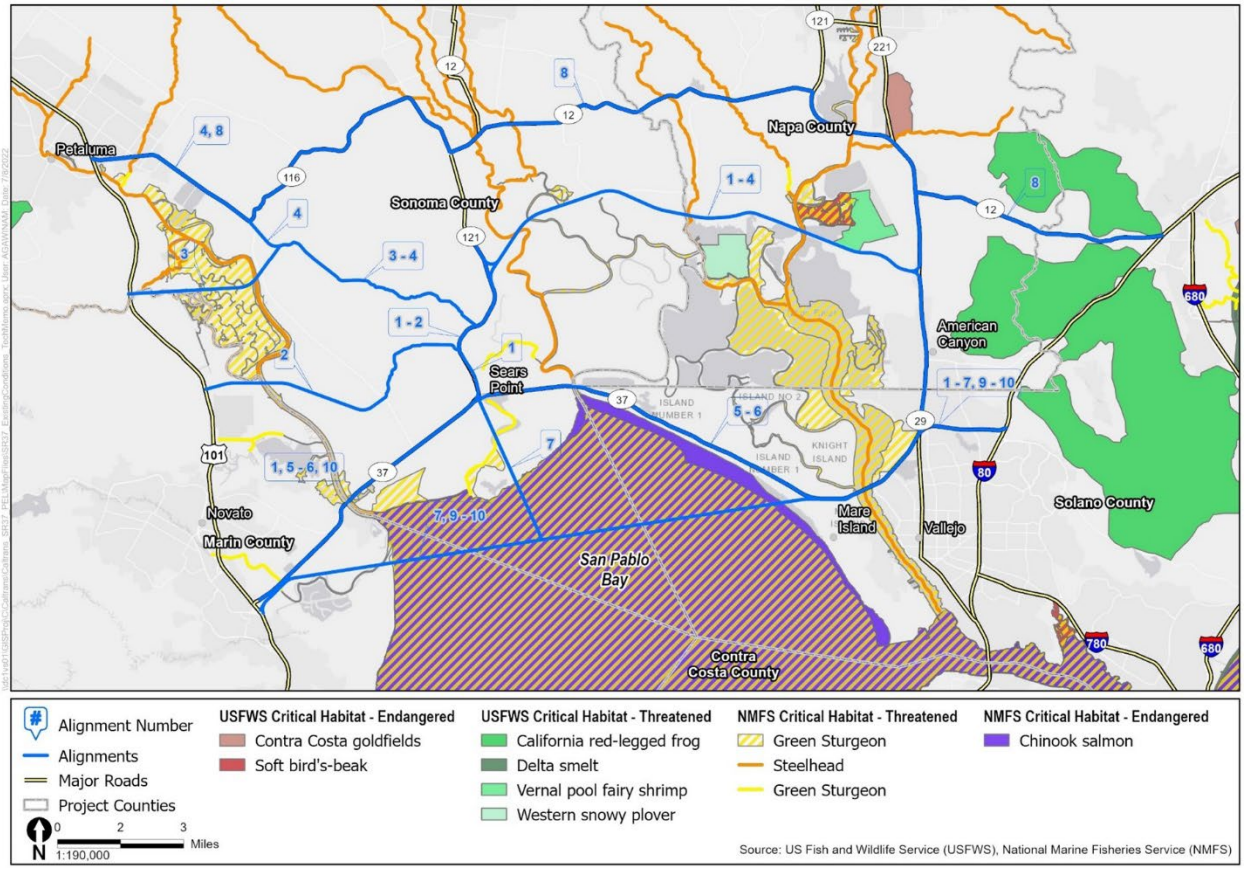
Critical habitat (Figure 4-20) was identified in the Study Area for western snowy plover (*Charadrius nivosus nivosus*), California red-legged frog (*Rana draytonii*), vernal pool fairy shrimp (*Branchinecta lynchi*), chinook salmon (*Oncorhynchus tshawytscha*), green sturgeon (*Acipenser medirostris*), steelhead (*Oncorhynchus mykiss irideus*), soft bird's beak (*Chloropyron molle* ssp. *molle*), and Contra Costa goldfields (*Lasthenia conjugens*).

While the 47 special-status species have the potential to occur in the Study Area, future projects will further evaluate if suitable habitat for these species is actually present. Future planning efforts will include additional desktop reviews and field surveys to confirm the presence of any special-status species that may be affected.

Future projects will evaluate if consultation and coordination is necessary with USFWS, NMFS, and the California Department of Fish and Wildlife, including Section 7 consultation under the Endangered Species Act. In addition, further evaluation of potential impacts on special-status species will be needed as applicable in the NEPA analysis, to provide a more detailed determination regarding potential impacts on special-status species and critical habitat, and to identify any appropriate mitigation measures.

> Forty-seven special-status wildlife and plant species and critical habitat occur in the Study Area.

Figure 4-20. Critical Habitat in the Study Area



4.1.12 Bird Habitat

To determine the potential presence of migratory birds and distribution of high-priority long-term tidal marsh bird habitat in the Study Area, reviews were conducted of the USFWS Information for Planning and Consultation tool and GIS data from Point Blue Conservation Science.

The area surrounding San Pablo Bay provides critical and important marsh bird and waterfowl habitat, including freshwater wetlands, tidal saltmarsh, and tidally exposed mudflats. The San Pablo Bay NWR, Petaluma Marsh Wildlife Area, and Napa-Sonoma Marsh Wildlife Area have been established to preserve land as open space to support migratory bird and wetland habitat.

The area surrounding San Pablo Bay provides critical and important marsh bird and waterfowl habitat.

The San Pablo Bay wetlands support almost the entire range of the endemic San Pablo song sparrow (*Melospiza melodia* ssp. *samuelis*) and about half the global population of the California black rail (*Laterallus jamaicensis coturniculus*). These wetlands are regionally significant for several bird species, such as the bufflehead (*Bucephala albeol*), western snowy plover (*Charadrius nivosus nivosus*), song sparrow (*Melospiza melodia*), burrowing owl (*Athene cunicularia*), tricolored blackbird (*Agelaius tricolor*), canvasback (*Aythya valisineria*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*).

An additional 35 migratory bird species were identified with potential to occur in the Study Area (Table BH-1 in Appendix C). Higher-priority long-term bird habitat is primarily concentrated along the coastline of San Pablo Bay and its tributaries, the Petaluma River, Tolay Creek, Sonoma Creek, and Napa River. High-priority bird habitat is concentrated along the Petaluma River to its confluence with San Pablo Bay. Outside of these areas, most of the remaining portions of the Study Area are considered low-priority bird habitat, primarily in agricultural areas.

Future projects will further evaluate the presence of high-priority bird habitat and migratory birds along proposed alignments and potential adverse impacts on bird habitat. Future projects will also include field surveys to identify and map migratory bird and nest locations, assessment of potential impacts on bird habitat and migratory birds, and identify appropriate mitigation measures, as applicable under both the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

4.1.13 Vegetation

Assessing existing vegetation cover in the Study Area entailed reviewing GIS data from the U.S. Forest Service's Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) dataset. The CALVEG GIS data was used to identify the total acreage of each type of vegetative cover in the Study Area.

Much of the natural vegetation in the Study Area has been converted to agricultural use; suburban, commercial, and residential areas; urban development; and non-native ornamental vegetation. However, the Study Area is interspersed with open space areas with native vegetation. The primary native plant communities are grasslands, coastal scrub, woodlands, riparian, and wetlands.

The CALVEG data identified four vegetation classifications present in the Study Area: hardwood forest/woodland, herbaceous, mixed conifer and hardwood forest/woodland, and shrub (Figure 4-21). Herbaceous vegetation is the most prevalent vegetation type and is present in more than half of the Study Area (56%). Approximately 27% of the native vegetation in the Study Area has been converted to agriculture.

Future projects will further evaluate the presence of undisturbed, native vegetation along proposed alignments and the potential adverse impacts of removal of such vegetation. This evaluation will also identify appropriate mitigation measures.

4.1.14 Wetlands and Waters of the U.S.

Information about the distribution of streams, potential wetlands, and waters of the U.S. in the Study Area is based on GIS data from the USGS National Hydrography Dataset, as well as the presence of wetlands based on data from the California Aquatic Resource Inventory (CARI) and the National Wetlands Inventory (NWI). The wetlands present have been classified with the Cowardin classification system. A desktop review based upon CARI and NWI GIS data was conducted to identify the total acreage of wetlands by Cowardin classification in the Study Area. USCG-regulated coastal channels were also identified.

Surface waters in the Study Area include the San Pablo Bay and its tributaries, including Novato Creek, Petaluma River, Tolay Creek, Sonoma Creek, and the Napa River. In addition, there are numerous other named and unnamed streams that drain into these tributaries. Wetlands in the Study Area are associated with these surface waters. Based on a review of the NWI and CARI data, 49,449 acres of wetlands are present within the Study Area (Figure 4-22). Approximately 65% of the wetlands in the Study Area are part of the Estuarine System, 20% are part of the Palustrine System, 12% are part of the Lacustrine System, and 3% are part of the Riverine System. In addition, one USCG coastal maintained channel is in the Study Area, which begins near the mouth of the Petaluma River.

Figure 4-21. CALVEG Classification of Existing Vegetation

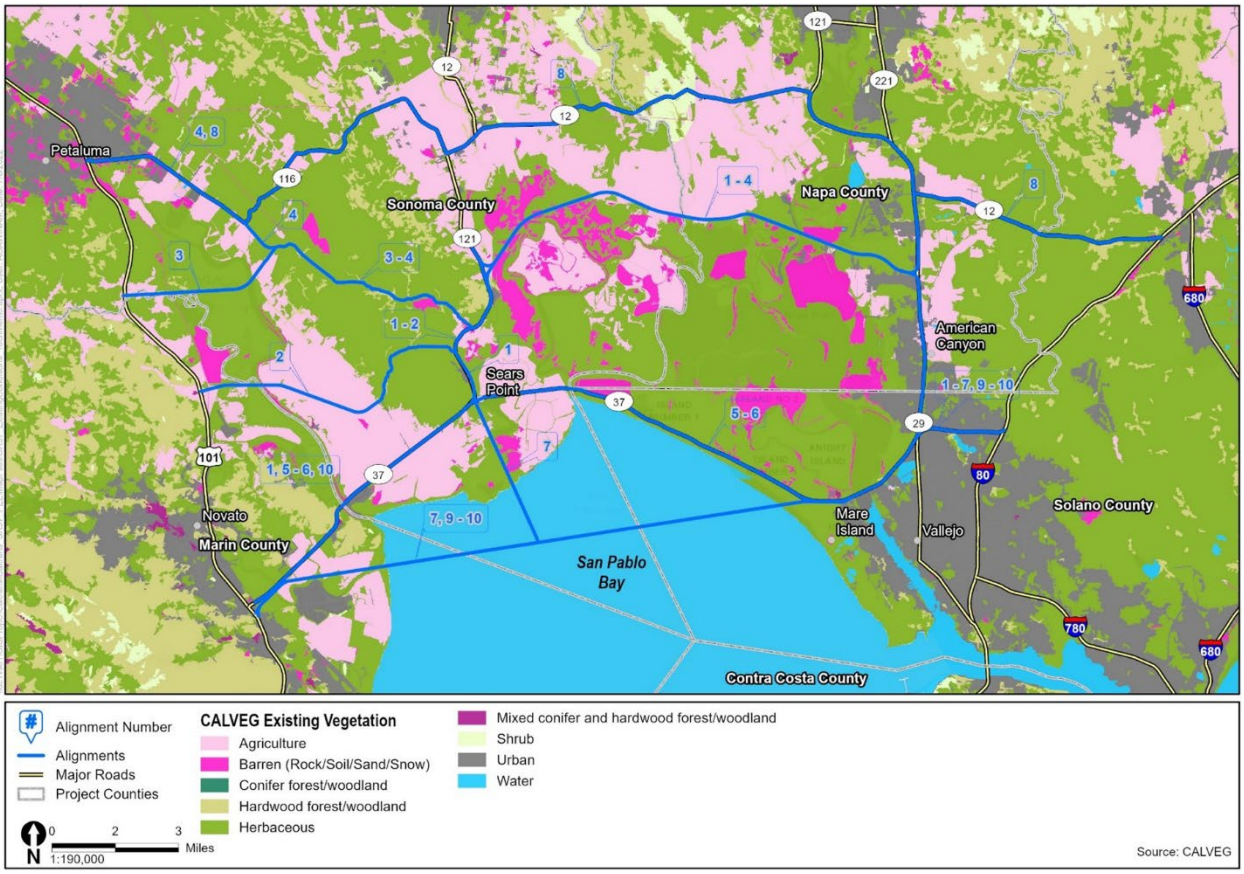
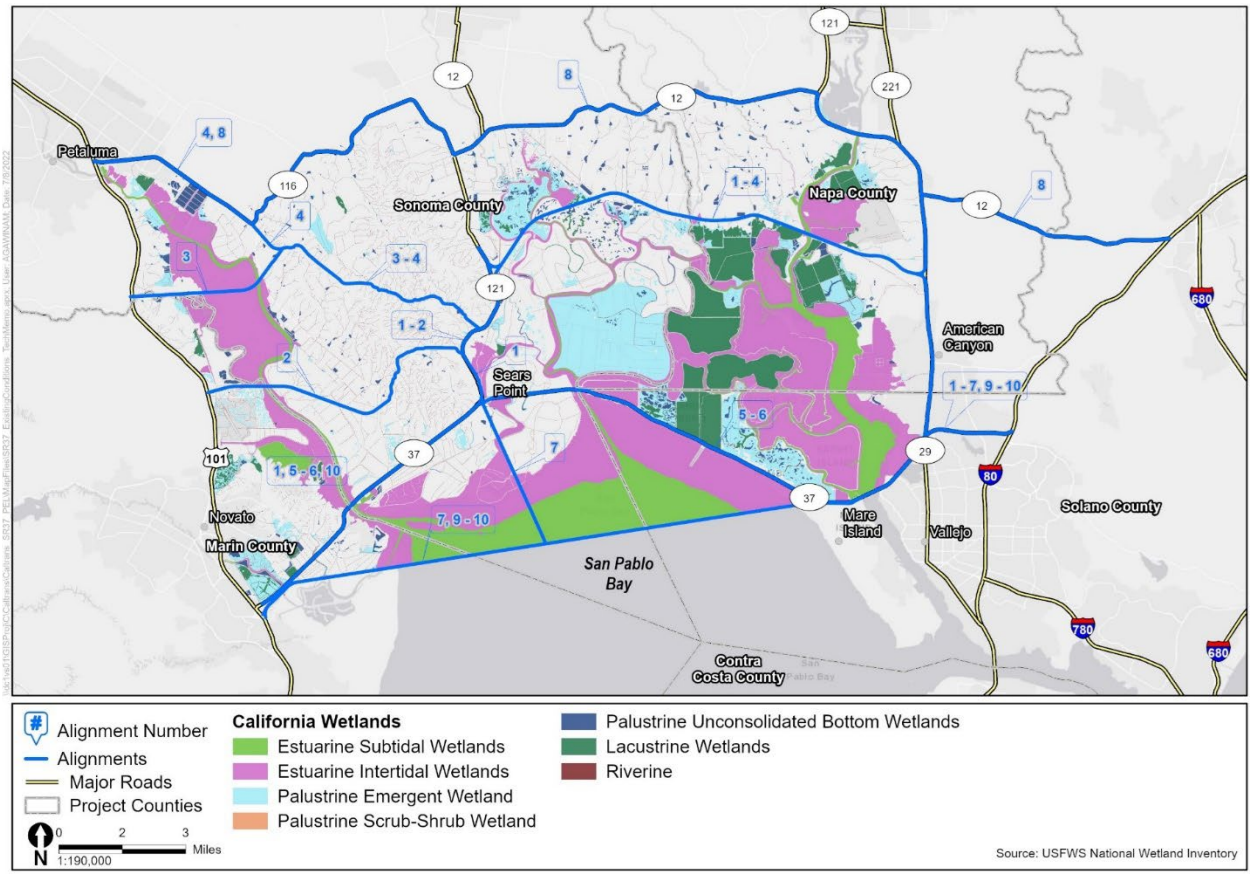


Figure 4-22. California Wetlands



Future projects will further evaluate the presence of wetlands and waters of the U.S. along the proposed alignments and evaluate the potential impacts as a result of project construction. A field survey will be necessary to delineate the location of waters of the U.S. and jurisdictional wetlands. The results of the delineation would be used to identify where impacts on waters of the U.S. and jurisdictional wetlands would occur under any future project and could include the following:

- The potential discharge of dredged or fill materials within waters of the U.S. or jurisdictional wetlands, would require a CWA Section 404 permit from USACE and CWA Section 401 certification from the Regional Water Quality Control Boards prior to construction.
- The need for an Individual Permit from USACE and demonstration that the alignment is the least environmentally damaging practicable alternative for the CWA Section 404 permit.

In addition, future projects will evaluate if a new bridge crossing over a navigable water would require a USCG bridge permit prior to construction and if coordination with the USCG would be required to determine the appropriate timing of the bridge permit application and public advertisement of the proposed new bridge crossing.

4.1.15 Ecological Resiliency and Connectivity

This analysis identifies existing ecological resiliency and connectivity in the Study Area. There are several ecological systems in the Study Area; however, this discussion focuses on rivers and creeks, tidal marsh, tidal bay flats, shallow bay, terrestrial corridors, and critical linkages.

> Tidal marshes provide spawning ground for aquatic species and rest stops for migratory birds.

Information regarding existing ecological systems and GIS data from EcoAtlas, California Biogeographic Information and Observation System, and Conservation Lands Network was collected for the Study Area. GIS data was used to identify important ecological systems and their potential resilience to sea level rise in the Study Area.

- **Rivers/Creeks.** Several rivers and creeks (Petaluma River, Tolay Creek, Sonoma Creek, Napa River) in the Study Area provide freshwater connection to saltwater tidal flats and open bay. Rivers and creeks supply nutrients from upland riparian areas and carry these nutrients downstream into the estuarine tidal marsh and tidal bay flats. Rivers and creeks also provide spawning habitat for migratory aquatic species that live in the ocean and travel back to freshwater areas to spawn. The Petaluma River, Tolay Creek, Sonoma Creek, and Napa River provide habitat for a wide range of plant and animal species, including threatened or endangered species. Outside of projected future inundation areas, upland reaches would retain their functions; however, these resources are the pathways for the most part for greater inundation into uplands, and the conversion from fresh to salt/brackish water will have dramatic effects on the surrounding wildlife.
- **Tidal Marsh.** Tidal marsh exists along a majority of the northern shoreline of San Pablo Bay and along existing sloughs, creeks, and rivers that flow into the bay. Tidal marshes provide spawning ground for aquatic species and rest stops for migratory birds. Additionally, tidal marshes play an important role in flood protection of uplands by storing groundwater and lessening storm surges. The area surrounding San Pablo Bay in the Study Area provides critical and important marsh bird and waterfowl habitat. A majority of the existing tidal marsh near the bay shoreline would not be resilient to sea level rise and would likely be flooded and submerged.
- **Tidal Bay Flats.** Tidal bay flats are created by river runoff or inflow from tides, which deposit sediments such as mud or sand. Tidal flats are an important ecosystem that generates algae growth, providing food to crustaceans that feed shorebirds, wading birds, and fish. These areas contain federal and state protected threatened and endangered species. Tidal bay flats provide an ecological connection between tidal marsh and shallow bay. Existing tidal bay flats would not be resilient and would likely be submerged as sea levels rise and become shallow bay. However, existing upland areas would likely transition to tidal bay flats in some locations over time, especially in low-lying areas along creeks and rivers.
- **Shallow Bay.** The shallow bay areas are up to six feet deep where the land is inundated with water during high and low tide and can contain some algae and vegetation

growth due to sunlight penetration. This area is also habitat for marine species that migrate close to or within brackish water for spawning or feeding. These areas also contain protected essential fish habitat species such as shrimp and other crustaceans. More than 90% of subtidal areas of the bay consist predominantly of soft-bottom substrates, but also include shellfish beds, submerged aquatic vegetation, shell deposits, rocky bottom, underwater pinnacles, and macroalgal beds. The shallow bay provides an ecological connection between tidal bay flats and deep water bay.

Critical linkage corridors associated with riparian areas would not be resilient to sea level rise.

- **Terrestrial Corridors.** Terrestrial corridors are essential corridors that allow migration and movement of terrestrial species from one upland to another and from upland to estuarine tidal areas. These areas are critical for maintaining ecological connectivity and diversity across the Study Area. These areas also contain federally and state-protected threatened and endangered species and provide foraging and refuge for terrestrial species. A substantial portion of the terrestrial corridors will remain resilient to sea level rise because they occur in uplands; however, each alignment could have a direct effect on continued uninterrupted terrestrial movement within the project footprint along migration routes.
- **Critical Linkages.** Critical linkages are areas that a high concentration of a variety of wildlife species utilize to travel from one area to another, often along streams with associated riparian corridors. These linkages are critical for providing passage for terrestrial species from uplands to the estuarine tidal marsh. These areas also provide shelter and food for migratory species in the area. Critical linkage corridors associated with riparian areas would not be resilient to sea level rise and may become narrower closer to the existing bay as sea level rise causes rivers and creeks to overtop their existing banks inundating some areas currently serving as routes that are above sea level for wildlife.

Future projects will consider the presence of these resource areas along the preferred alternative and evaluate the potential adverse impacts as a result of project construction to meet the purpose and need for resiliency and connectivity based on current conditions.

4.1.16 Tidal and Transition Zone Habitat

There are several types of tidal transition zones that occur in the Study Area. Information regarding existing habitat types and GIS data from EcoAtlas was used to identify tidal and transition zone habitats in the Study Area. The following definitions have been developed for the SR 37 PEL Study and are derived from the EcoAtlas online data.

- **Tidal Marsh Adjacent to Uplands**. The transition zone where tidal marsh is adjacent to upland areas in the Study Area provides moderate-quality transition zone and acts as a connection for terrestrial and aquatic migration.
- **Rivers and Creeks**. The transition zone where tidal influence affects rivers and creeks in the Study Area along the northern portion of the bay provides a high-quality transition zone and connects freshwater areas with saltwater areas. This area acts as a connection from uplands to tidal marsh and is critical for many migratory terrestrial and aquatic species.
- **Tidal Marsh Adjacent to Tidal Bay Flats**. The transition zone where tidal marsh is adjacent to tidal bay flats in the Study Area provides a high-quality transition zone and provides spawning ground for aquatic species and rest stops for migratory birds.
- **Tidal Bay Flats Adjacent to Shallow Bay**. The transition zone where tidal bay flats are adjacent to shallow bay in the Study Area provides a high-quality transition zone between fully submerged areas and areas subject to tidal inundation. Tidal bay flats are an important ecosystem connection creating algae growth that provides food to crustaceans, which feed shorebirds, wading birds, and fish.
- **Tidal Marsh Adjacent to Agriculture**. The transition zone where tidal marsh is adjacent to agriculture in the Study Area provides a moderate-quality transition zone. This transition zone can be large and provides a migration corridor for terrestrial species to interact with the estuarine areas.
- **Tidal Marsh Adjacent to Urban**. The transition zone where tidal marsh is adjacent to urban areas does not provide a high-quality ecological transition zone. This transition area provides minimal opportunity for habitat restoration or natural habitat transition to occur with future sea level rise.

Future projects will consider the presence of tidal marsh and transition zones along the preferred alignment and evaluate the potential adverse impacts as a result of project construction.

4.1.17 Noise

The Study Area was evaluated to determine existing general sources of noise, including highway facilities, and existing land uses. Sources and general types of receptors were identified for each county and city jurisdiction using aerial imagery.

Traffic noise levels for existing conditions were based on annual traffic census data developed by Caltrans. Traffic volumes were based on average daily traffic counted during 2019. Using this information, traffic noise levels were calculated from data tables developed from the FHWA Traffic Noise Model Version 2.5.

Vehicle traffic is a noise source along all roadways in the Study Area. Some general aviation noise is generated from the use of airports like the Sonoma Skypark (about 0.8 mile north of SR 12/SR 121 near Schellville), Sonoma Valley Airport (about 1.2 miles south of SR 12/SR 121), Napa County Airport (about 0.8 mile west of SR 12/SR 29 near American Canyon), and Gnoss Field (about 3 miles north of SR 37 near Novato). Rail noise is also generated along US 101 to SR 121. The Sonoma-Marin Area Rail Transit (SMART) train also parallels US 101 in some areas, which produces noise in the corridor.

Traffic noise levels under future projects will be measured to determine whether new noise barriers or retrofits to existing noise barriers should be considered. Such a study will include a noise monitoring program to establish existing noise levels and will also be used to validate traffic noise models. Based on traffic noise modeling, the study will determine if traffic noise impacts would occur based on exceedance of noise abatement criteria at noise-sensitive receptors established in the Caltrans Protocol. The technical study will also determine locations where a substantial increase relative to existing noise levels would occur.

4.1.18 Recreation, Section 4(f), and Section 6(f)

The Study Area was evaluated to determine the presence and nature of resources that would be subject to review under Section 4(f) of the Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act. In addition, existing parks, trails, and recreational facilities in the Study Area were identified by reviewing local planning documents, and state, county, and publicly available information pertinent to recreational resources.

The Study Area encompasses a diverse array of recreational facilities and opportunities generally related to the natural environment associated with the San Pablo Bay and surrounding area. Forty-eight existing parks, trails, preserves, open space areas, marinas, boat launch sites, and recreational facilities were identified in the Study Area. Publicly owned recreation resources are operated by California Department of Parks and Recreation; the Counties of Marin, Sonoma, and Napa (Figure 4-23); and the Cities of Novato, Petaluma, American Canyon, and Vallejo (Figure 4-24). Publicly available recreation resources are also owned and operated by nonprofit organizations or other regional agencies (Figure 4-25). Also, a variety of privately

owned recreational resources are linked to the local economy such as a raceway, wineries, golf courses, boat launches, and other attractions (Figure 4-26).

Future projects will further evaluate if the publicly owned parks, recreation areas, wildlife and waterfowl refuges are resources eligible for protection under Section 4(f) and if affected, what Section 4(f) analysis may be needed based on the potential impacts and approval required.

> The Study Area encompasses a diverse array of recreational facilities and opportunities related to the natural environment of San Pablo Bay and surroundings.

In addition, future projects will consider potential impacts on the San Pablo Bay NWR, a Section 6(f) property, currently traversed by the existing SR 37 (Figure 4-27). Section 6(f) prohibits conversion of property acquired or developed with Land and Water Conservation Fund grants to a non-recreational purpose without approval from the Department of the Interior's National Park Service and requires replacement of any converted lands.

Figure 4-23. State- and County-Operated Recreational Resources

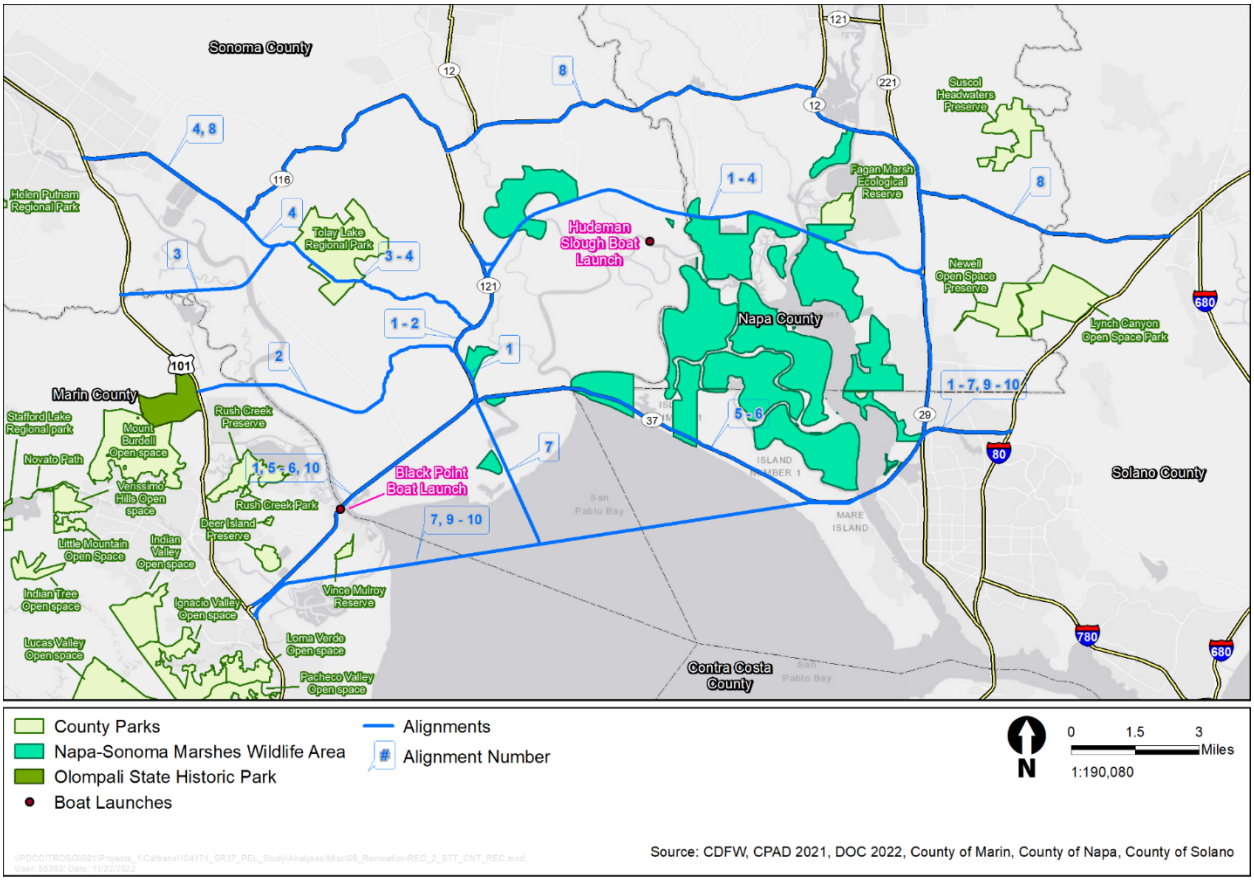


Figure 4-24. City-Operated Recreational Resources

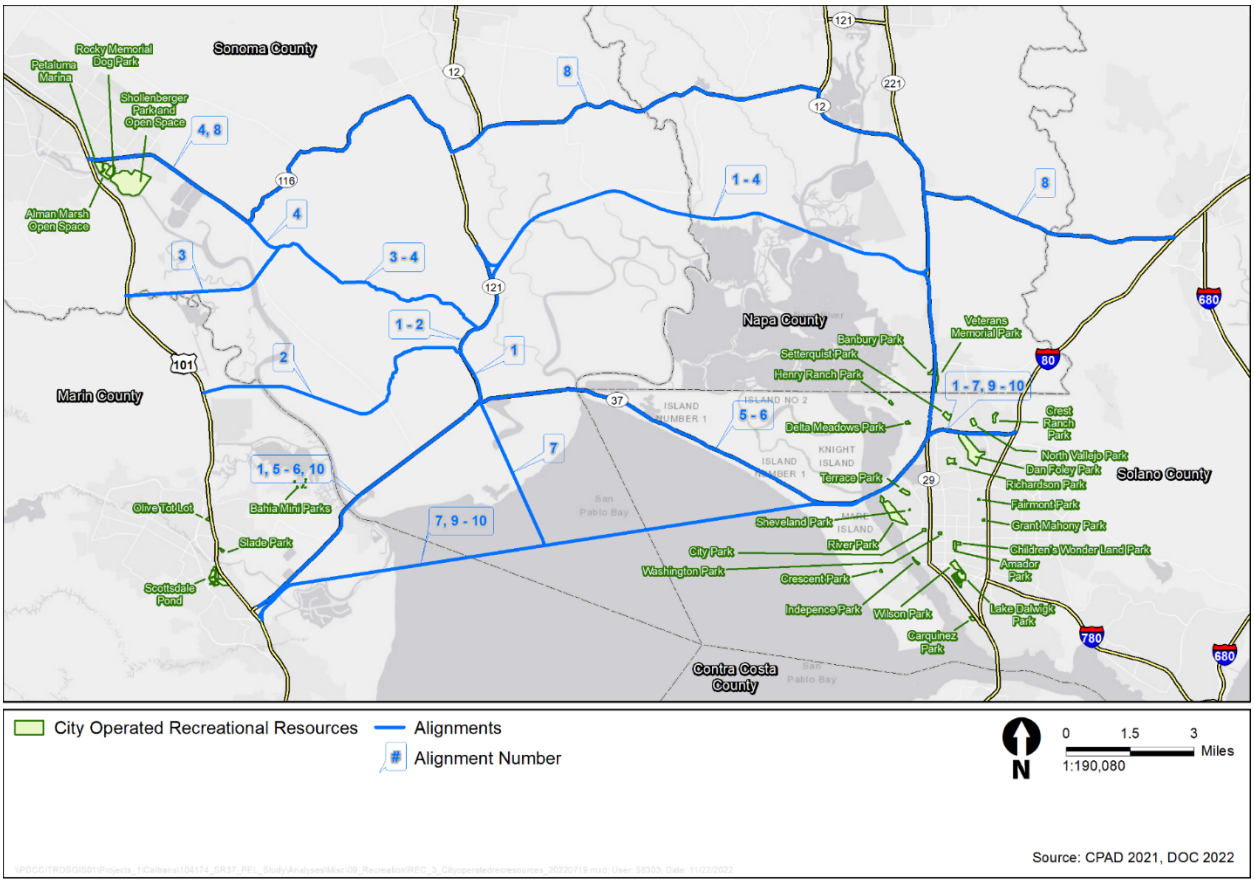


Figure 4-25. Other Regional Recreational Resources

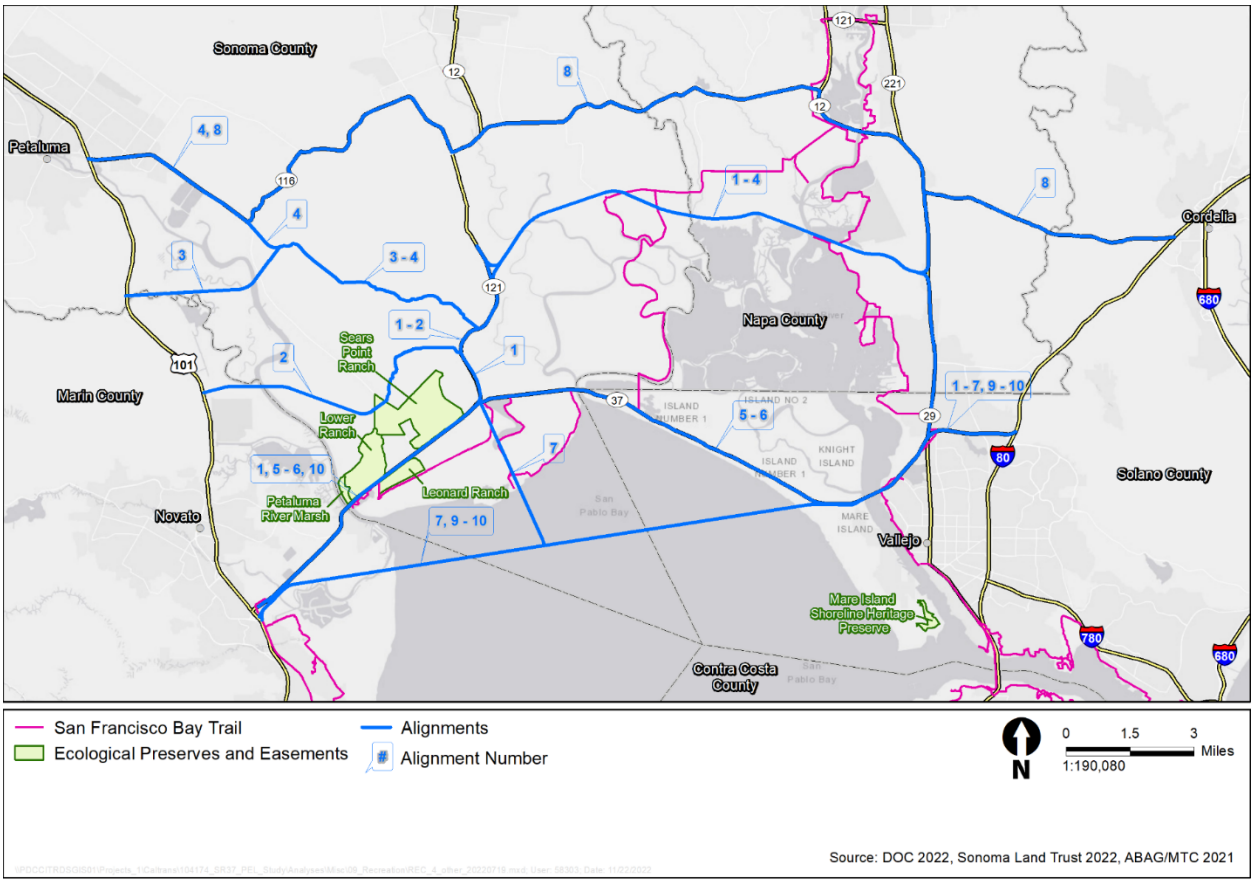


Figure 4-26. Privately Owned Facilities Used for Recreational Purposes

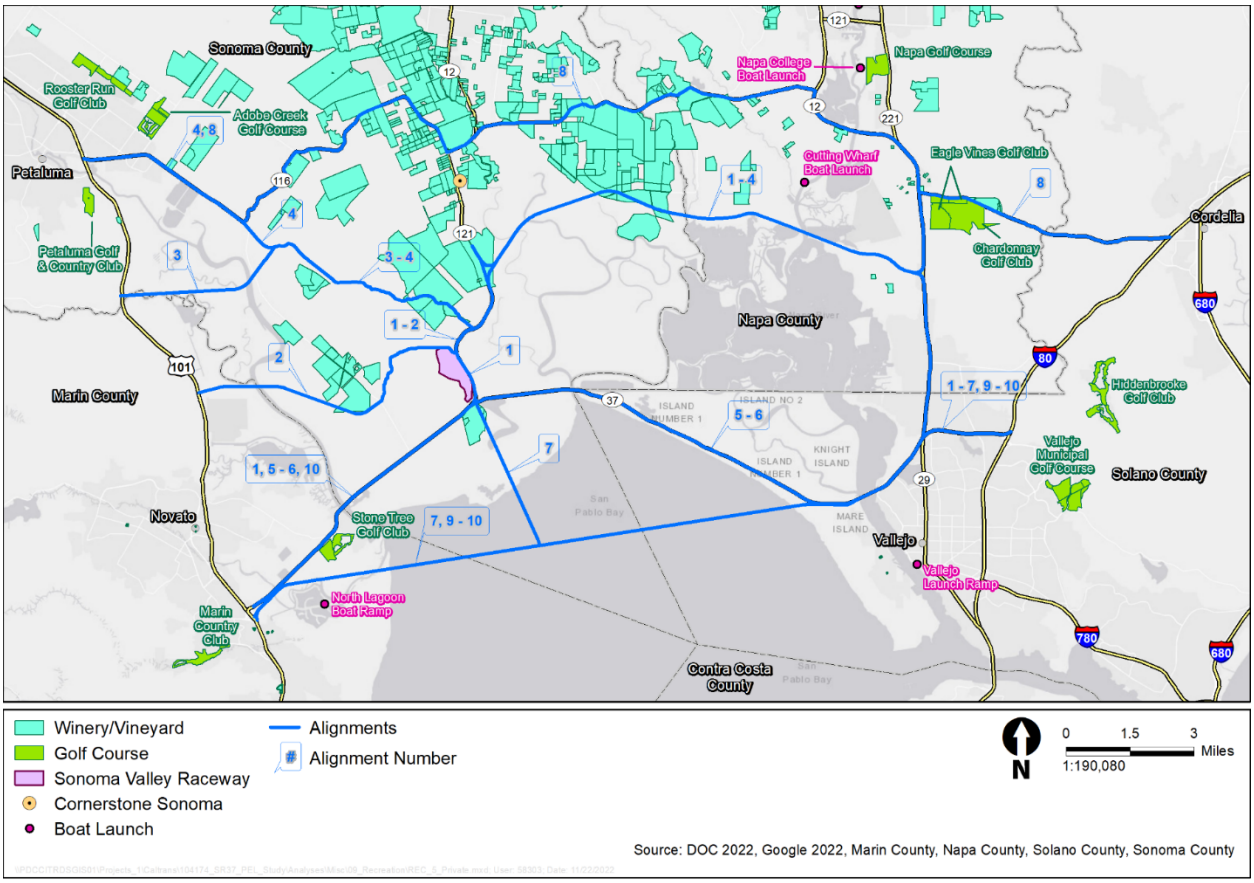
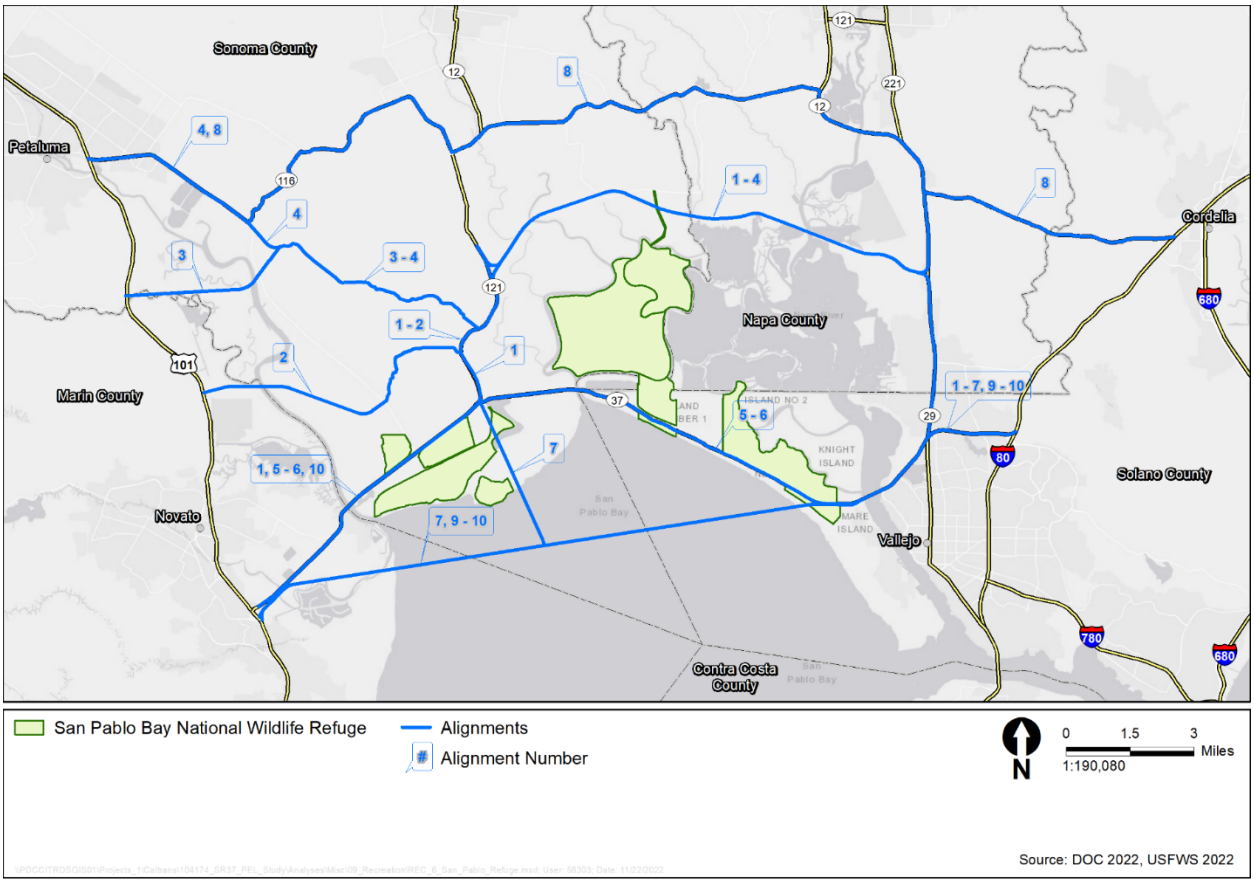


Figure 4-27. San Pablo Bay National Wildlife Refuge



4.1.19 Transportation

The existing transportation conditions in the Study Area were assessed based on qualitative and quantitative evaluation of publicly available information pertinent to the transportation topics listed and summarized below.

- Destination Access: GIS mapping of existing major destinations.
- Multimodal Opportunities: GIS mapping of existing facilities.
- Mobility: Measurement of volume, speed, and reliability for SR 37 obtained from the Caltrans Performance Measurement System. Occupancy estimates were obtained from *Plan Bay Area 2050 Draft Environmental Impact Report* and VMT estimates were obtained from the Caltrans Highway Performance Monitoring System and the MTC travel demand model.
- Safety: Data about the physical and operational conditions of the SR 37 corridor related to collisions or potential collision risk.

Destination Access

SR 37 serves as a gateway between many destinations on the east and west sides of the corridor. Key cities on the east side of the corridor include Vallejo, Benicia, American Canyon, Napa, and Fairfield, while key cities on the west side of the corridor include Novato, San Rafael, Petaluma, Sonoma, and Santa Rosa, as well as northern access to San Francisco via the Golden Gate Bridge. The SR 37 corridor serves key destinations that include employers such as businesses (e.g., pharmaceutical, industrial, warehousing), county government, educational institutions, shopping, entertainment, and recreation (Figure 4-28).

Multimodal Opportunities

SR 37 Roadway

SR 37 is an east-west corridor in the North Bay extending through four counties and connecting US 101 to I-80 with three distinct sections. The number of lanes and facility designation is different in each section (Figure 4-29). The western section extends 7.2 miles from US 101 in Novato to the signalized SR 121 intersection at Sears Point, as a four-lane expressway through Marin and Sonoma Counties. The middle section is 9.5 miles in length, extending east of SR 121 (Sears Point) as a two-lane conventional highway with a median barrier and crosses the Napa-Sonoma marshlands to Mare Island at Walnut Avenue interchange just west of the Napa River Bridge. The eastern section becomes a four-lane freeway at Mare Island and continues 2.1 miles east on mostly filled roadway and structures from the Napa River Bridge to I-80 in Solano County.

> The SR 37 corridor serves key destinations such as employers, county government, educational institutions, shopping, entertainment, and recreation.

Figure 4-28. Key Destinations in the Study Area

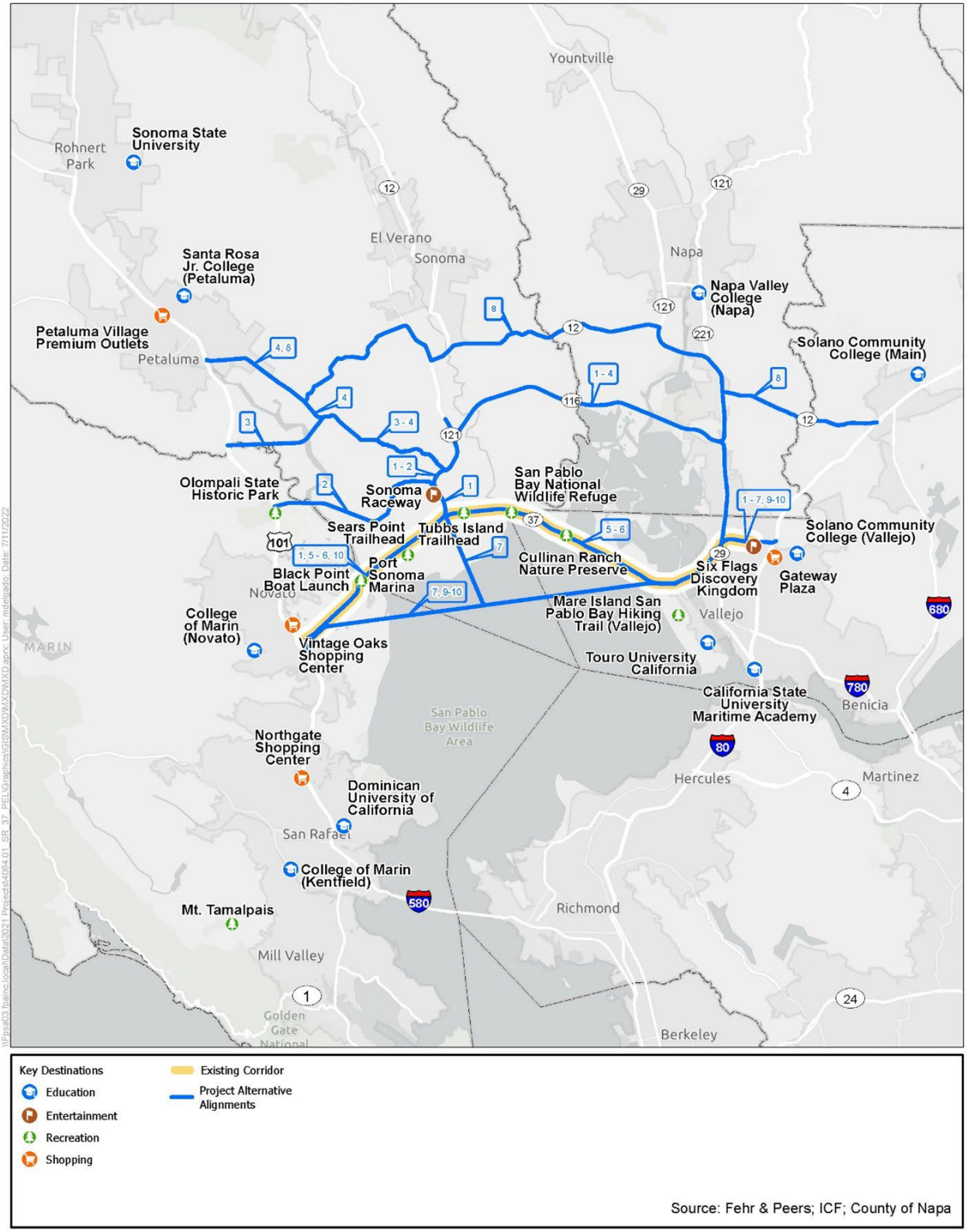


Figure 4-29. Sections of State Route 37

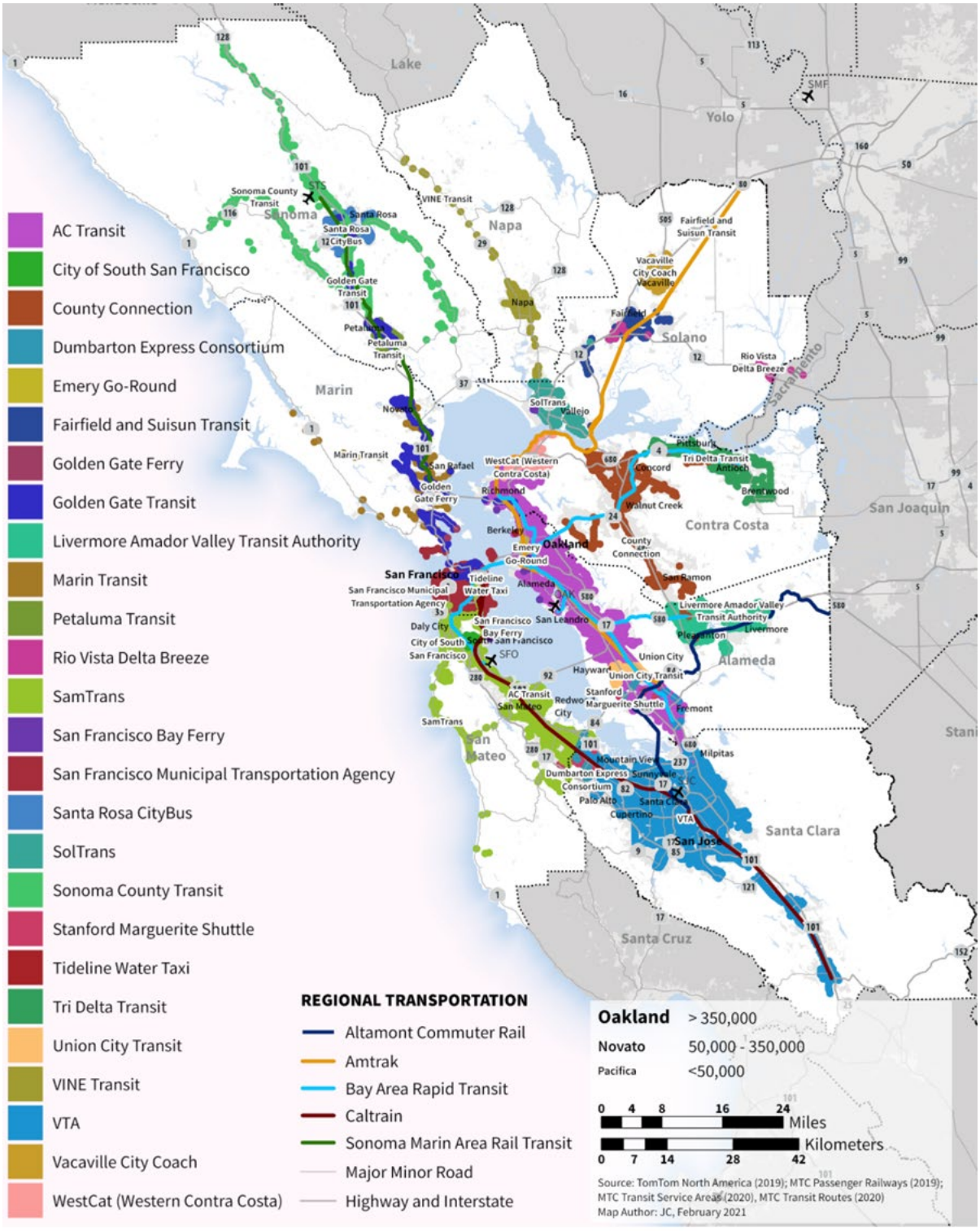
Roadway Network

The roadway network consists of two interstate freeways, US 101 and I-80, and 16 additional roadways that intersect SR 37. The majority of the roads in this network are two-lane local and collector roadways (13) with only one four-lane divided highway (SR 29) and two two-lane undivided highways (Lakeville Highway [SR 116] and at SR 121). Skaggs Island Road is a restricted access road that intersects SR 37 twice. Three driveways are accessed from SR 37—Tubbs Island trailhead and two parking areas for wildlife viewing along Sonoma Creek. The intersections vary in terms of access control, interchange type, and grade separation at SR 37.

Transit

There is no conventional transit service in the Study Area. Amtrak operates five buses daily in each direction of Thruway Bus service connecting the Amtrak train station in Martinez to Vallejo, Napa, Petaluma, Rohnert Park, Santa Rosa, and cities to the north such as Eureka. The buses use the SR 12 and SR 116 east-west corridor between Petaluma and Napa; however, a couple of the trips do not stop in Napa and could potentially use the direct route along SR 37. Due to the infrequency and limited destination access this service provides, there is a significant gap in the regional transit system along SR 37, as shown in Figure 4-30.

Figure 4-30. Regional Transportation



Rail

SMART operates a short-line freight rail service along its ROW from Novato-Hamilton Station east to near American Canyon. SMART also operates a north-south passenger service between Marin and Sonoma Counties, but there is no existing passenger rail service that parallels SR 37. SMART has identified opportunities to combine highway and rail facilities on the SR 37 segment between Novato and Sears Point (at SR 121), and to add a rail corridor along SR 37 between SR 121 and Vallejo.

SMART has identified opportunities to combine highway and rail facilities on the SR 37 segment between Novato and Sears Point at SR 121 and to add a rail corridor along SR 37 between SR 121 and Vallejo.

Pedestrian and Bicycle

There are few pedestrian facilities on SR 37 in the Study Area except along the Napa River bridge and the approaches to that bridge. Recreational trails include the Sears Point Trail, Tubbs Island Trail, SMART Trail, and San Francisco Bay Trail. Sidewalks are also located along the SR 37 grade-separated crossings at Atherton Avenue, Walnut Avenue, Sacramento Street, Broadway, Mini Drive, Fairgrounds Drive, and Sage Street.

Bicyclists are permitted on the shoulders of SR 37 along the non-freeway section between Lakeville Highway and Wilson Avenue/Sacramento Avenue and on the expressway section of SR 37 between US 101 to SR 121; however, in general there are no designated bike lanes in the Study Area. One segment of bike lane is marked through the right-in right-out driveway intersection of SR 37 at Skaggs Island Road at Cullinan Ranch. Bicycle facilities include the SMART Trail, bike lanes on Atherton Avenue and Wilson Avenue, bike lanes on Sacramento Street, and the San Francisco Bay Trail.

Mobility

Traffic Operations

Traffic operations generally describes the flow (or volume) and speed of traffic. Available data from three locations—Petaluma River Bridge, Noble Road, and the Mare Island/Walnut Avenue/Railroad Avenue interchange—was used to develop speed and volume charts. See Appendix C, Chapter 20, Figures TR-5 through TR-10 that show the speed and flow by hour for a week in October 2019.

Traffic speed was affected at all three locations, due to peak period volumes, signal queuing, and lane reductions. At the Petaluma River Bridge, eastbound speeds dipped during the PM peak period on weekdays and on Saturday due to the lane drop at SR 121; the speed dropped to 30 mph during the midday period, likely from queuing at the Lakeville Road signal. At Mare Island, the westbound direction regularly has very slow speeds (less than ten mph) during the AM peak period due to the lane reduction just to the west, which does not affect eastbound traffic. However, at Noble Road, speeds reliably drop to 30–40 mph when volumes are high in both directions, with its capacity approximately 1,300 vehicles per hour in either direction. Signal

queuing at SR 121 reduces westbound speeds, but eastbound also shows low speeds even though no signal exists to the east, likely due to volume levels reaching capacity.

SR 37 is prone to closure from flooding, particularly at Novato Creek, Tubbs Island, and Mare Island, affecting travelers on SR 37 and local streets nearby. These closures result in lengthy detours on lower-capacity and circuitous parallel facilities including SR 116 and SR 12 near Sonoma and Napa to the north of SR 37, or I-580 and I-80 through San Rafael and Richmond to the south. Nearby local roadways are heavily congested during these closures.

Travel Time Reliability

Weekday travel time reliability was assessed using the traffic operations data at the same locations discussed above. During the week, eastbound travel is less reliable (slower) at Petaluma Bridge and Noble Road, while westbound travel at Mare Island is less reliable. At Noble Road, westbound travel is less reliable during the morning but can also be slow all day. Figures TR-11 through TR-16 in Appendix C, Chapter 20, show the speed distribution by direction and time of day at the three locations.

Vehicle Occupancy

Available data on HOV counts was conducted in 2019 on SR 37 at Noble Road, as part of the *State Route 37 Sears Point to Mare Island Improvement Project, Draft Environmental Impact Report/Environmental Assessment*. In the AM peak period, vehicles with two or more passengers accounted for approximately 19% of the total vehicles in the eastbound direction and 13% in the westbound direction. During that same period, single-occupant vehicles accounted for 71% of eastbound traffic and 82% of westbound traffic. The trend was similar in the PM peak period but higher for single-occupant vehicles at 80% in the eastbound direction. A site visit during the PM peak period in February 2022 revealed that most passenger vehicles in the corridor had five or more seats, a seat utilization generally less than 25%. Additional data from *Plan Bay Area 2050 Draft EIR* estimated the regional weekday average for persons per vehicles was approximately 1.26. This data indicates that barriers or constraints exist that prevent greater sharing of existing available seats.

Vehicle Miles Traveled

For purposes of this study, total VMT describes the amount of all passenger and commercial vehicle travel on specific portions of the transportation network within a physical boundary.

> … total VMT describes the amount of all passenger and commercial vehicle travel on specific portions of the transportation network within a physical boundary.

Overall travel decreased immediately following the start of the COVID-19 pandemic in March 2020, attributed to lockdowns, remote work, and various business and school restrictions. VMT trends during COVID-19 were determined using data from traffic data collection company StreetLight from 2019 (pre-

pandemic) to the latest available data through 2022. This data was used to estimate average weekday VMT each year for the SR 37 corridor and the adjacent four-county area (Marin, Sonoma, Napa, and Solano Counties). See Appendix C, Chapter 20, for details about the data presented in Table 4-1.

Table 4-1. Weekday VMT Estimates through COVID-19

Geography	StreetLight[a] Data (2019)	StreetLight Data (2020)	StreetLight Data (2021)	StreetLight Data (2022)
SR 37 Corridor	775,300	645,497	666,848	712,925
Marin, Sonoma, Napa, and Solano Counties	34,991,575	26,233,775	28,210,486	28,626,256

SR = State Route
VMT = vehicle miles traveled
[a] StreetLight is a traffic data collection company

VMT decreased approximately 17% on the SR 37 corridor, and about 25% in the adjacent four-county area in the initial year of COVID-19 (2020). Since then, VMT has continued to increase closer to pre-COVID conditions. The latest available data from February and March 2022 estimates VMT on the SR 37 corridor has increased back to 8% below pre-COVID levels, and the four-county area VMT has increased back to 18% below pre-COVID levels. The earlier months of 2022 still reflected some business and school restrictions due to fluctuating COVID variant levels; travel is expected to increase in subsequent months as more business operations return to normal.

Safety

Use of roadways, whether in a vehicle, bicycling, or walking, involves inherent risk of collisions that can lead to property damage, injuries, and fatalities. In the SR 37 corridor, safety is a topic of public concern as reported in the *State Route 37 Comprehensive Multimodal Corridor Plan*. Outreach collected more than 3,750 responses from a broad diversity of SR 37 users. Safety ranked second among their concerns and was specifically mentioned the locations shown in Figure 4-31. Crash density was highest near the SR 121 signalized intersection but is much lower in the section between Mare Island and SR 121, where a median barrier exists with very few intersections (Figure 4-32). Crashes tend to be concentrated near at-grade intersections. Figure 4-33 shows the mapped location of injury and fatal crashes between 2016 and 2020.

Figure 4-31. Safety Hotspots on the SR 37 Corridor

Figure 4-32. SR 37 Collision Heat Map (2016–2020)

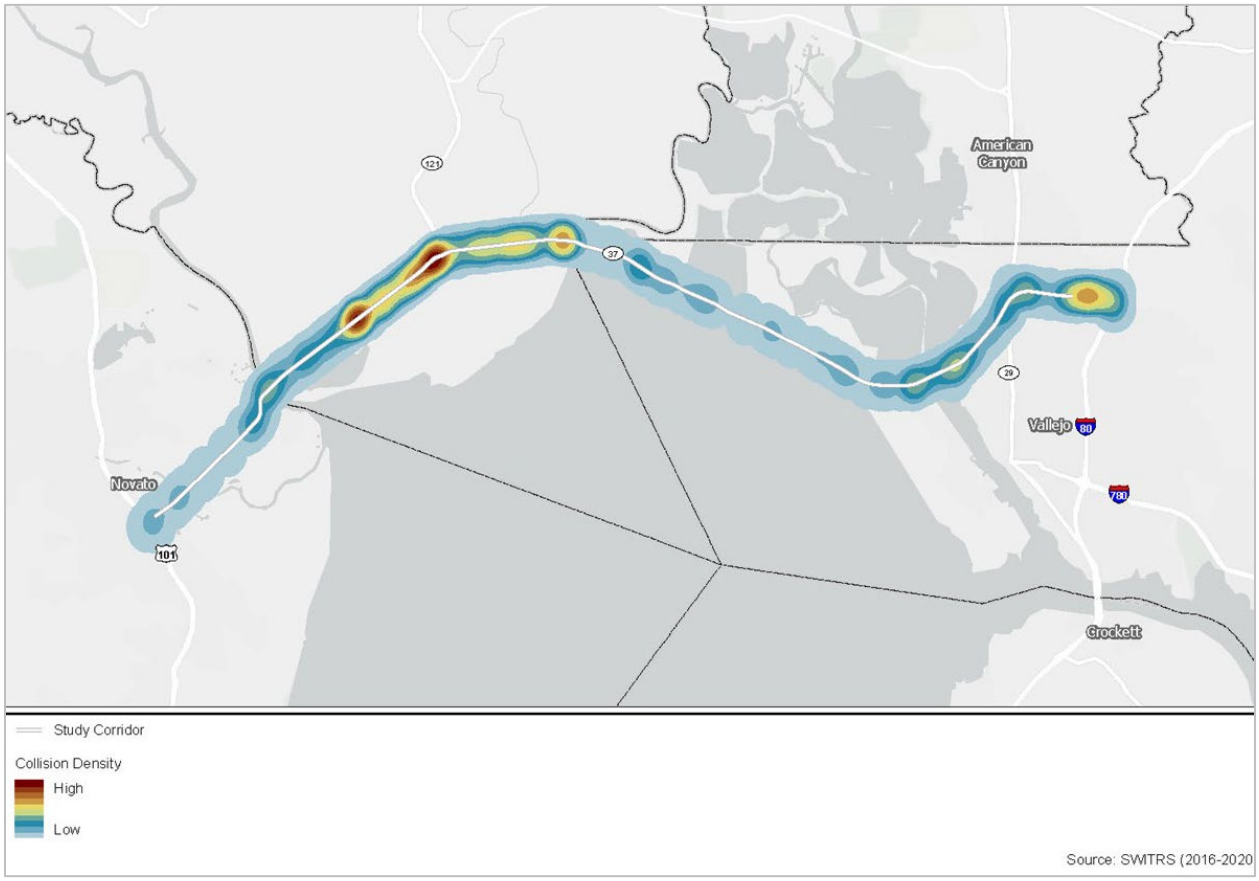
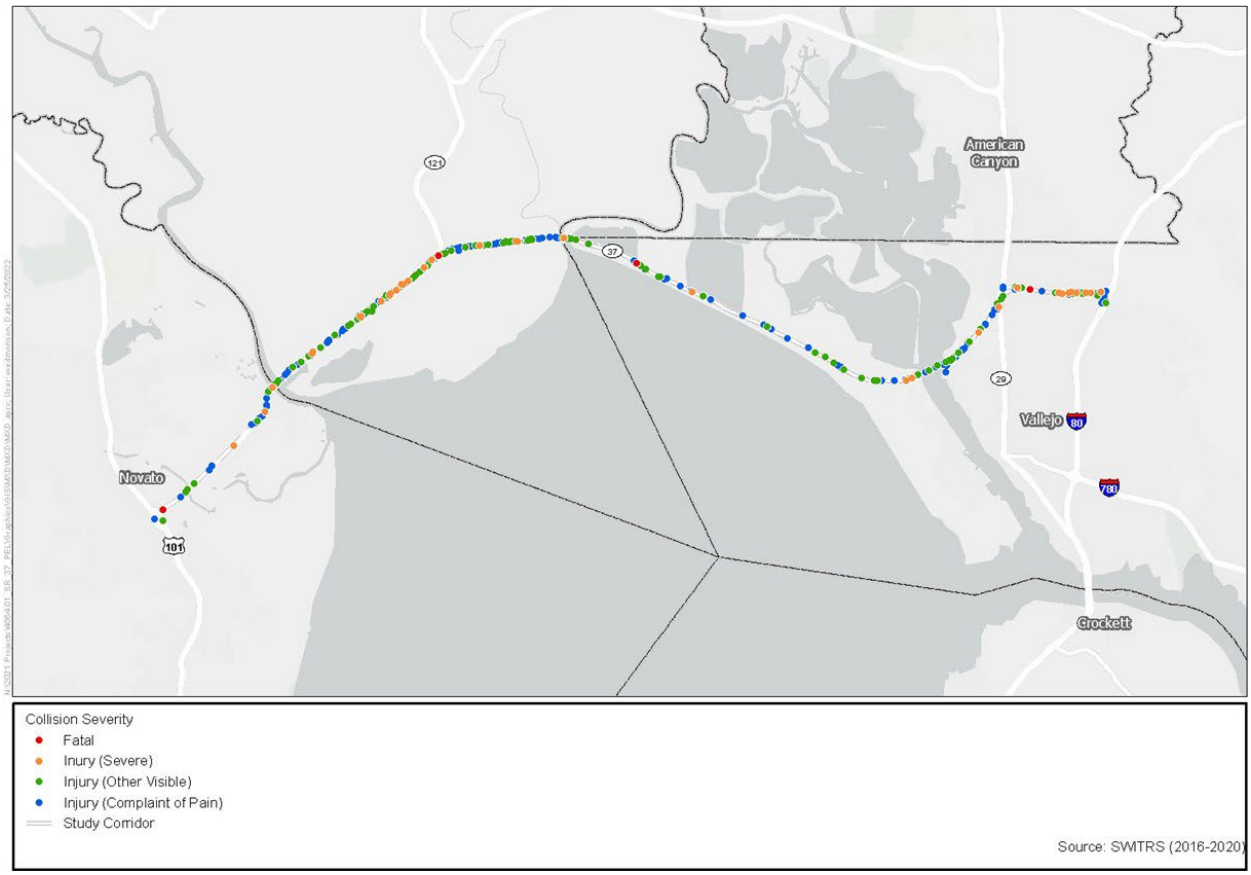


Figure 4-33. SR 37 Collision Severity (2016–2020)



Future Projects

Future projects will further consider how to balance the inherent tradeoffs associated with addressing existing transportation problems and accommodating future travel demand versus minimizing environmental impacts. Some metrics such as VMT will increase due to potential roadway capacity expansion. Induced VMT will result in higher fuel consumption and related emissions. Hence, the future alternatives will further consider this relationship in trying to balance competing objectives.

4.1.20 Equity

The analysis of conditions related to equity in the Study Area was based on the 2022 Caltrans Considering Equity in Community Impact Analysis for Projects guidance to environmental planners and generalists when conducting community impact assessments under CEQA and NEPA. The following resources were used in the analysis: CalEnviroScreen 4.0, Center for Neighborhood Technology Housing Transportation Affordability Index, MTC EPCs, EJScreen, local and regional plans, Caltrans Resilient SR 37 project website, Sonoma County Transportation Authority SR 37 project website, U.S. Census Bureau, and Walk Score® and Bike Score®.

Between 1980 and 2014, the Bay Area—where the Study Area is located—added more than two million residents. During that period, the percentage of people of color increased from 31% to 59%. People of color have driven much of the region's growth over the past three decades. Today, the nine-county region is the second most diverse of America's top 150 metropolitan areas.

The Bay Area is one of the wealthiest regions in the country; however, regional poverty rates and percentages of people employed in low-wage jobs have been consistently higher than the national averages. Moreover, this wealth is not distributed equitably along racial, ethnic, and gender lines. People of color are more likely than White people to be in poverty or among the working poor. Women of color earn significantly less than their counterparts at every level of educational attainment. High unemployment in urban and suburban areas is more prevalent in communities with high concentrations of people of color. For example, the North Bay's highest concentrations of unemployment are clustered in MTC EPCs[6] in Santa Rosa and East Vallejo.

The four counties that comprise the North Bay subregion are all represented in the Study Area, along with a specific focus on Vallejo due to the presence of several EPCs in this city as well as its centrality to the SR 37 project. Vallejo residents, including those who live in the city's 16 EPCs, are heavily dependent on the SR 37 corridor to reach jobs and services in Marin and Sonoma Counties and the San Francisco metropolitan area. Some of the residents of Solano County inland EPCs (e.g., Fairfield) as well as those in Napa and Sonoma Counties also rely on SR 37 to access western urban centers.

> Today, the nine-county Bay Area is the second most diverse of America's top 150 metropolitan areas.

There are marked differences in diversity levels between the western and eastern localities of the North Bay region (Figure 4-34). More than 80% of residents in Marin, Sonoma, and Napa Counties are White, including those of Hispanic or Latino origin. Compared to these three counties, Solano County has a smaller proportion of White residents (60%) and about twice as many people that identify as Black, Asian, or multiracial. The city of Vallejo houses about 28% of Solano County's population and is one of the most diverse cities in the North Bay (Figure 4-35).

The North Bay's patterns of wealth and employment characteristics are similar to those of racial and ethnic diversity. People experiencing poverty are more commonly found in Vallejo, as well as parts of Napa, Fairfield, Santa Rosa, Petaluma, and Dixon (Figure 4-36 compared to Figure 4-34). Across the board, income levels correlate directly to education and inversely to poverty rates. Marin County's percentage of college-educated residents (60%) is more than double the percentage in Vallejo (27%) and its poverty rate (6%) is half as high (12%). However, the numbers

[6] An EPC is defined in one of two ways: (1) a tract that exceeds concentration threshold values for percentages of households classified as low income and as people of color, or (2) a tract that exceeds the threshold value for low income and exceeds the threshold values for three or more other variables.

of persons in poverty are quite similar in the two communities. Marin County's population of persons in poverty (15,739) is slightly higher than that of Vallejo (15,131).

Data on the numbers of local employers in each county correlates to the predominant pattern of westbound morning commutes on SR 37. The western half of the North Bay subregion has more employers and higher wages than the eastern half. Sonoma County has by far the highest number of employers (14,242) and attracts the most workers (177,333). Marin County's average pay per employee ($74,903) is as much as $20,000 higher than that of employees in the other three localities. Given the high cost of housing in Marin County, workers in Marin County's many service jobs are likely to commute into the county on SR 37 from points east where housing is more affordable.

Future projects will seek opportunities to improve regional and local multimodal connectivity for lower-income residents and people of color.

Figure 4-34. North Bay Percent Non-White Population (2010)

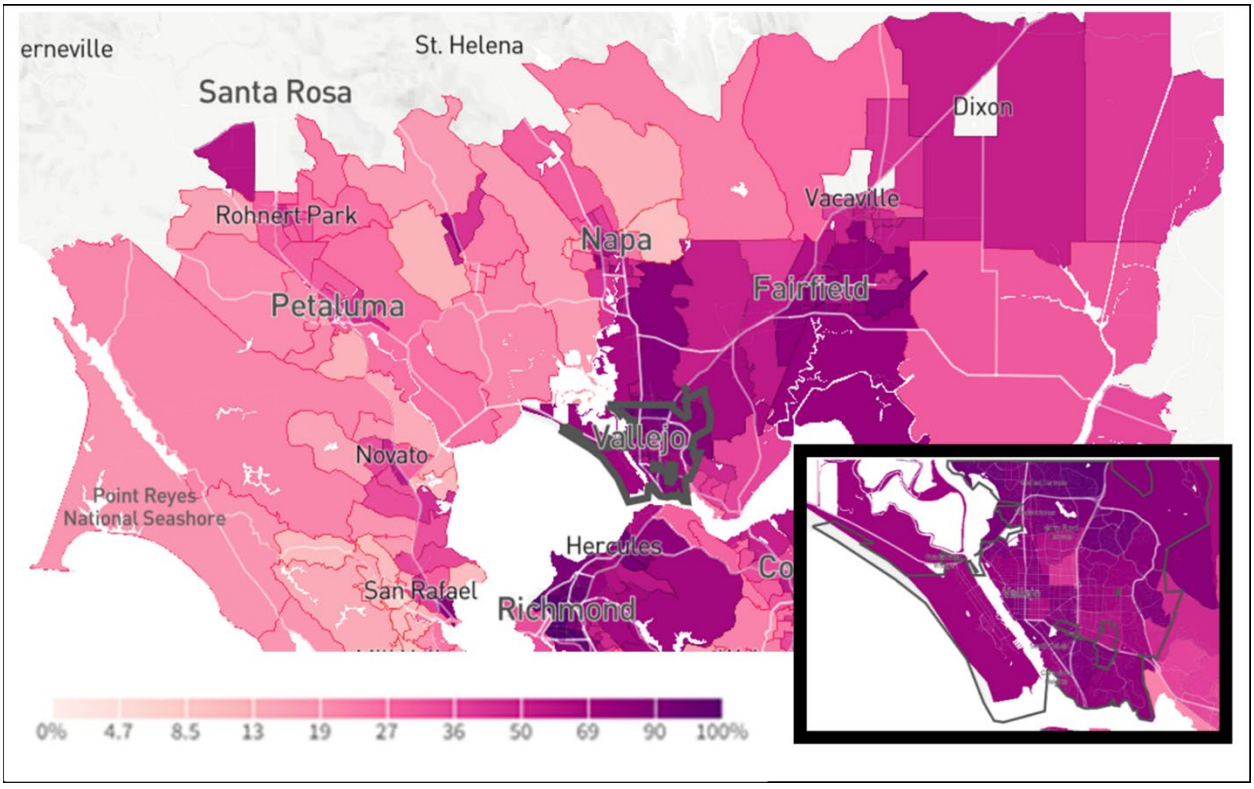


Figure 4-35. Ethnic Diversity in City of Vallejo Compared to Study Area Counties

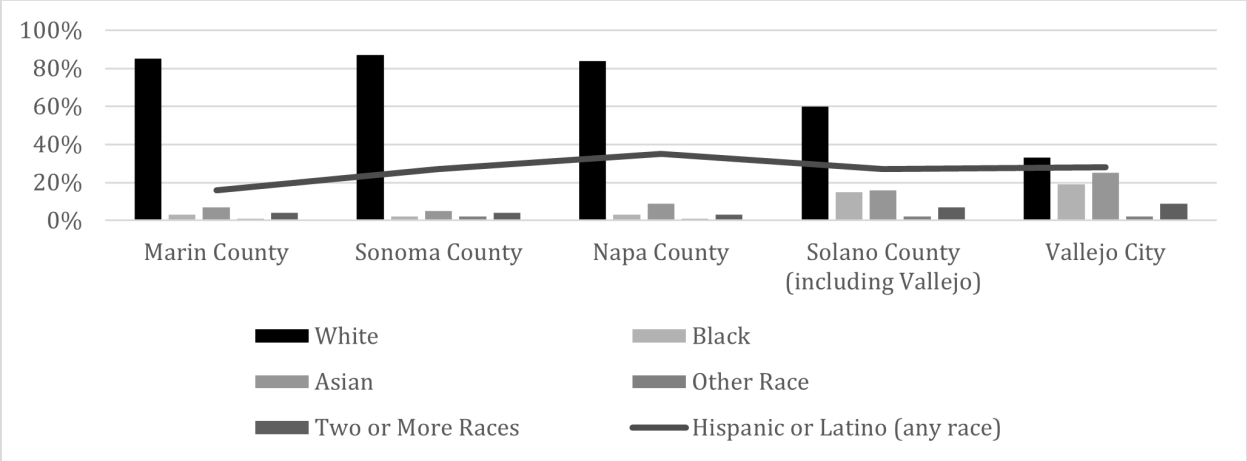
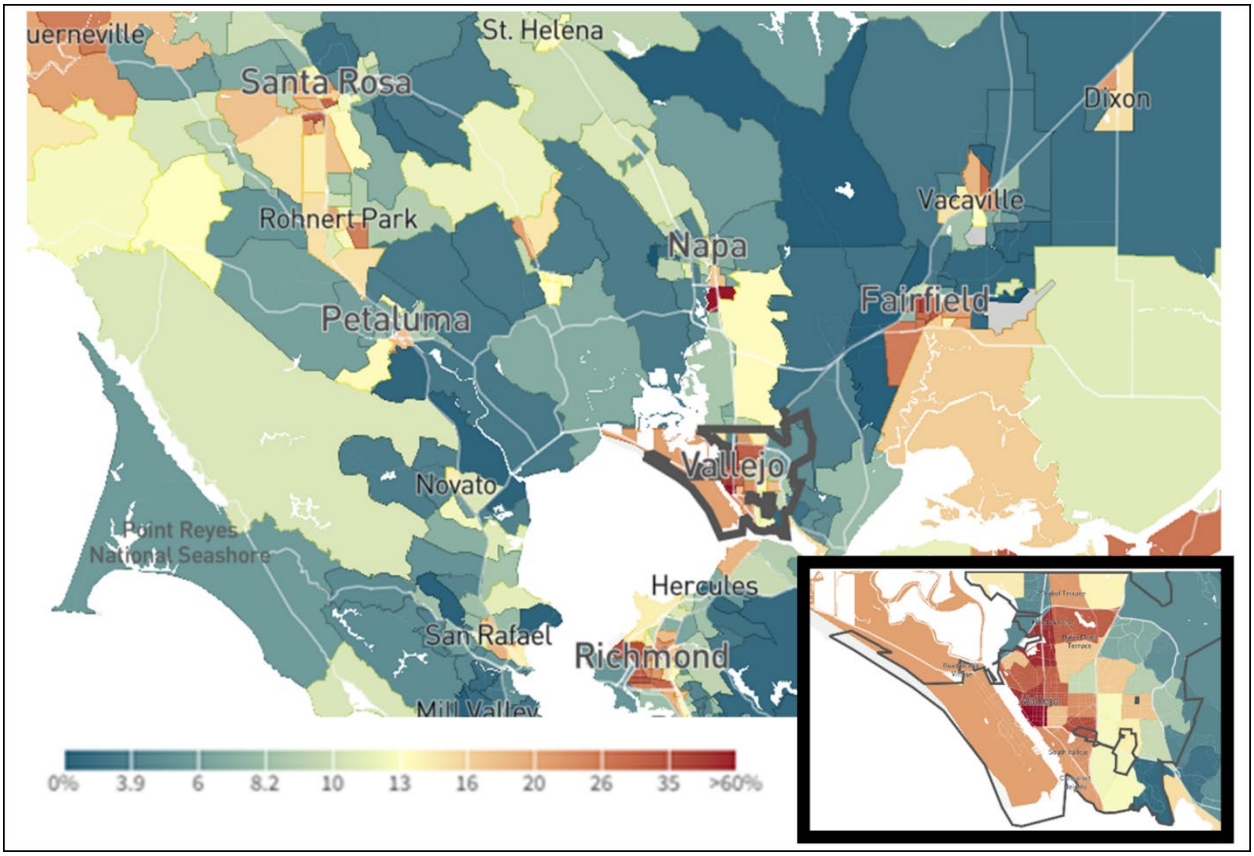


Figure 4-36. North Bay Area Poverty Rates 2012–2016



4.1.21 Visual Resources

The analysis of conditions related to visual resources in the Study Area was based on the review of local planning documents and publicly available information pertinent to visual resources.

The existing SR 37 project corridor travels mostly through rural, agricultural lands, and baylands bordering San Pablo Bay until it reaches Vallejo and travels through urbanized development. There are few visual obstructions along the highway, so expansive views of the surrounding landscape are available.

Developed portions of the corridor in Vallejo are well lit. However, lighting along rural portions of the corridor is mostly associated with major intersections and on- and off-ramps such as for Black Point, Sear Point (at SR 121), and the exit for Mare Island. The remainder of the corridor is mostly unlit. Although there are few lights along SR 37, resulting in lower lighting conditions at night, glare tends to be somewhat high during the day.

The existing SR 37 project corridor travels mostly through rural, agricultural lands and baylands bordering San Pablo Bay.

The Study Area consists of both developed and undeveloped areas, and viewer groups include recreational, residential, and business (i.e., retail, commercial, institutional, civic, industrial, and agricultural) and travelers on local roadways and passenger rail lines. Two overarching groups of viewers are affected by a project: neighbors and users.[7]

The San Pablo Bay NWR is located north and south of SR 37. The existing SR 37 traverses the southern area of the San Pablo Bay NWR. The Olompali State Historic Park is west of US 101, at the western terminus of Alignment 2.

Three state-owned wildlife areas are present in the Study Area:

- The Petaluma Marsh Wildlife Area is located north and south of SR 37.
- The San Pablo Bay Wildlife Area is located south of SR 37.
- The Napa-Sonoma Marshes Wildlife Area is located north and south of SR 37.

[7] *Neighbors* are those people who have views *of* a project feature because they are adjacent to it. *Users* are those people who are within project boundaries and have views *from* a project feature.

There are no officially designated State Scenic Highways within three miles of the Study Area. However, eligible State Scenic Highways are within three miles of the Study Area, and several segments of classified landscaped freeways also are present in the Study Area.[8]

The Study Area for visual resources includes County-designated scenic routes and other resources intended for protection for their scenic values by the Counties of Marin, Sonoma, Napa, and Solano. Similarly, the Study Area for visual resources includes City-designated scenic routes and other resources identified for protection for their scenic values by the Cities of Novato, Petaluma, American Canyon, and Vallejo. County and City parks and recreational features located in the Study Area are detailed in the Parks and Recreation section of Appendix C.

The Study Area also includes parks and recreational facilities operated by nonprofit organizations and other entities, such as the Mare Island Shoreline Heritage Preserve, San Francisco Bay Trail, and lands protected and restored under the San Francisco Bay Joint Venture, that provide views of areas that are high in visual quality and that offer nature and wildlife viewing opportunities. These facilities, too, are described in more detail in the Parks and Recreation section of Appendix C.

Future projects will consider how the proposed alignments expand into or intersect with protected visual resources, how proposed features (e.g., bridges, causeways) protect or damage scenic resources located along the alignments, how proposed features (e.g., bridges, causeways) create or obscure scenic vista views, how classified landscaped freeway segments are affected, if lighting design could introduce or reduce nuisance light and glare, and how project design can improve or degrade views of and from the project corridor. Future coordination with governing agencies and other bodies may be required.

4.2 RESOURCES NOT EVALUATED

Two resources, coastal zones and coastal areas, and wild and scenic rivers were not evaluated in the Existing Conditions Reports:

- There are no coastal zones regulated by the California Coastal Commission under the federal Coastal Zone Management Act or the California Coastal Act in the Study Area.
- None of the rivers in California designated under the National Wild and Scenic Rivers System are found in the Study Area.

However, the absence of both resources will be confirmed for any future projects programmed from the SR 37 PEL Study in a NEPA evaluation.

[8] Caltrans defines a classified landscaped freeway as "a section of freeway with ornamental vegetation planting that meets the criteria established by the California Code of Regulations (Cal. Code Regs.), Outdoor Advertising Regulations, Title 4, Division 6. This designation is used in the control and regulation of outdoor advertising displays."

CHAPTER 5

Alternatives Identification

Once the purpose and need statement for the SR 37 PEL Study was developed (Chapter 3, *Vision, Purpose, and Need*), the process of considering alternatives could proceed. The alternatives proposed by the PEL Study Team were intended to be a varied menu of solutions that would build on a common vision of purpose and need as well as an understanding informed by a review of existing environmental conditions (Chapter 4, *Existing Conditions*).

5.1 DEVELOPMENT OF ALTERNATIVES

In the years prior to the SR 37 PEL Study, Caltrans, MTC, the regional transportation agencies, and other organizations put forth many ideas for solutions to the congestion and threat of sea level rise along the SR 37 corridor. The PEL Study Team reviewed prior studies and reports and explored conceptual alignments and modal alternatives for portions of as well as the entire SR 37 corridor (US 101 to I-80). The nine studies and reports along with their major findings are provided in Table 5-1.

Using the information provided by the studies and reports listed in Table 5-1, the PEL Study Team identified commonalities between the alignments and conceptual alternatives. These common traits, in tandem with the aim to fulfill the finalized project purpose, helped inform the initial alignments proposed for consideration.

Table 5-1. SR 37 Corridor Studies Consulted

Study/Report Name	Lead Agency	Month/Year Published	Major Findings/Recommendations Relevant to SR 37 PEL Study
Transportation Concept Report	Caltrans District 4	January 2015	Identified conceptual alternatives for the entire SR 37 corridor, focusing on elevating the roadway between US 101 and Mare Island.
SR 37 Corridor Financial Opportunities Analysis Final Report	Project Finance Advisory Ltd., on behalf of SR 37 Project Leadership Team, Executive Steering, and Policy Committees (Transportation Authorities of Marin, Napa Valley, Solano, and Sonoma Counties)	November 2017	Examined the costs of prospective causeway and embankment options as well as the potential for tolling to create a revenue stream.
SR 37 Transportation and Sea Level Rise Corridor Improvement Plan	MTC-led consortium of regional agencies; Caltrans District 4	February 2018	Examined major concepts: accommodating, protecting, and retreating from expected sea level rise.
The Grand Bayway Design Roadmap	Common Ground (NGO)	May 2018	Considered several modal alternatives and recommended that the existing SR 37 be replaced by a scenic causeway elevated on columns 20 feet high as well as enhanced public access into natural area.
SR 37 Alternatives Assessment Report for the Ultimate Project	MTC	April 2019	Proposed five alternatives, including retreat alignments to north and causeway options along existing SR 37 corridor.
Passenger Rail Service Novato to Suisun City	SMART	May 2019	Examined feasibility of rail upgrades and improvements needed to enable SMART to institute passenger service along its owned railroad tracks to Suisun City (Capitol Corridor connection).
SR 37 Corridor Adaptation Study	Transportation Authority of Marin/Marin County	February 2020	Examined conceptual strategies to increase the resiliency of the SR 37 corridor between US 101 and the Petaluma River (Sonoma County line).
SR 37 Project Study Report-Project Development Support	Caltrans District 4	June 2021	Identified a mix of alternatives and conceptual alignment options both within and retreating from the SR 37 corridor.
SR 37 Design Alternatives Assessment	MTC	February 2022	Building on 2019 Alternatives Assessment Report, the Design Alternatives Assessment more closely examines prospective on- and off-corridor alternatives between US 101 and Mare Island.

MTC = Metropolitan Transportation Commission
SMART = Sonoma-Marin Area Rail Transit
SR = State Route
US = U.S. Highway

ALIGNMENTS AND ALTERNATIVES

In the planning context, the terms "alignment" and "alternative" are related but not interchangeable. For the purposes of this study, the PEL Study Team adopted the following definitions.

An *alignment* is a line on a map, which may or may not follow an existing transportation corridor. An alignment is one-dimensional, representing only the general route on the map; it does not include any consideration of roadway width, the composition of the roadway prism, the profile of the roadway (i.e., its relationship to the existing grade of the earth), or any other such details. When a buffer zone is added to the alignment to account for overall potential area of disturbance, it may be considered a *corridor*.

An *alternative* consists of an alignment, plus the following:

- Cross section (the width of the transportation corridor that includes all the lanes, shoulders, barriers, and pedestrian and bicycle facilities)
- Profile (e.g., causeway or bridge, embankment, retained fill, at grade)
- Connection points with adjoining roadways or access points (e.g., interchanges, intersections)

An alternative may also include other components, such as a rail corridor or dedicated bus lane, details on shoulder use (e.g., peak period use of shoulders), public access details, specific design details, and any project features that avoid or reduce environmental impacts.

Seven alignments were initially proposed and are described in Table 5-2.

Table 5-2. Seven Initial Alignments

Alignment	Description (West to East)
1	This alignment would follow the existing SR 37 corridor from US 101 to SR 121, then turn north along SR 121 for about 3 miles, then turn east on new roadway that would generally parallel SMART-owned railroad until reaching SR 29 in American Canyon.
2	This alignment would begin along US 101 north of the current SR 37 interchange and continue east onto a new 4.5-mile-long bridge that would cross over marshland, the Petaluma River, and agricultural fields before intersecting Lakeville Highway. The roadway would continue east at grade tracing an existing private road for 2.5 miles until reaching SR 121, where it would continue east on a new roadway paralleling SMART-owned railroad to meet SR 29 (similar to Alignment 1).
3	This alignment would begin along US 101 near San Antonio Creek and continue east onto a new 3.3-mile-long bridge that would cross over marshland, the Petaluma River, and agricultural fields before intersecting Lakeville Highway. The roadway would continue east at grade tracing an existing private road for 6.3 miles until reaching SR 121; from SR 121 it would follow the same route east as Alignments 1 and 2.
4	The alignment would begin at the US 101/SR 116 interchange in Petaluma and follow existing SR 116/Lakeville Highway eastward for 5.2 miles, passing Stage Gulch Road, and then from this point continue east along the same path as Alignments 1, 2, and 3.

Alignment	Description (West to East)
5	This alignment would follow the existing SR 37 but assumes the road would be reconstructed near the existing alignment on either an embankment fill, an elevated structure, or a combination of both (hybrid). Reconstruction would include bridge replacements and intersection/interchange modifications.
6	This alignment would also follow the existing SR 37 and utilize the existing roadway; the road would be protected in place by a new or enhanced levee system (with some floodgates). This alignment assumes the completion of other proposed corridor projects that would provide two general purpose lanes in each direction for the full length of the corridor.
7	This alignment would follow a new west-east elevated structure beginning at the US 101/SR 37 interchange in Marin County, continuing east over existing marshland and the San Pablo Bay and connecting directly to the Napa River Bridge west approach. A second, intersecting elevated structure would extend SR 121 from its current terminus near Sears Point about three miles south over land and water to connect via interchange over San Pablo Bay.

SMART = Sonoma-Marin Area Rail Transit
SR = State Route
US = U.S. Highway

5.1.1 Feedback on Alignments

Feedback provided by stakeholders engaged as part of the PEL process on the initial alignments was generally positive, and all the initial alignments were considered worthy of ongoing consideration. However, TWG members suggested adding an eighth alignment because all seven initial alignments were at least partially within an area where inundation by eight to ten feet of sea level rise was expected, as identified in forecasts prepared by BCDC and OPC. TWG members noted that the existing SR 116/SR 12 between Petaluma and SR 29 at Cordelia Junction would be outside the inundation area. Accordingly, they suggested the SR 116/SR 12 alignment be included as a northern retreat option not only because it was outside the expected inundation area and San Pablo Bay wetlands, but also because it was an existing transportation corridor, while Alignments 1, 2, 3, 4, and 7 would require new construction. The PEL Study Team welcomed this suggestion and added Alignment 8 for consideration, as shown on Figure 5-1 and described in Table 5-3.

Figure 5-1. Eight Initial Alignments

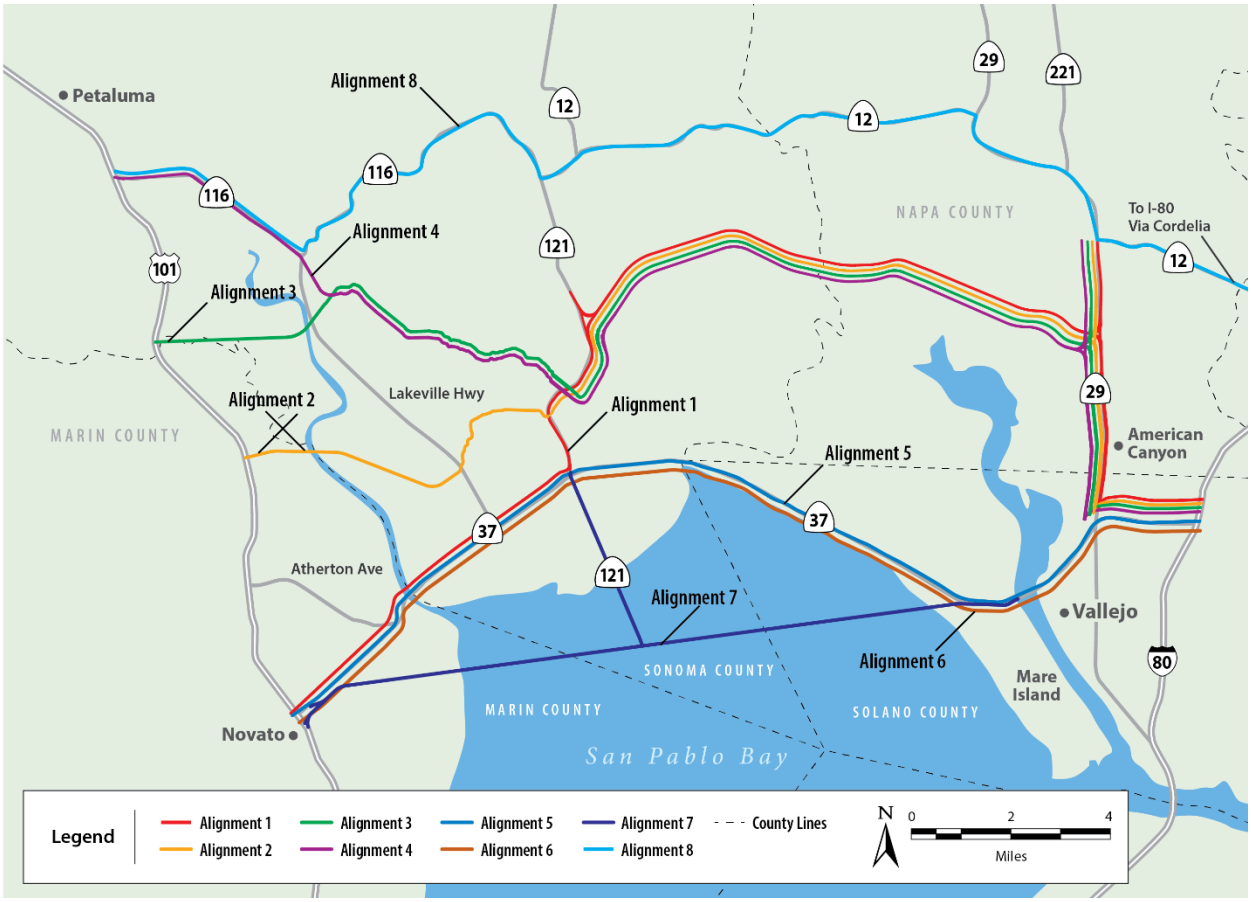


Table 5-3. Description of Alignment 8

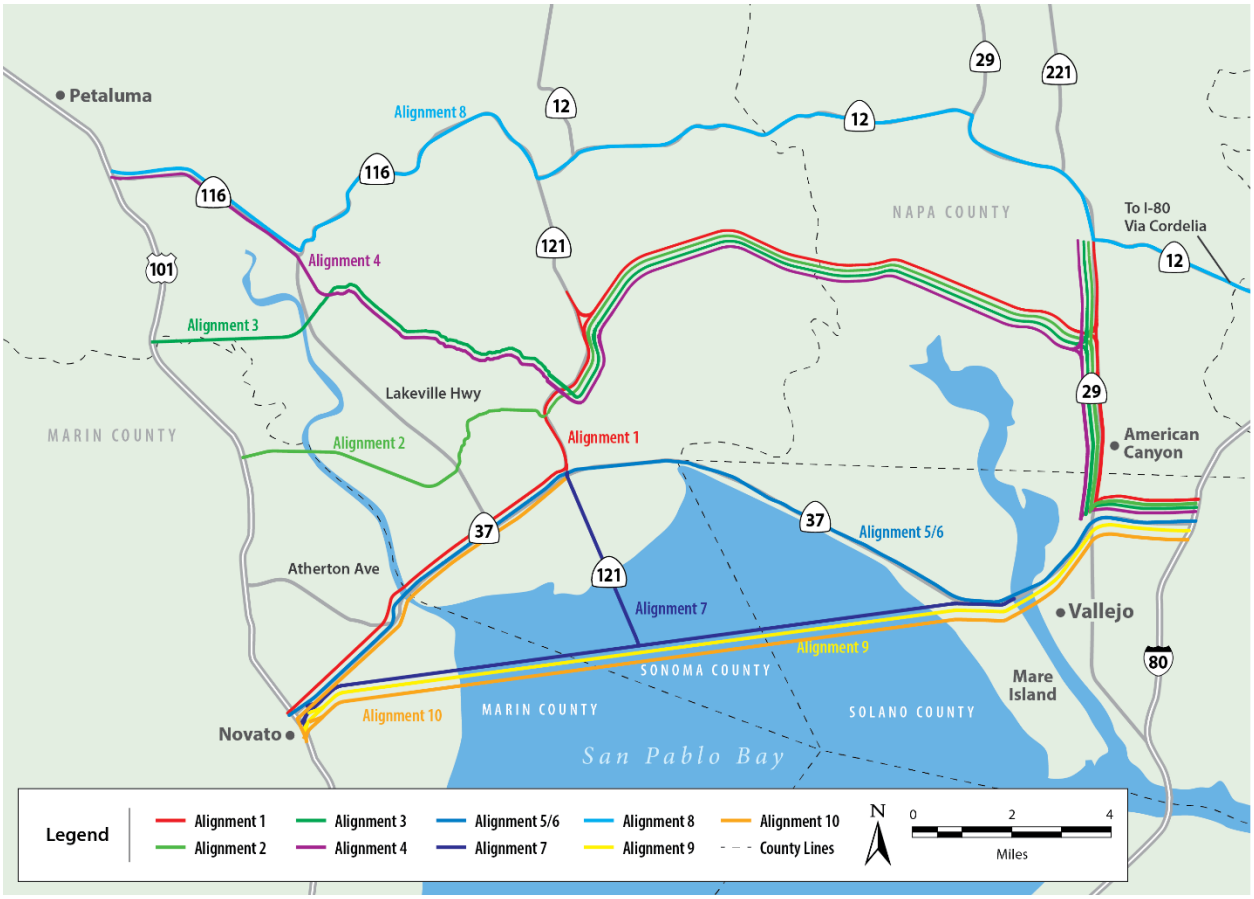
Alignment	Description (West to East)
8	From Petaluma, the alignment would use existing SR 116 east (Lakeville Highway/Stage Gulch Road/Arnold Drive); to Schellville on SR 121 east, and join SR 12 (Carneros Highway/Sonoma Highway) and continue east to I-80 at Cordelia Junction

I- = Interstate
SR = State Route

Following the finalization of eight initial alignments, the PEL Study Team, TWGs, and SWG conducted the Level 1 screening that focused on evaluating how well the alignments could fulfill the project purpose and need. The screening criteria are described in Chapter 6, *Alternatives Evaluation Criteria*, and the outcomes of the three-level screening process are described in Chapter 7, *Alternatives Screening and Identification of the Preferred Alternative*. As the screening process advanced to Level 2, the PEL Study Team developed Alternatives 9 and 10. Alternative 9 was developed to avoid an over water intersection at SR 121 that would be required by Alternative 7, and Alternative 10 was developed in response to feedback from the ESC. Because Alternatives 9 and 10 were variations on Alignment 7, which proposed an

overwater structure crossing the bay directly from Novato to Vallejo, they were considered to have cleared Level 1 screening. Figure 5-2 shows the final ten alignments that were evaluated.

Figure 5-2. Ten Proposed Alignments



Alignments that were found to meet the project purpose and need were carried forward and developed into alternatives at the outset of Level 2. Alternatives included specific proposals for the number and width of lanes, profile of the roadway (e.g., at grade, on embankment, on structure), potential peak hour shoulder use, possible bicycle and pedestrian facilities, and other functional details and options. Prior to the Level 2 screening, for the sake of simplicity and clarity, the PEL Study Team combined Alignments 5 and 6 into a single Alignment 5/6, as shown on Figure 5-2.

As Level 2 alternatives, Alternative 5 and Alternative 6 both follow the existing SR 37 alignment, but Alternative 5 is a causeway design option with limited embankment while Alternative 6 design is an option using levee systems. During Level 2 screening the TWG members indicated a preference for the causeway option because it would have substantially

> Eight alignments that potentially satisfied purpose and need were carried forward to be developed into alternatives.

fewer impacts on existing resources. Therefore, during Level 3 screening the PEL Study Team decided to rename Alternative 5/6 as Alternative 5 going forward.

5.2 MODAL MENU

As a result of feedback from stakeholder and public outreach efforts and to address the multimodal goals identified in the project purpose and need, the PEL Study Team developed potential modal choices (beyond conventional roads) that could be added to one or more of the various alignments as alternatives.

Identification of modal choices focused on the potential to increase person-throughput or to reduce VMT in the corridor. The modal menu with descriptions follows.

- **Floating Bridge.** Given the expectation of sea level rise in the area, the idea of a floating bridge was suggested that could potentially adapt to changing sea level.
- **Ferries.** Some TWG participants noted the existing ferry terminal in Vallejo and ferry use elsewhere in the Bay Area and suggested that ferries be considered a potential option.
- **Passenger Rail.** SMART currently operates along the US 101 corridor and also owns track that parallels SR 37 and SR 121 and that reaches Napa County. As part of its long-range planning, SMART has envisioned running passenger service along these tracks, extending tracks and service to Suisun City, where it could connect to existing Capitol Corridor (Amtrak) tracks.

Potential Passenger Rail

- **Auto Train.** With an eye towards a possible future in which regional travel habits could be quite different from those of the past century, a participant suggested a primarily rail-based solution across San Pablo Bay. Similar in concept to Amtrak's auto train service on the East Coast and similar services in Europe, drivers would drive their vehicles onto frequently running trains, that would cross San Pablo Bay, where drivers would exit and continue motoring to their destinations.
- **Bus.** While Caltrans is not a transit operator and no regular commute buses serve the SR 37 corridor, the PEL Study Team sought feedback on the inclusion of bus-preferential lanes (including bus rapid-transit-style bus-only lanes and preferential use of shoulders).
- **Tunnel**. Though acknowledged to be costly to construct, a tunnel option was suggested as a mode that is expected to be resilient in the event of sea level rise.
- **Tolling.** Tolling was considered an option because while not necessarily a modal choice, it would have the potential to decrease VMT in the corridor

The PEL Study Team acknowledged that the existing SR 37 corridor does not serve bicycle or pedestrian users and based on Caltrans Director's Policy 037, Complete Streets, new or substantially upgraded alignments would incorporate safe pedestrian and bicycle facilities, either as part of the corridor (barrier-protected bicycle lane) or as a near but off-corridor facility (Class 1 bicycle path). Given the distance between Novato and Vallejo, providing bicycle and pedestrian facilities would not substantially reduce automotive use, but would offer important recreational opportunities.

5.2.1 Stakeholder Feedback on Modal Menu

As described in Chapter 2, *Agency, Stakeholder, and Public Engagement*, Caltrans' vision for the SR 37 PEL Study was to foster a collaborative working environment by engaging both internal and external stakeholders. Therefore, in December 2021, the PEL Study Team engaged the Design, Environmental, and Traffic TWGs and the SWG to solicit their feedback on the initial alignments and modal choices to be evaluated as part of the SR 37 PEL Study.

Working group feedback on modal choices was more limited than for alignments. This feedback included an emphasis on finding alternatives to automobile travel and concern that tolling options could potentially disproportionately affect low-income people in the area who use SR 37 to reach employment. However, it was noted that different modal choices needed to be considered in formulation of alternatives, following Level 1 alignment screening. Engagement with the TWGs and SWG continued through all levels of screening.

5.3 EVALUATING ALTERNATIVES

The work done by the PEL Study Team to propose the different alignments and alternatives described in this chapter provides context for both the process of developing three levels of screening criteria as seen in Chapter 6, and for selection of the proposed final corridor plan, described in Chapter 7.

CHAPTER 6

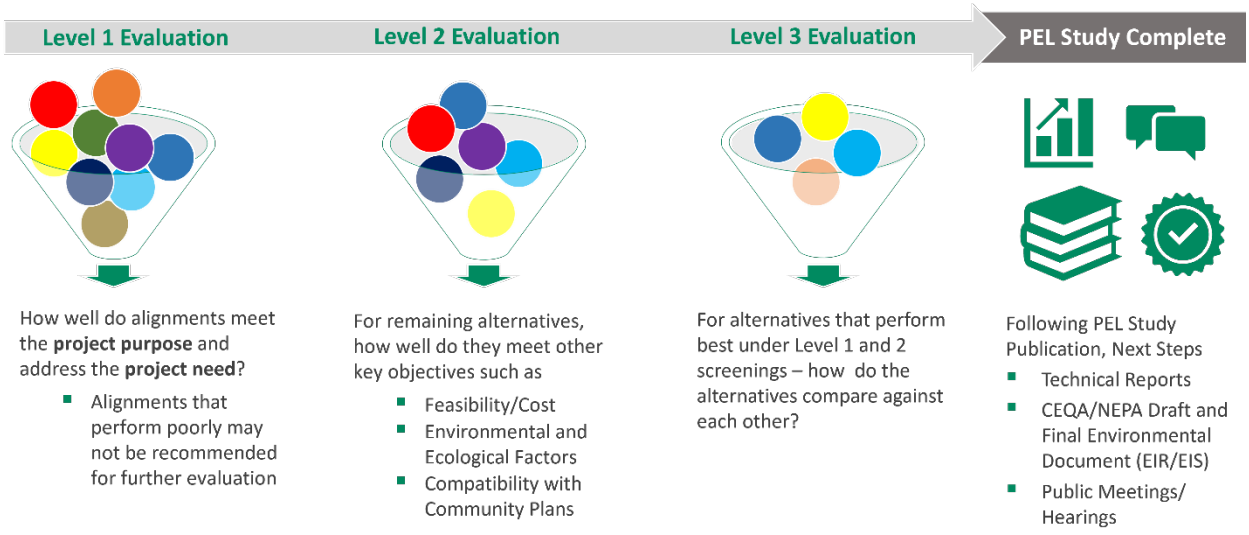
Alternatives Evaluation Criteria

To develop the alternative evaluation criteria, the PEL Study Team implemented a three-level process that solicited feedback from the SWG and TWGs to refine and finalize the alternative screening criteria.

6.1 DEVELOPMENT OF ALTERNATIVES

Each level of criteria centered around answering a central question. Level 1 criteria asked, "How well do alignments meet the project purpose and address the project need?" Level 2 criteria asked, "For the remaining alternatives how well do they meet key objectives related to design, environmental and ecological factors, and traffic and transportation?" Level 3 criteria asked, "For the remaining alternatives how well do they perform in comparison to each other?" Figure 6-1 illustrates the screening process. How the three levels of evaluation led to selection of a preferred alternative is described in Chapter 7, *Alternatives Screening and Identification of the Preferred Alternative*.

Figure 6-1. Alternatives Evaluation Criteria Process



6.2 LEVEL 1 EVALUATION CRITERIA FIRST DRAFT, NOVEMBER 2021

Level 1 criteria were developed to consider how closely the proposed alignments met the project purpose and need. To initiate this process, the PEL Study Team reviewed the SR 37 PEL Study Purpose Statement and used the five distinct components of the statement to draft factors to consider and prospective criteria.

These items were presented to the Design, Environmental, and Traffic TWGs in November 2021 and are summarized in Table 6-1. The working groups were asked to comment on how well the criteria represented the SR 37 PEL Study Purpose Statement and factors to consider in translating each component of the purpose statement into a measurable criterion. For specific input received from TWGs, refer to Appendix E, *Alternatives Evaluation Criteria Memorandum*.

Table 6-1. Draft Level 1 Criteria

Purpose Statement Component	Factors to Consider in Generating Evaluation Criteria	Draft Level 1 Criteria
Preserving a critical regional transportation corridor that is resilient to extreme events while integrating ecological resiliency, which facilitates adaptation to sea level rise.	Maintaining a vital transportation corridor in the North Bay	Does the alternative preserve connectivity between US 101 and I-80 corridors? Estimated travel time between key origin destination pairs? (e.g., Vallejo & Novato) Estimated vehicle miles traveled between key origin/destination pairs? Ability of alternative to serve as emergency evacuation route?
	Current likelihood of flooding in the corridor, which is expected to increase in frequency/ magnitude with sea level rise	Potential of the alternative to reduce exposure to projected levels of storm surge/flooding, up to and including 2130 projection of sea level under the Ocean Protection Council's 2018 Sea-Level Rise Guidance? Potential for the alternative to integrate ecological resilience to sensitive habitats of the North Bay and promote ecological connectivity improvements (such as Bay Area Critical Linkages concepts)? Ability of alternative to allow for future tidal and habitat transition zones?
Providing reliable travel time and promoting increases in average vehicle occupancy	Recurring congestion (traffic) Non-recurring congestion (e.g., crashes) Crash reduction Emergency detours/alternate routes around incidents	Ability of alternative to serve/accommodate anticipated travel demand (2050)? Potential for alternative to improve travel time reliability compared to baseline conditions? Ability of alternative to support/incorporate new multimodal and transit options (increase travel choices in corridor)? Ability of alternative to provide preferential treatment of high-occupancy vehicle and transit options (e.g., High-Occupancy Toll lanes)?
Provides safe mobility for bicyclists and pedestrians	Opportunities to expand recreational use Opportunities to expand commuter use of bicycle mode	Potential for alternative to provide dedicated or separated bicycle and pedestrian paths within the SR 37 corridor? Ability of any bicycle/pedestrian paths to connect with destinations/points of interest along the corridor?
Maintaining and enhancing public access, including to recreational areas	Properties accessed from existing SR 37 Opportunities for enhanced public access	Ability of alternative to maintain existing automobile access to private property? Ability of alternative to enhance access to recreational areas by automobile? Other modes?

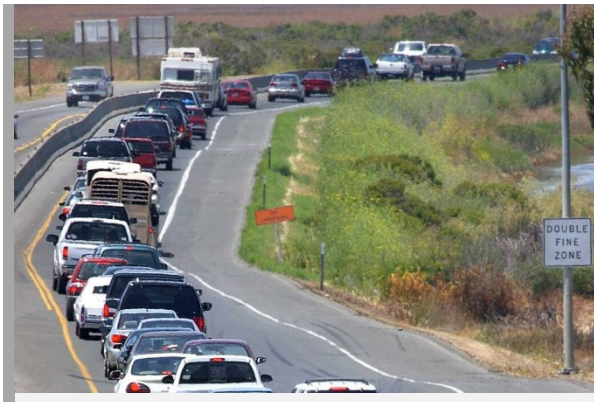
Purpose Statement Component	Factors to Consider in Generating Evaluation Criteria	Draft Level 1 Criteria
Providing equitable multimodal transportation solutions that improves access for, and provides meaningful benefits to all users of SR 37, with special consideration of underserved communities	Modes utilized for movement of people and goods Existing environmental and transportation challenges faced by historically disadvantaged communities Communities that are well served and underserved by transportation infrastructure	Potential for alternative to accommodate physical transit infrastructure or transit service improvements? Ability of alternative to enhance regional access for underserved communities? Potential for alternative to reduce adverse environmental conditions affecting disadvantaged communities? Potential for alternative to increase shift from single-occupancy vehicle to transit modes? Potential for alternative to reduce diversions to local roads relative to existing?

I- = Interstate
SR = State Route
US = U.S. Highway

6.2.1 Refined Level 1 Evaluation Criteria, December 2021

The PEL Study Team compiled and reviewed the input received from the working groups and made minor refinements to the draft Level 1 evaluation criteria. The PEL Study Team then reconvened the TWGs in December 2021 to present to them the following refined criteria:

- Does the alternative preserve connectivity between US 101 and I-80 corridors? Does it maintain current connection points? Or establish one or more new ones?
- Estimated travel time reliability (relative to future no project) by mode between key origin-destination pairs?
- Potential of the alternative to reduce exposure to projected levels of storm surge/flooding, up to/including year 2130 projection of sea level from the OPC Guidance?
- Ability for alternative to integrate the seven principles of the landscape resilience framework?
- Ability of alternative to change directionality during emergency events and/or use shoulders as emergency auxiliary lanes?
- Ability of alternative to serve/accommodate anticipated travel demand (2050)?
- Ability of alternative to support/incorporate/accommodate multimodal options in the corridor (aside from pedestrian/bicycle facilities) that would increase vehicle occupancy?
- Ability of alternative to enhance regional access for all communities?



Traffic congestion is forecasted to increase to a level that will escalate user delay, degrade air quality, and increase the collision rate within the corridor.

The PEL Study Team solicited further feedback on these refined criteria from the TWGs. Refer to Appendix E for more detail on TWG feedback.

6.2.2 Final Level 1 Evaluation Criteria, January 2022

After two rounds of review and refinement, the PEL Study Team crafted the following final Level 1 evaluation criteria in January 2022:

- Does the alignment preserve connectivity between existing interchanges on US 101 and I-80? Or would new interchanges be required?
- Would the alignment preserve existing and projected travel patterns for key origin and destination pairs that currently use the SR 37 corridor?
- Could the alignment improve corridor travel time reliability for HOVs relative to baseline conditions?
- Does the alignment reduce the exposure of transportation infrastructure to projected sea level rise as stated in the OPC Guidance—a rise of 8.6 to ten feet by 2130?
- Does the alignment integrate ecological resilience which facilitates adaptation to sea level rise? If so, how well?
- Could the alignment balance VMT regional goals against projected travel demand?[9]
- Could the alignment prioritize other transportation modes that would increase person-throughput, including commuter bus and rail?
- Could the alignment provide safe pedestrian and bicycle facilities?
- Does the alignment provide equitable transit and multimodal transportation solutions?
- Does the alignment maintain and enhance public access, including to recreational areas?

6.3 LEVEL 2 EVALUATION CRITERIA, DECEMBER 2021

In tandem with finalization of Level 1 criteria, the PEL Study Team engaged the TWGs in considering how well the proposed alternatives could meet important factors related to design, the environment, traffic, and feasibility. The PEL Study Team developed and presented draft Level 2 criteria to the TWGs in December 2021 concurrent with the refined Level 1 criteria. Table 6-2 summarizes the draft Level 2 criteria and the relationship of each (if any) with Level 1 criteria.

[9] The PEL Study Team noted that estimation of VMT would take place in a subsequent level of evaluation. Refer to Chapter 7, which documents that both Level 2 and Level 3 evaluations included consideration of VMT, as calculated by two different methods.

Table 6-2. Draft Level 2 and Related Level 1 Criteria

Purpose	Final Level 1 Criteria	Draft Level 2 Criteria
Preserving a critical regional transportation corridor that is resilient to extreme events while integrating ecological resiliency which facilitates adaptation to sea level rise	Does the alignment preserve connectivity between existing interchanges on US 101 and I-80? Or would new interchanges be required?	None
	Would the alignment preserve existing and projected travel patterns for key origin and destination pairs that currently use the SR 37 corridor?	Potential for alternative to generally reduce diversions to local roads relative to future no project conditions? Potential to reduce specific diversions to roads including but not limited to Lakeville Highway, Atherton Avenue, SR 12, SR 116, and SR 121; others?
	Does the alignment reduce the exposure of transportation infrastructure to projected sea level rise as stated in the OPC Guidance—a rise of 8.6 to 10 feet by 2130?	Potential for alternative to adapt if changing conditions warrant?
	Does the alignment integrate ecological resilience which facilitates adaptation to sea level rise? If so, how well?	Ability of alternative to integrate natural or nature-based features into the project, such as wetland restoration, hydrological connectivity, and landscape resiliency features.
	Could the alignment balance VMT regional goals against projected travel demand?	Estimated degree of change in VMT between key origin/destination pairs?
Providing reliable travel time and promoting increases in average vehicle occupancy	Could the alignment improve corridor travel time reliability for high-occupancy vehicles relative to baseline conditions?	None
Provides safe mobility for bicyclists and pedestrians	Could the alignment provide safe pedestrian and bicycle facilities?	None
Maintaining and enhancing public access, including to recreational areas	Does the alignment maintain and enhance public access, including to recreational areas?	None
Providing equitable multimodal transportation solutions that improves access for, and provides meaningful benefits to all users of SR 37, with special consideration of underserved communities	Could the alignment prioritize other transportation modes that would increase person-throughput, including commuter bus and rail?	None
	Does the alignment provide equitable transit and multimodal transportation solutions?	Ability of alternative to enhance regional access for specific underserved/disadvantaged communities? Which communities?

Purpose	Final Level 1 Criteria	Draft Level 2 Criteria
N/A	N/A	Estimated compatibility of alternative with existing conservation easements? Estimated land conversion to transportation use? Potential for existing transportation to be converted to non-transportation use? Potential for conflicts with adopted land use plans/policies? Estimated capital cost of alternative? Estimated maintenance cost of alternative? Estimated construction duration? (Number of months of heavy equipment use, truck traffic, etc.)

SR = State Route
OPC = Ocean Protection Council
VMT = vehicle miles traveled

6.3.1 Refined Level 2 Evaluation Criteria, March 2022

On receiving and reviewing input from the TWGs, the PEL Study Team refined the draft Level 2 evaluation criteria. The PEL Study Team presented the following refined Level 2 criteria to the TWGs in March 2022:

LEVEL 2 EVALUATION CRITERIA

- Design
- Environmental
- Traffic

Design

- To what extent does the alternative utilize existing infrastructure and ROW?
- To what extent does the alternative maintain existing connections to local routes currently served by SR 37?
- Would the alternative increase or decrease mileage over existing SR 37 for key origin and destination pairs?
- Would the alternative's proposed lane configuration prioritize transportation modes that would increase person throughput?
- Would the alternative encourage active transportation use, considering factors such as perceived safety, connections to recreational destinations, and similar features?
- Does the alternative include HOV, managed lanes, or transit services?
- Does the alternative serve any of the identified EPCs?
- Which properties would maintain their existing access along the current SR 37 alignment?
- Which properties would lose their existing access along the current SR 37 alignment?
- Which areas, including recreational areas, would have enhanced access?

Environmental

- Does the alternative require construction in future habitat transition and migration zones?
- Does the alignment allow for landward marsh migration?
- What opportunities/constraints does the alternative offer as infrastructure and landscape interaction are redesigned?
- Does the alternative promote space for habitat ranges to shift? Does the alternative provide adequate buffers for habitat zones? Are migration corridors and connectivity to upland habitats maintained by the alternative?

Potential to Implement Nature-based Solutions

Traffic

- What changes in travel patterns are expected from the alternative?
- How much improvement in travel time reliability could result from each alternative relative to baseline conditions?
- Would the alternative increase or decrease VMT in 2050 relative to future baseline conditions?

6.3.2 Final Level 2 Evaluation Criteria, May 2022

The PEL Study Team finalized Level 2 criteria after a second round of TWG feedback, organizing the criteria by categories of design, environment, and traffic. As further summarized in Appendix E, the PEL Study Team showed TWGs the initial draft criteria, a summary of TWG feedback, a summary of PEL Study Team considerations on that feedback, the finalized criteria, and information on how each criterion would be measured.

Design

- To what extent does the alternative utilize existing infrastructure and ROW?
- To what extent does the alternative maintain existing connections to local routes currently served by SR 37?
- Would the alternative's proposed lane configuration prioritize transportation modes that would increase person throughput?
- How would the alternative promote active transportation use, considering factors such as perceived safety, connections to recreational destinations, and similar features?
- How well does the alternative connect with existing or planned multimodal facilities that provide access to EPC?

- How would the alternative change existing access to parcels that currently utilize SR 37?

Environment

- How well does the alternative allow for future habitat transitions?
- How well does the alternative allow for landward marsh migration?
- How well are migration corridors and connectivity to upland habitats maintained by the alternative?
- How well does the alternative allow for incorporation of nature-based solutions, to advance both the protection of infrastructure as well as ecological resiliency?

Traffic

- What changes in travel patterns are expected from the alternative?
- How would the alternative change VMT in 2050 relative to baseline conditions? If the alternative would increase VMT, could the increase be feasibly mitigated?

6.4 LEVEL 3 EVALUATION CRITERIA, JUNE 2022

As part of the development of the Level 3 criteria, the PEL Study Team continued to focus on important factors related to the environment, traffic, and feasibility but with a particular emphasis on tradeoffs between the benefits and impacts of each alternative. Design criteria were influential in shaping alternatives that were developed during the Level 2 evaluation. During the Level 3 evaluation, however, the focus moved from design criteria towards an evaluation of performance-related criteria (environment, traffic, feasibility). Design considerations are related to feasibility criteria but were not explicitly evaluated during the Level 3 evaluation.

The PEL Study Team presented draft Level 3 criteria to the TWGs in June 2022 and the TWGs were asked to comment on both pros and cons of the criteria. The specific input received from the TWGs can be found in Appendix D of the PEL Study Team's June 2022 presentations, and can be found in Appendix B, *State Route 37 Corridor Planning and Environmental Linkages Study Agency, Stakeholder, and Public Outreach and Participation*, of this report. The draft Level 3 criteria are:

Environmental

- What are the impacts to tidal marsh?
- What are the impacts to tidal zone transition areas?
- What are the disruptions to existing migration corridors and essential ecological connectivity areas for both terrestrial and aquatic species?
- How does the alternative allow for ecological landscape resiliency based on the seven principles of landscape resilience?

- Does the alternative offer opportunities/constraints as infrastructure and landscape interaction are redesigned?
- Does the alternative allow for restoration and management of open space areas where native ecological communities can feasibly be restored?
- Does the alternative allow for landward marsh migration?
- Does the alternative allow for the transport of water and sediment where needed to maintain critical tidal habitats?
- Does the alternative minimize development of floodplains and flood-prone areas below the anticipated new mean higher-high water elevation?
- Does the alternative promote space for habitat ranges to shift?
- Does the alternative reduce infrastructure risk from sea level rise inundation and riverine flooding?
- Are migration corridors and connectivity to and within upland habitats maintained by the alternative?
- Does the alternative minimize impacts on threatened, endangered, and sensitive species and their critical habitat(s)?
- Does the alternative include impact buffer areas around tidal and riverine floodplains?
- Does the alternative allow for interpretation and interaction with nature?

Temporary Floodwall, 2019

- Can coordination and partnerships be fostered to support long-term planning to aid in adaptation and resiliency for the SR 37 corridor?
- Can roadway stormwater treatment be accommodated within the alternative corridor? Can passive treatment techniques be utilized? If not, will active treatment or frequent maintenance best management practices (BMPs) be required (i.e., drop inlet filter bags)?
- How many acres of Important Farmland would each alternative convert to transportation use?
- What are the possible impacts on cultural resources (built environment, archaeological, and Tribal cultural resources)?
- How many acres of native vegetation would be converted to a transportation use?
- What are the impacts on wetlands by this alternative?
- How many acres of critical habitat would be converted to a transportation use? How many federally listed threatened or endangered species and state-listed species would potentially be affected?

- How many acres of high-priority bird habitat would be converted to a transportation use? What are the impacts on migratory bird species?
- How many parcels and acres of land would be converted from a non-transportation use to a transportation use?
- Would the alternative have the potential to result in the indirect conversion of any land uses?
- Would the alternative be expected to have particularly acute construction period noise/vibration effects, such as pile driving, in areas with sensitive receptors (including wildlife)?
- Would the alternative be likely to result in operational noise/vibration impacts on people and/or wildlife?
- From a noise/vibration perspective, would the alternative be attractive to pedestrian/bicycle users?
- What benefits and/or disadvantages would the alternative have to any EPCs in the Study Area?
- To what if any extent would the alternative foster development of Plan Bay Area's PDAs?
- Would alternatives impact any Section 4(f) resources, including publicly owned parks, open space areas, and wildlife/waterfowl refuges?
- How many linear feet of the alternative would be in areas highly susceptible to liquefaction? To landslides? Within designated Alquist-Priolo earthquake fault zones?
- How many contaminated sites might be encountered during construction of the alternative?
- Would construction and/or operation of the alternative be likely to result in a visual intrusion or an adverse change in visual character?

Traffic

- How much would each alternative increase short-term regional VMT relative to future baseline/future no project conditions?
- How much improvement in travel time reliability would result from each alternative relative to baseline conditions?
- Would any other adjoining roads/routes see substantial changes in traffic patterns?
- Would the alternative be compatible with planned rail improvements?
- How likely would the alternative be to have unplanned/emergency closures due to wildfire? Flooding?
- Could the alternative provide access to recreational sites in the area, including public parks and preserves as well as privately owned facilities?

Feasibility

- What construction challenges would the alternative present that would influence its feasibility?
- Estimated construction costs
- Estimated maintenance costs
- Life cycle cost: What is the estimated cumulative life cycle cost of each alternative?

6.4.2 Final Level 3 Evaluation Criteria, June 2022

Similar to the finalization of Level 2 criteria and as summarized in Appendix E, the PEL Study Team showed TWGs the initial draft criteria, a summary of TWG feedback, a summary of PEL Study Team considerations on that feedback, the finalized criteria, and information on how each criterion would be measured. The PEL Study Team made minor changes to the draft Level 3 criteria based upon feedback from the TWGs. The changes included the following refinements:

- The criteria regarding unplanned and emergencies related to wildfires were split into two separate questions.
  - How likely would the alternative be to have unplanned/emergency closures due to wildfire?
  - How likely would the alternative be to have unplanned/emergency closures due to flooding?
- Feasibility-related criteria were carried over from the final Level 2 criteria into the Level 3 criteria because the engineering information was not available at the time the Level 2 screening was conducted.
- Criteria associated with maintenance and construction costs were removed because the available information for the preliminary level of alternatives designs would not result in accurate cost estimates.

43 FINAL LEVEL 3 EVALUATION CRITERIA

- Environmental
- Traffic
- Feasibility

The following are the final Level 3 criteria:

Environmental

- What are the impacts to tidal marsh?
- What are the impacts to tidal zone transition areas?
- What are the disruptions to existing migration corridors and essential ecological connectivity areas for both terrestrial and aquatic species?
- How does the alternative allow for ecological landscape resiliency based on the seven principles of landscape resilience?

- Does the alternative offer opportunities/constraints as infrastructure and landscape interaction are redesigned?
- Does the alternative allow for restoration and management of open space areas where native ecological communities can feasibly be restored?
- Does the alternative allow for landward marsh migration?
- Does the alignment allow for the transport of water and sediment where needed to maintain critical tidal habitats?
- Does the alternative minimize development of floodplains and flood-prone areas below the anticipated new mean higher-high water elevation?
- Does the alternative promote space for habitat ranges to shift?
- Does the alternative reduce infrastructure risk from sea level rise inundation and riverine flooding?
- Are migration corridors and connectivity to and within upland habitats maintained by the alternative?
- Does the alternative minimize impacts to threatened, endangered, and sensitive species and their critical habitat(s)?
- Does the alternative impact buffer areas around tidal and riverine floodplains?
- Does the alternative allow for interpretation and interaction with nature?
- Can coordination and partnerships be fostered to support long-term planning to aid in adaptation and resiliency for the SR 37 corridor?
- Can roadway stormwater treatment be accommodated within the alternative corridor? Can passive treatment techniques be utilized? If not, will active treatment or frequent maintenance BMPs be required (i.e., drop inlet filter bags)?
- How many acres of Important Farmland would each alternative convert to transportation use?
- What are the possible impacts to cultural resources (built environment, archaeological, and Tribal cultural resources)?
- How many acres of native vegetation would be converted to a transportation use?
- What are the impacts to wetlands by this alternative?
- How many acres of critical habitat would be converted to a transportation use? How many federally listed threatened or endangered species and state-listed species would potentially be affected?
- How many acres of high priority bird habitat would be converted to a transportation use? What are the impacts to migratory bird species?
- How many parcels and acres of land would be converted from a non-transportation use to a transportation use?

- Would the alternative have the potential to result in the indirect conversion of any land uses?
- Would the alternative be expected to have particularly acute construction period noise/vibration effects, such as pile driving, in areas with sensitive receptors (including wildlife)?
- Would the alternative be likely to result in operational noise/vibration impacts on people and/or wildlife?
- From a noise/vibration perspective, would the alternative be attractive to pedestrian/bicycle users?
- What benefits and/or disadvantages would the alternative have to any EPCs in the Study Area?
- To what if any extent would the alternative foster development of Plan Bay Area's PDAs?
- Would alternatives impact any Section 4(f) resources, including publicly owned parks, open space areas, and wildlife/waterfowl refuges?
- How many linear feet of the alternative would be in areas highly susceptible to liquefaction? To landslides? Within designated Alquist-Priolo earthquake fault zones?
- How many contaminated sites might be encountered during construction of the alternative?
- Would construction and/or operation of the alternative be likely to result in a visual intrusion or an adverse change in visual character?

Public Amenities Along the Corridor

Traffic

- How much would each alternative increase short-term regional VMT relative to future baseline/future no project conditions?
- How much improvement in travel time reliability would result from each alternative relative to baseline conditions?
- Would any other adjoining roads/routes see substantial changes in traffic patterns?
- Would the alternative be compatible with planned rail improvements?
- How likely would the alternative be to have unplanned/ emergency closures due to wildfire?
- How likely would the alternative be to have unplanned/emergency closures due to flooding?
- Could the alternative provide access to recreational sites in the area, including public parks and preserves as well as privately owned facilities?

Feasibility

- What are the estimated cut/fill quantities (or a similar metric)?
- What is the estimated feasibility of the alternative incorporating onsite stormwater treatment features/facilities?

This final level of screening was intended to identify the alternative that would best fulfill the long-term vision for the SR 37 corridor that had been collaboratively developed and refined by Caltrans, partners, and stakeholders over the course of the SR 37 PEL Study. Chapter 7 describes the preferred alternative and the rationale for selecting it.

PEL STUDY PURPOSE

For each alignment in Level 1, and each alternative in Level 2 and Level 3 screening, a determination was made as to whether an alignment or alternative would be carried forward in the SR 37 PEL Study, and if so, how it would be carried forward (as a core concept or a supplemental element).

Carried forward as a Core Concept—Standalone improvement that directly meets the SR 37 PEL Study's purpose and need.

Carried forward as a Supplemental Element—Additional improvement that does not fully meet the purpose and need on its own but improves the core concepts.

Eliminated—Core concept or supplemental element that does not meet the purpose and need identified for the SR 37 PEL Study.

Not Recommended—Core concept or supplemental element that will not be evaluated further in the SR 37 PEL Study because of comparatively negligible benefits or higher impacts than other concepts or elements.

CHAPTER 7

Alternatives Screening and Identification of the Preferred Alternative

The PEL Study Team screened alignments and alternatives at Levels 1, 2, and 3, using a progressively more refined set of criteria for rejecting or carrying forward an alignment or alternative at each level. This chapter summarizes that process and how the preferred alternative was selected based on the 43 final Level 3 criteria described in Chapter 6, *Alternatives Evaluation Criteria*.

A number of different appendices contain details supporting this chapter.

- Appendix F, *State Route 37 Planning and Environmental Linkages Study Level 1 Screening Report*, through Appendix H, *State Route 37 Planning and Environmental Linkages Study Level 3 Screening Report*, provide further details on the screening process, including meeting presentations, summaries of input collected, and related materials.
- Appendix I, *Preferred Alternative Constraints and Opportunities Mapbook*, provides a series of maps that reflect SWG and TWG input on potential constraints, resources, and desired points of access along the preferred alternative.[10]
- Appendix J, *Preliminary Conceptual Design and Plans for the Preferred Alternative*, includes preliminary conceptual design plans for the preferred alternative.[11]

[10] Appendix I contains information collected from the SWG and the plenary TWG between July and September 2022. Appendix I is not a comprehensive compendium of all sensitive resources, design constraints, or other issues that have been documented throughout this SR 37 PEL Study, but the information gathered is intended to help inform further design expected to follow the PEL Study.

[11] The design plans in Appendix J were created to facilitate the PEL Study process. It is anticipated that these plans will be refined in the Project Approval and Environmental Documentation phase expected to commence after the SR 37 PEL Study.

7.1 LEVEL 1 SCREENING OVERVIEW

Level 1 screening considered whether the proposed corridor alignments met the SR 37 PEL Study's purpose and need. Level 1 screening considered Alignments 1 through 8 (Figure 7-1) as well as various transportation modes. At this stage, screening was conducted with evaluation criteria that the PEL Study Team developed and refined in close consultation with the TWGs and the SWG, as described in Chapter 6.

In meetings conducted in February 2022, the PEL Study team consulted each of the three TWGs (Design, Environmental, and Traffic) in applying the Level 1 evaluation criteria (Appendix F).

7.1.1 Initial Level 1 Screening Recommendations

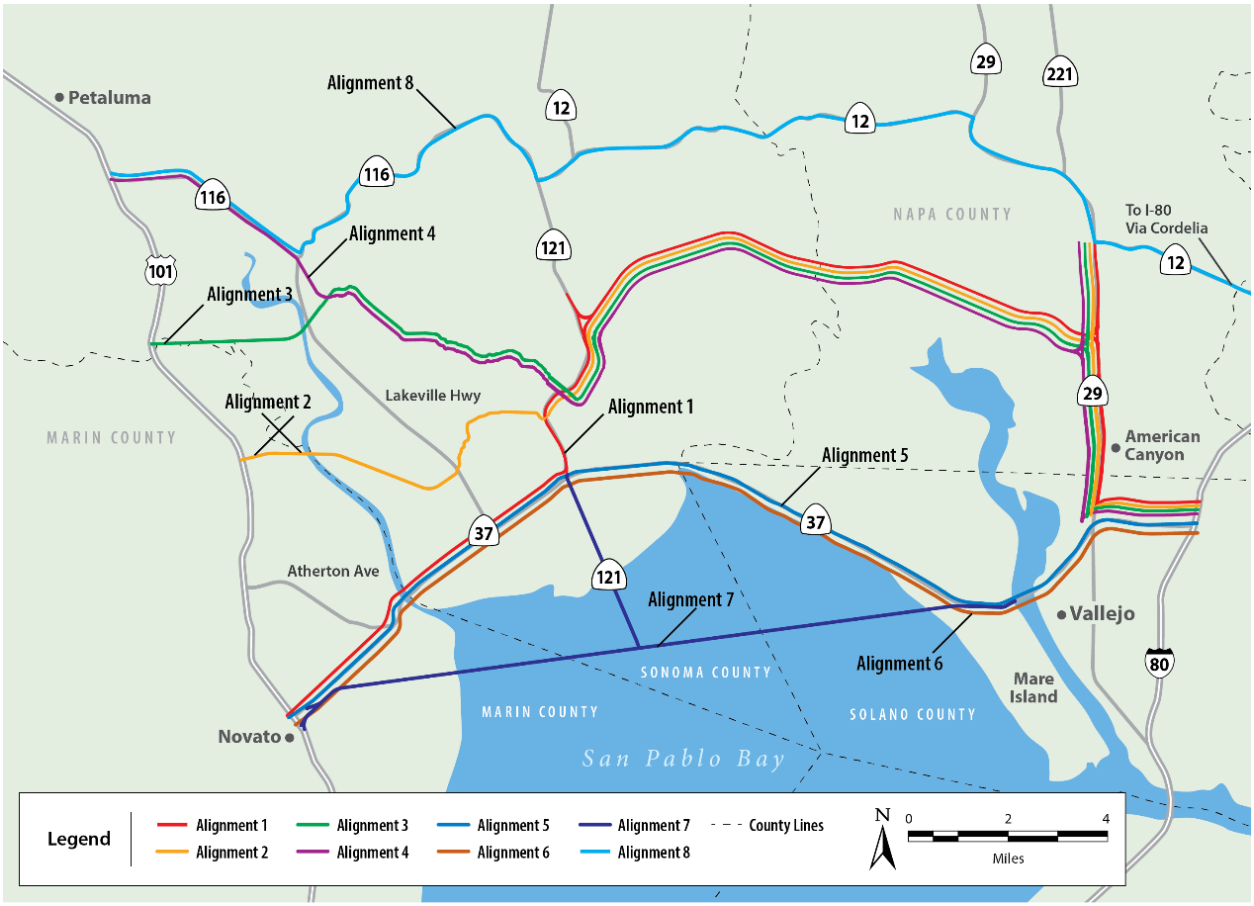
The PEL Study Team assessed all feedback received at the February 2022 TWG meetings. Their observations were that Alignments 1, 4, 5, 6, and 7 performed the best when evaluated against the criteria of purpose and need and Alignments 2, 3, and 8 performed poorly.

Alignments 2 and 3 would both require new interchanges on US 101 and on SR 29. These alignments would substantially change travel patterns, severing some existing community connections. For the same reason, these alignments would have limited ability to support viable transit service. Further, these alternatives would be constructed across the projected year 2130 marginal zone of sea level rise, an environmentally sensitive wetland area.

Alignment 8 did not meet the criterion of community connectivity, in particular for Vallejo, because it would not connect directly with Vallejo. Further, this alignment would increase VMT. The PEL Study Team thus recommended that Alignments 2, 3, and 8 be removed from further consideration.

In addition to considering roadway alternatives, the TWGs considered other transportation modes, including a floating bridge and ferries (Section 5.2, *Modal Menu*).

Figure 7-1. Alignments for Level 1 Screening



During Level 1 screening, the PEL Study Team noted that one pillar of the project purpose statement was to ensure bike and pedestrian access were included. Caltrans clarified that its policy is to include safe bicycle and pedestrian access as part of any new roadway corridor, such as SR 37. They clarified that this could take the form of a separate lane (immediately alongside a roadway, as on the Golden Gate Bridge), or a parallel route (such as along US 101 near the Study Area). Accordingly, the PEL Study Team advised that there would be no need to differentiate alignments based on *whether* they would include bike and pedestrian facilities. Instead, alignments could be evaluated on *how well* they would serve the needs and interests of pedestrians and bicyclists.

> Caltrans policy is to include safe bicycle and pedestrian access as part of any new roadway corridor.

7.1.2 Finalized Level 1 Alignment Recommendations

Consistent with the PEL Study Team's overall approach, the PEL Study Team shared its Level 1 screening recommendations with all three TWGs seeking feedback before the recommendations were finalized.

The TWGs generally agreed with the PEL Study Team's initial Level 1 screening recommendations but with two notable exceptions:

- Some TWG members disagreed that Alignment 4 should be carried forward, expressing concern that it could increase VMT.
    - In response, the PEL Study Team noted that Level 1 screening was strictly focused on purpose and need; VMT would be address in subsequent levels (Level 2 and Level 3). Because Alignment 4 did otherwise appear to meet Level 1 screening criteria, the PEL Study Team suggested it stay in the evaluation at least until Level 2.
- Regarding Alignment 8 having not fared well in meeting Level 1 screening criteria, TWG members emphasized to the PEL Study Team two distinct advantages of the alignment that should keep it in consideration (though not necessarily endorsing it). First, Alignment 8 would consist mostly of portions of existing routes (SR 116, SR 12, and SR 29), and therefore would require less new ROW to be procured. Secondly, Alignment 8 was the only alignment option fully outside the area expected to be fully inundated by sea level rise.

Following due consideration of the feedback from the working groups, the PEL Study Team finalized Level 1 screening recommendations, carrying forward Alignments 1, 4, 5, 6, 7, and 8. These alignments would be more fully developed into alternatives during the second and third level of screening.

Alignments 2 and 3 would not be carried forward for Level 2 screening.

7.1.3 Level 1 Modal Recommendations

Based on TWG feedback, the PEL Study Team proposed recommendations on two alternate modes, a floating bridge and a ferry.

Floating Bridge. While a floating bridge initially appeared to some as a potentially resilient solution to sea level rise, the concept was eliminated from consideration primarily because a floating bridge would impede marine navigation; and including non-floating sections of a floating bridge would pose engineering risks and possibly also introduce too steep a grade for climbing (particularly if a rail alignment were to adjoin the roadway). Accordingly, this modal option was not recommended to be carried forward.

Ferry. Ferries had been proposed as a potentially viable modal alternative because a ferry system is already operating in the area with existing terminals in Vallejo and Larkspur. The PEL Study Team noted that as a stand-alone alternative to roadway travel, ferries would lack the capacity to accommodate as many people as SR 37 does, particularly for commuting. In addition, the shallowness of San Pablo Bay and the lack of existing ferry infrastructure close to the existing western terminus of SR 37 in Novato presented further complications to ferries as an alternative to roadways. The TWGs also expressed concern that this option would require more

frequent dredging if new ferry service were established in the northwestern portion of San Pablo Bay.

Notwithstanding, the PEL Study Team noted the potential for ferry service to be expanded at existing terminals, serving as a complementary transportation resource. Such expansion could potentially include service between Vallejo and Larkspur, a route currently without direct ferry service. Based on this information, the PEL Study Team recommended that ferries be carried forward as a supplemental element of any prospective alternatives.

7.2 LEVEL 2 SCREENING OVERVIEW

At the outset of Level 2 screening, the PEL Study Team developed the *alignments* into more fully fledged *alternatives*. Whereas alignments merely indicated the general position of a roadway corridor, in developing alternatives, Caltrans added detail such as number of lanes, ROW width, shoulder widths, and general information on cut and fill. For each corridor alignment, the PEL Study Team considered four- and six-lane alternative options. For more information on the difference between alignments and alternatives, please refer to Section 5.1 and to Appendix G, *State Route 37 Corridor Planning and Environmental Linkages Study Level 2 Screening Report*.

In responding to feedback from the TWGs, the PEL Study Team created a new alternative, Alternative 9, which omitted the southerly (and overwater) extension of SR 121 (Figure 7-2; see also Section 5.1.2, *Feedback on Alignments*). In addition, the PEL Study Team added a new Alternative 10, a crossbay causeway plus existing SR 37 from US 101 to SR 121 (Figure 7-2). This alternative was similar to Alternative 7, but without the overwater extension of SR 121. The PEL Study Team added Alternative 10 at the suggestion of the ESC, who appreciated the direct connection Alternative 9 provided, but expressed concern that it would have resulted in creating a "dead end" at the end of SR 121 at Sears Point.

In all, Level 2 screening included Alternatives 1, 4, 5/6, 7, 8, 9, and 10 (Figure 7-3).

Figure 7-2. Alternatives 9 and 10

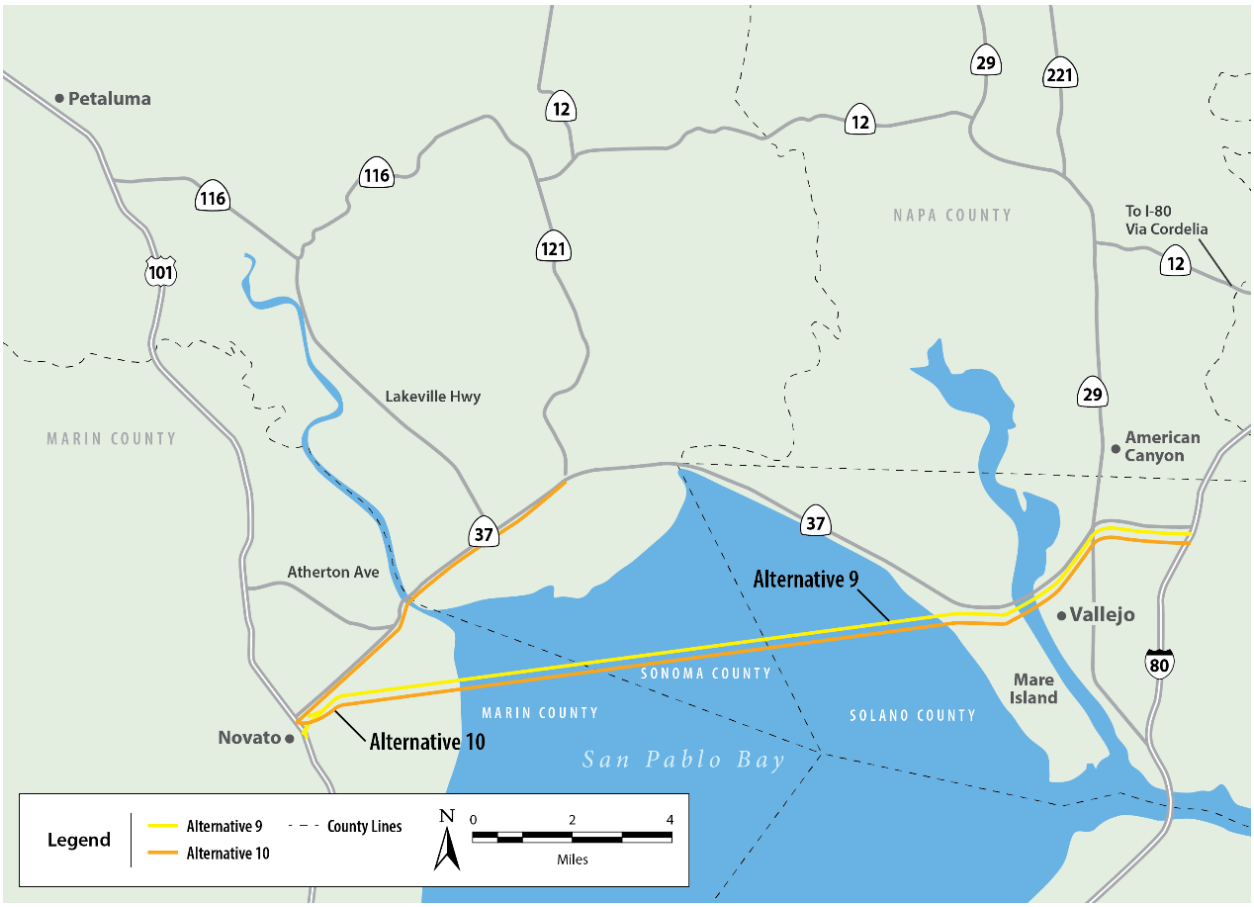
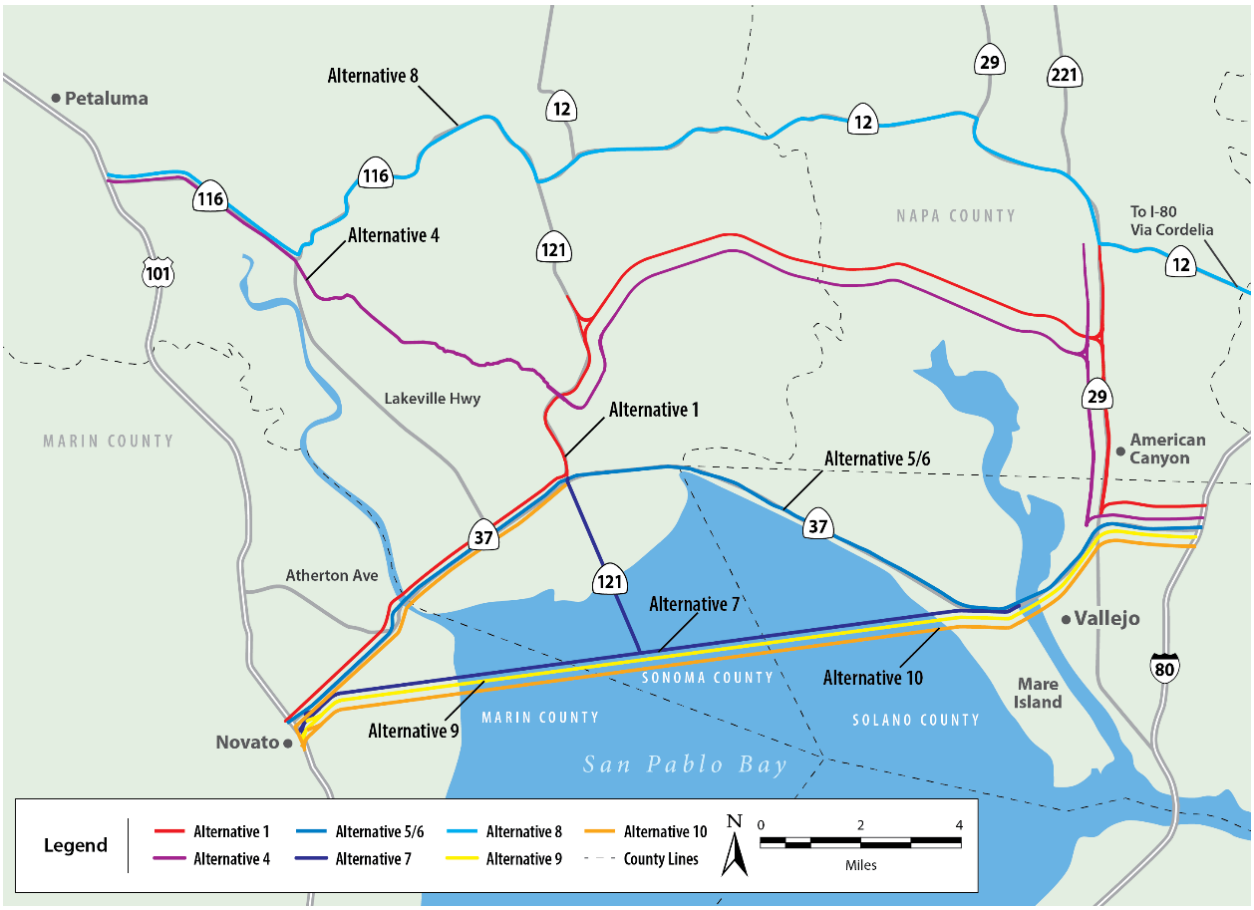


Figure 7-3. Alternatives for Level 2 Screening



As discussed in Chapter 6, Level 2 screening considered numerous design, environmental, and traffic criteria to distinguish among the alternatives. Design criteria focused on reuse of the existing infrastructure and ROW, maintenance of connectivity to local routes currently served by SR 37, increase or decrease of mileage for key origin and destination points, and ability of the alternatives' lane configurations to prioritize transportation modes that would increase person throughput.

Environmental criteria focused on how well the alternatives would allow for future habitat transitions with sea level rise and how well they would allow for landward marsh migration.

Traffic criteria focused on performance of the alternatives with respect to VMT and changes in travel patterns. Whether an alternative would induce new VMT was an important consideration for this screening level. Under Caltrans policy, any new induced VMT must be mitigated. Studies indicate that mitigation for one mile of additional VMT could range in cost from $500 to $3,000 per additional mile traveled. For the Level 2 screening, Caltrans used the VMT calculator from the National Center for Sustainable Transportation (NCST), which takes into account net new lane mileage and the typical travel patterns of the region (in this case, the pertinent county). For all alternatives that would retreat from the existing SR 37 corridor (i.e., Alternatives 1, 4, 7, 8, 9,

and 10) this calculation further assumed that the existing corridor would be decommissioned, reducing overall lane mileage accordingly.

7.2.1 Initial Level 2 Screening Recommendations

Following interactive workshops with the working groups in spring 2022, the PEL Study Team recommended that Alternatives 5/6, 8, 9, and 10 be carried forward into Level 3 screening. Key reasons supporting this recommendation are summarized below.

- Alternative 5/6, by generally following the existing SR 37 corridor, would not add new lane miles and thus would not induce VMT in a four-lane scenario. Alternative 5/6 would generally maintain existing travel patterns; its provision of a direct connection to the west for Vallejo further met equity concerns.
- Alternative 8, because it would utilize existing roadways and would entail the decommissioning of the existing SR 37 corridor, would not induce VMT in a four-lane scenario. Further, it was the only alternative fully outside the area expected to be fully inundated by sea level rise. However, Alternative 8 would not address equity concerns and would substantially alter existing traffic patterns.
- Alternative 9, because it would provide a shorter, more direct connection between US 101 and I-80 and would also entail the decommissioning of the existing SR 37 corridor, would not induce VMT in a four-lane scenario. Alternative 9 would generally maintain existing travel patterns on the respective western and eastern ends of the SR 37 corridor. However, its lack of a connection to SR 121 would alter some travel patterns to Sonoma and Napa. In addition, because it would be an overbay crossing, Alternative 9 would affect aquatic resources (both marshland and bay) insofar as fill would likely be required in multiple locations.
- Alternative 10 would induce a moderate level of VMT in a four-lane scenario at a level that appeared feasible to mitigate. By maintaining connectivity to SR 121 it would also generally maintain travel patterns. However, since it involves the same overbay crossing as Alternative 9, Alternative 10 would result in the same types of aquatic resources impacts as Alternative 9 and would likely require the use of fill.

7.2.2 Alternatives Not Carried Forward

Some alternatives were not recommended to be carried forward for several reasons. The PEL Study Team noted that all six-lane scenarios in any alternative corridor would induce substantial VMT, well beyond a level that could be feasibly mitigated. Three alternatives were not recommended to be carried forward. After applying the Level 2 evaluation criteria, the PEL Study Team also recommended that Alternatives 1, 4, and 7 not be carried forward for the reasons summarized below.

- Alternative 1 would substantially induce VMT in a four-lane scenario due to the number of lane miles added. While Alternative 1 would maintain travel patterns on the west, it would not on the east, raising equity issues, particularly regarding Vallejo. Alternative 1

would also introduce a new footprint for over half of the corridor alignment, likely resulting in substantial environmental impacts associated with conversion of wetlands and impediment to high-quality migration corridors.

- Alternative 4 would substantially induce VMT in a four-lane scenario. Similar to Alternative 1, Alternative 4 presented equity issues by not providing Vallejo a direct connection to the west. Like Alternative 1, Alternative 4 would involve a new footprint for over half the alignment, particularly in wetland areas.
- Alternative 7 would result in some induced VMT in a four-lane scenario. In addition, the proposed interchange in the middle of the bay would present design, construction, and maintenance issues and, because of the construction of the causeway in the bay, it would have impacts on aquatic critical habitat and would affect aquatic migratory species movement.

7.2.3 Modal Recommendations

Rail. Most alternatives recommended in Level 2 screening (Alternatives 5/6, 9, and 10) would allow a new rail line to be constructed alongside the highway; none of the alternatives would pose any conflict with the existing SMART-owned tracks between Novato and American Canyon. Accordingly, rail was carried forward to Level 3 as a supplemental element.

Bus. All alternatives included peak period shoulder running lanes, which would offer better opportunities for a bus operator to offer service in the SR 37 corridor, which is not currently served by any bus route.

Ferries. Ferry service is challenging for passengers with destinations other than the ferry terminal, and a 2019 Water Transit Feasibility Study indicated that only the route between Vallejo and San Francisco would generate sufficient ridership. Therefore, the PEL Study Team did not recommend ferry service to be carried forward as a core concept. However, because ferry service is compatible with the roadway alternatives, the PEL Study Team recommended that ferries be carried forward as a supplemental element.

7.2.4 Design Option Recommendations

Causeway and embankment. Extensive use of embankments would have substantial adverse environmental consequences, particularly on marsh habitat. In addition, based on recent geotechnical analysis conducted by MTC for the DAA Study from US 101 to Sears Point (MTC 2022), constructing a long embankment would likely require cement deep soil–mixed columns to transfer structure loads to less compressible soils beneath the bay mud. Because of the depth of bay mud in the region, contractor input noted that depth past 100 feet is not recommended "due to increasing complexity and decreasing success at deeper depths" (MTC 2022); this would make long embankments across the bay infeasible. Therefore, the PEL Study Team recommended a design that is majority causeway with limited areas of embankment where

absolutely necessary (e.g., making the transition from at-grade to causeway structures) be carried forward.

Number of lanes. The PEL Study Team recommended that all six-lane scenarios not be carried forward because they would result in substantial induced VMT. Accordingly, only four-lane design options were carried forward for each alternative to Level 3 screening. Shoulder running lanes would be open for use during peak period and could also be managed for HOV or bus use only. The PEL Study Team also recommended that this design option be carried forward.

Tunnel. The PEL Study Team noted that the tunnel option was not recommended to be carried forward because its costs would far exceed those of a causeway structure. These increased cost estimates are a direct result of the substantial additional risk involved in constructing any underwater structure, but particularly one in the shallow bay and bay mud environment of San Pablo Bay. The risk of natural causes such as earthquakes, fires, and flooding could also damage the tunnel. During construction, unpredictable challenges could involve accommodating existing submerged utilities or encountering different soil types. Furthermore, a tunnel design of this length (about 15 miles) would present substantial challenges to viable use by bicyclists and pedestrians.

7.3 LEVEL 3 SCREENING OVERVIEW

In July 2022, the PEL Study Team asked the TWGs[12] to apply the Level 3 evaluation criteria to the alternatives. Level 3 criteria primarily focused on transportation and environmental factors, including VMT, wildfire risk, recreation access, EPCs, farmland conversion, indirect and direct land conversion, and several habitat-related metrics (Appendix H).

> Level 3 criteria primarily focused on transportation and environmental factors.

For Level 3, the VMT evaluation used the context-sensitive Plan Bay Area 2050 model that was released in late 2021 rather than the NCST VMT calculator used for Level 2 screening. The Plan Bay Area 2050 model provides other information in addition to VMT calculations, such as origin-destination pairs, that describe regional travel patterns. Both the NCST VMT calculator and the Plan Bay Area 2050 model provide valid and usable estimates of VMT; the PEL Study Team encouraged the use of both for a more nuanced and complete assessment of VMT.

As described in Section 5.1.2, for Level 3 screening, the PEL Study Team recommended consideration of Alternative 5, rather than the combined Alternative 5/6 that had been used in previous screening levels. This decision was made because TWG members indicated a

[12] While prior TWG meetings had been held as separate meetings for each TWG, beginning in July 2022 the TWGs met jointly.

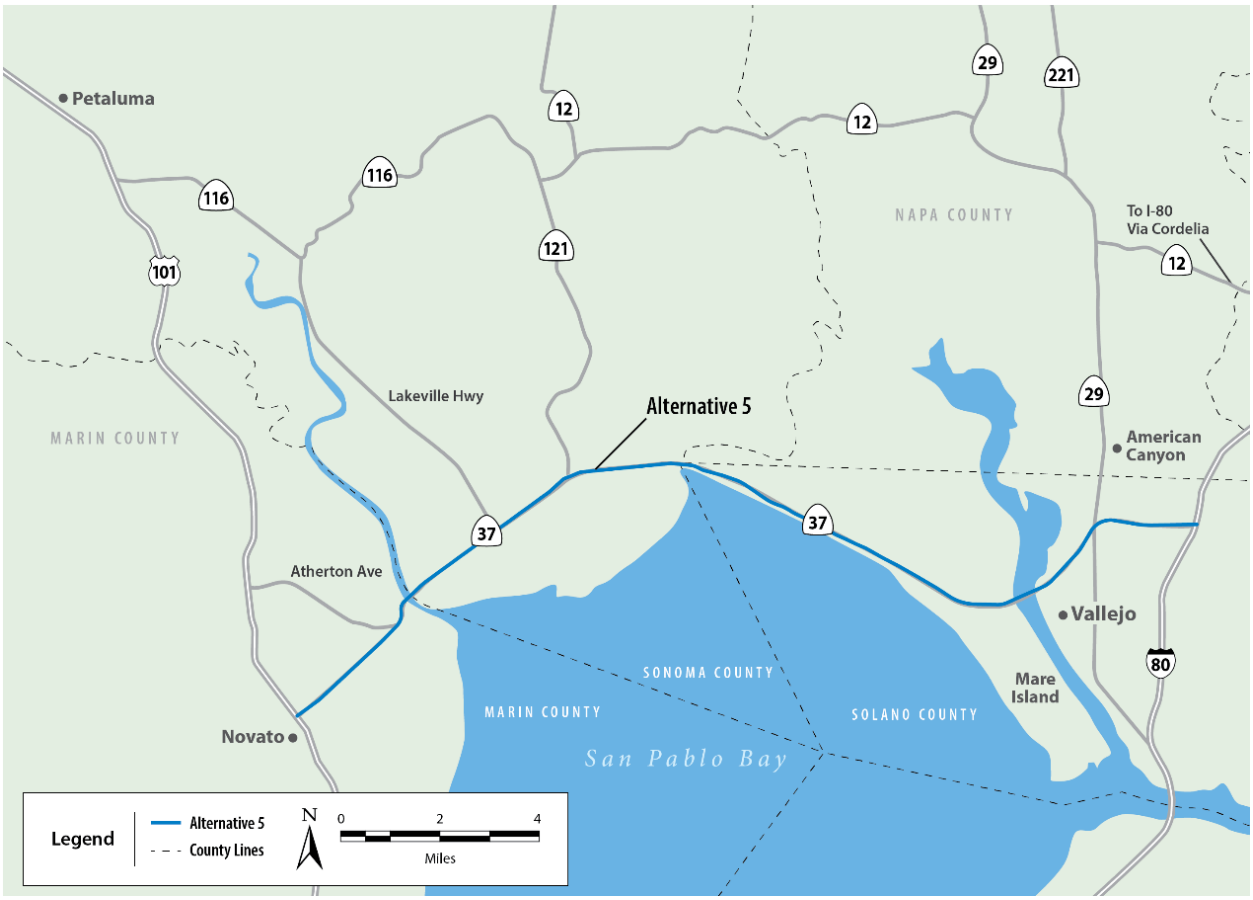
preference for the causeway option, reflected in Alternative 5 because it would have substantially fewer impacts on existing resources.

7.3.1 Initial Level 3 Screening Recommendations

Based on a review of all analysis and feedback, the PEL Study Team observed that Alternative 5 was the alternative that best met the Level 3 evaluation criteria (Figure 7-4). Accordingly, the PEL Study Team recommended that this alternative be carried forward as a core concept. There was broad support from the TWGs and the SWG to carry forward this alternative for the reasons summarized below.

- Alternative 5 was determined to have the least impact on transportation. It would not increase VMT in the long term. Importantly, this alternative would maintain access routes to key destinations for EPCs. In addition, it performed the best among the alternatives in terms of maintaining regional travel patterns.
- The construction of Alternative 5 primarily on a causeway rather than embankment was determined to have multiple benefits. Alternative 5 would facilitate adaptation to sea level rise and natural processes, despite having some impacts on tidal marsh and aquatic transition zones, and would not interrupt terrestrial or aquatic migration. Further, it would not impede any existing or planned restoration projects.
- Alternative 5 was determined to have the least effect on land use changes. It would convert the least amount of land to transportation use because it would follow the same alignment as the current SR 37. In addition, it would convert no Prime Farmland and only an acre of Unique Farmland to nonagricultural use. It would maintain access to recreational facilities.
- Alternative 5 was determined to have impacts related to noise and stormwater treatment, although both would be mitigable. Alternative 5 would likely require some form of noise abatement, although these would be in areas already affected by noise from the current SR 37. In addition, stormwater treatment can be provided onsite, but there would be added expense to convey stormwater from the causeway to an appropriate treatment location.
- Finally, Alternative 5 would cross a moderate wildfire risk area, but only for two miles. Alternative 5's elevated causeway design would minimize the potential for a wildfire emergency–related closure (particularly relative to a primarily at-grade option like Alternative 8).

Figure 7-4. Preferred Alternative: Alternative 5



7.3.2 Alternatives Not Carried Forward

The PEL Study Team did not recommend that Alternatives 8, 9, and 10 be carried forward. Key concerns regarding Alternative 8 included greater conversion of land to transportation use and farmland to nonagricultural uses; greater change in traffic patterns, including changes that would affect EPCs; greater impacts on habitat through increased cut and fill and construction in undisturbed areas; and greater noise impacts, requiring 15 miles of new noise abatement. There was very limited SWG support for carrying this alternative forward.

Key concerns regarding Alternative 9 included greater conversion of land to transportation use; alteration of travel patterns, including modification of access routes for EPCs to their key destinations; greater impacts relating to noise and visual resources and greater cost for mitigating stormwater; and minimal or no access to recreational areas. Further, extensive lengths of causeway and bridge structures would have to be built across the bay in areas where the geomorphology is not as well-known and understood.

Key concerns regarding Alternative 10 included greater impacts relating to noise and visual resources and greater cost for mitigating stormwater; and minimal or no access to recreational areas. Further, extensive lengths of causeway and bridge structures would have to be built

across the bay in areas where the geomorphology is not as well-known and understood. There was limited SWG support for carrying this alternative forward.

7.3.3 Modal Recommendations

Bicycle and pedestrian access. Caltrans requires bicycle and pedestrian access in new roadways. The PEL Study Team decided that for the purpose of the PEL Study with only a conceptual level of design, the bicycle and pedestrian pathway would be on the same structure as the roadway, with design details to be determined later.

Rail and bus. The decision on rail would be made by SMART. Alternative 5 would enable reliable bus service between Marin and Solano Counties through a direct route. Any such access would be implemented by local bus providers. As further discussed below, SMART is investigating opportunities to reconstruct its railroad (east of Novato) alongside proposed SR 37 improvements (SMART 2022).

Ferry. The implementation of ferry service lies with local ferry transit providers. Alternative 5 would not impede the implementation of ferry service.

7.3.4 Design Considerations

Causeway and embankment. Alternative 5 would be primarily constructed on causeway, with limited embankment. Existing fill for SR 37 would be removed from sections built on causeway.

Number of lanes. Alternative 5 would have two lanes of travel in each direction, with a shoulder running lane for peak period use.

Access. Access would be provided through interchanges, intersections, and limited direct access points that would be fully determined later with detailed design.

7.4 PREFERRED ALTERNATIVE

7.4.1 Characteristics of the Preferred Alternative

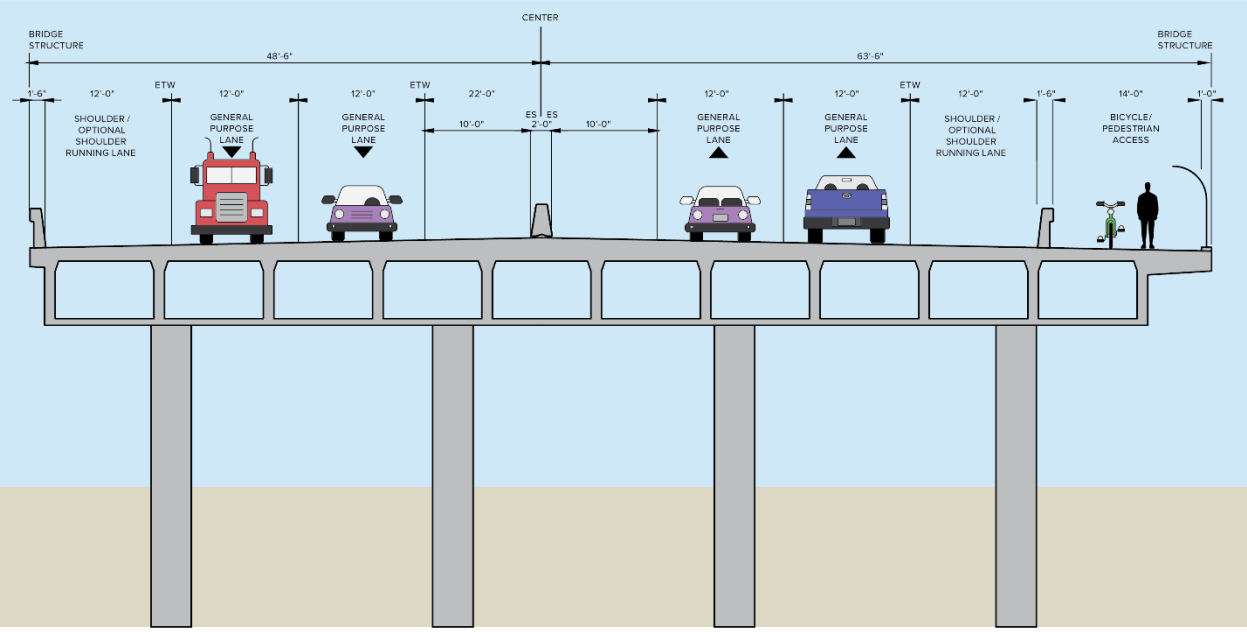
The preferred alternative would be constructed mostly on a causeway, although portions would be constructed at grade or on an embankment (Figure 7-5). The causeway construction allows for sufficient roadway elevation and clearance above the water level to accommodate sea level rise and avoid flooding. It also allows bay waters to move increasingly farther inland as sea level rises. The preferred alternative would be

The preferred alternative would be constructed mostly on a causeway.

designed as an expressway with two travel lanes and a peak period shoulder running lane[13] in each direction (Figure 7-6). The expressway would have interchanges, intersections, and limited direct access points. The posted speed limit would be 60 mph. In addition, the preferred alternative would feature bicycle and pedestrian access to accommodate travel in both directions.

Figure 7-5. Cross-Section of the Preferred Alternative

4-LANES (2GP/2GP) WITH BICYCLE/PEDESTRIAN ACCESS - CAUSEWAY



R/W = RIGHT-OF-WAY
ES = EDGE OF SHOULDER
ETW = EDGE OF TRAVEL WAY

[13] A shoulder running lane is a paved shoulder that is converted to travel use during portions of the day as a congestion relief strategy.

Figure 7-6. Plan View of the Preferred Alternative

An existing rail line owned by SMART travels along the route of the preferred alternative between Novato and Sears Point. SMART has proposed a plan to utilize this line for expanded passenger service to Suisun City. SMART has also published planning studies indicating a possible preference for a more direct new rail line between Novato and Suisun City.

The preferred alternative would not conflict with the existing rail line; moreover, it offers a potential opportunity for SMART to consider reconstructing its rail line east of Novato, which like much of SR 37 is susceptible to sea level rise in coming decades. Caltrans will continue to coordinate with SMART should SMART opt to make improvements to its rail system where it is parallel to the preferred alternative. Moreover, the preferred alternative would help resolve existing rail conflicts (e.g., the existing at-grade crossing east of Sears Point).

7.4.2 Further Refinement of the Preferred Alternative

After identification of Alternative 5 as the preferred alternative Caltrans led a series of meetings in July through September 2022 with the SWG and the plenary TWG to gather additional information that would further inform the design process. The groups responded with information about resources and access beyond what had been previously documented. This locational information was captured live during the meetings on a Google Earth map presented during these meetings (Figure 7-7). Appendix I shows these locations on maps and provides a brief explanation of the resources or access points.[14] Resources included sensitive natural areas for the preferred alternative to avoid or consider; hydrologic features for the preferred alternative to

[14] The information contained in Appendix I represents information collected from the SWG and the plenary TWG between July and September 2022. Appendix I is not a comprehensive compendium of all sensitive resources, design constraints, or other issues that have been documented throughout this SR 37 PEL Study.

account for; and other resources and constraints that would affect design. Access discussions focused on current access points that the respondents hoped would be maintained.

Sensitive natural areas included raptor perches, restoration areas and potential restoration areas, habitat for protected species and water birds, a hunting club, a ranch, and managed upland areas. Hydrologic features consisted of locations where inundation and flooding already occur; existing pumps, overflow basins, intakes, and bridges; and aquatic habitat. Other resources and constraints included SMART rail locations; utility features such as sanitation treatment plan, Pacific Gas and Electric Company substation, irrigation and underground infrastructure piping; locations of levee maintenance needs; locations of needed interchange reconfiguration; and planned redevelopment of land.

In addition to the resources identified above, meeting participants in the meetings suggested where access should be maintained. Their recommendations included access to specific roads (e.g., Atherton Avenue, Renaissance Road); boat launch facilities; levees for maintenance; agricultural fields and roads; recreational facilities; and specific sites such as Tubbs Island, Wing & Barrel Ranch, and the Duck Club. Considering that some of these locations might be under water in the future, and that roadway design will make some of the remaining access points more or less feasible, Caltrans will thoroughly review the status of these current access points as implementation planning progresses.

Figure 7-7. Example of Working Group Participants' Input Captured on Google Earth

CHAPTER 8

Implementation Plan

As described in Chapter 7, *Alternatives Screening and Identification of the Preferred Alternative*, and depicted in Appendix J, *Preliminary Conceptual Design and Plans for the Preferred Alternative*, the preferred alternative would generally follow the existing SR 37 corridor alignment but primarily on a new elevated causeway, with new interchanges or intersections at major roadway crossings.

8.1 MOVING FROM PEL TO IMPLEMENTATION

With the identification of the preferred alternative, this chapter of the SR 37 PEL Study considers pathways to transition from this PEL effort to further design, environmental review, construction, and operation of the proposed solution for the SR 37 facility.

Although the SR 37 PEL Study has provided vital environmental information that has informed the alternative selection process, environmental review under both NEPA and CEQA remains as a major prerequisite before construction can begin. Accordingly, one of the key considerations for Caltrans in moving from the completion of this SR 37 PEL Study to implementation is how to move forward with environmental review.

Caltrans fully expects that environmental review will lead to fine-tuning of the preferred alternative for specifics such as roadway profile, transitions at intersections, and location relative to the existing SR 37 (i.e., on the north and/or south side of the existing roadway). In other words, the preferred alternative design plan set provided in Appendix J is a milestone representing the end of the SR 37 PEL Study and a "running start" to the Project Approval and Environmental Document (PA&ED) process.

While the SR 37 PEL Study has focused on the full length of the corridor—from US 101 on the west to I-80 on the east—the PEL Study Team has identified four approaches to conducting the requisite project-level NEPA and CEQA environmental review:

A. Prepare one environmental document that evaluates the temporary and permanent impacts of the entire preferred alternative for the SR 37 corridor at a project level of detail.

B. Prepare a programmatic environmental document for the preferred alternative as a whole followed by project-level reviews of individual segments.

C. Deliver the preferred alternative as a collection of smaller individual but related projects, each of which have logical termini and independent utility; prepare multiple individual environmental documents as each individual project is developed and funded for construction; assume cumulative impacts would only take into account other planned and programmed (funded) projects as "reasonably foreseeable," thus potentially excluding cumulative analysis of the whole of the preferred alternative. Conduct consultations and obtain permits for each smaller project successively.

D. Same as C, except with the first and each successive environmental document, consider the entirety of the preferred alternative (as defined in the SR 37 PEL Study) through a programmatic cumulative analysis and enter into programmatic consultations, seeking to obtain programmatic biological opinions from the USFWS and NMFS.

> Environmental review under both NEPA and CEQA is a major prerequisite before construction can begin.

Each of the four approaches has its pros and cons and is considered in more detail below.

Approach A. Single environmental document for the entire preferred alternative at a project level of detail

This approach offers a straightforward, seemingly simple approach. It would create one NEPA/CEQA document for the entire preferred alternative—the entire SR 37 corridor from US 101 on the west to I-80 on the east. However, there are several concerns regarding this approach. The following paragraphs discuss initially identified concerns.

As part of the SR 37 PEL Study, Caltrans prepared high-level cost estimates for the alternatives carried forward into the Level 3 screening analysis. The preliminary low-end cost estimate for construction of the preferred alternative is $6.2 billion for the entire 21-mile length of the corridor (estimated in 2022 construction dollars). However, this estimate is based on limited design and focused on major design elements and excludes other related costs, including constructability challenges in the bay mud, additional costs related to height of piers that are not yet determined, additional engineering and design work, removal of the existing SR 37 roadway and embankment, environmental studies, and environmental mitigation. Based on the recent *Design Alternatives Assessment from US 101 to SR 121* (MTC 2022), which evaluated the entire corridor to a higher level of detail, consideration of these other factors could bring the ultimate cost for the

entire corridor up to a total of $11.2 billion. Therefore, the expected range of costs for the entire corridor is likely between $8.0 and $11.2 billion. For more information on the methodology and assumptions that went into the cost estimates, see Appendix M, *Preferred Alternative—Cost Estimation Background*.

In order for Caltrans to approve a project-level environmental document, it must have funding identified in a fiscally constrained regional transportation plan for the next phase of the project. As of fall 2022, Caltrans does not have such funding in place and does not anticipate that funding on this scale could be assembled in any timely manner.

Approach A, however, would not only require developing full design of the preferred alternative, but conducting the project-level environmental review for its entire corridor as well. One key element of such a review would be protocol-level biological surveys over significant portions of the corridor, including for protected species and wetlands. Such surveys would likely have to be repeated, perhaps multiple times over many years, in the highly likely scenario of the preferred alternative being built in multiple phases. Consultations with federal and state agencies might thus need to be supplemented repeatedly over a long period. The seeming simplicity of a single environmental document would be further diluted by the likely need for multiple reevaluations/revalidations under NEPA and CEQA to confirm that project circumstances have not changed, and new environmental effects have not arisen that were not otherwise covered in the underlying environmental document.

Approach B. Programmatic environmental document for entire preferred alternative followed by project-level reviews of construction segments

This approach also presents opportunities and challenges. Similar to a project-level review, preparing a programmatic document would present the whole of the preferred alternative even if impacts and mitigation measures remained more high level since they would be based on more conceptual-level plans. While signaling to project stakeholders and the public Caltrans' intent to construct the preferred alternative as a whole could be of benefit to the public in general and resource/permitting agencies in particular, a major concern of a programmatic analysis is that it would likely further delay the start of any construction.

The SR 37 PEL Study collected valuable information that could support a programmatic environmental document. Indeed, at the outset of the SR 37 PEL Study, Caltrans advised project partners, resource agencies, and other stakeholders that the SR 37 PEL Study would have aspects resembling a programmatic environmental document.

While initiating a programmatic document at the close of the SR 37 PEL Study would be a very different proposition from starting a programmatic document without the benefit of the PEL, shifting resources to preparing and approving a programmatic document would still likely require two or more years and would have to be followed by project-level review of constructable segments (likely at least another two or more years, depending on the complexity of the segment).

Approach C. Project-level review of individual segments of the preferred alternative

The approach of delivering the preferred alternative as a set of smaller successive, interrelated projects that could stand on their own but eventually be woven into the corridor as a whole has its own challenges and opportunities. Among likely challenges could be the public perception that Caltrans would not build the entire preferred alternative end-to-end. However unlikely the prospect of building just a single section of the preferred alternative is, given the oncoming inundation of sea level rise, a project-level review could—arguably—move forward with a cumulative analysis that only takes into account other reasonably foreseeable future projects.

In the cumulative environmental review of transportation projects, the term *reasonably foreseeable* typically means only projects that are planned and programmed (i.e., funded). Unfunded projects are thus not considered reasonably foreseeable and are typically excluded from cumulative analysis. Assuming Caltrans were to go forward with an initial first project-level review of an individual segment of the preferred alternative, it is highly unlikely that Caltrans would have secured funding for other segments (let alone the whole of the preferred alternative). Accordingly, the environmental document for the first project-level review could—once again, arguably—exclude other portions of the preferred alternative from its cumulative analysis.

From a resource agency perspective, this approach would also create uncertainty about a complete understanding of impacts and mitigation measures associated with the preferred alternative, creating the potential for multiple consultations (e.g., individual biological opinions for each separate segment) and attendant inefficiencies. Caltrans heard concerns from federal and state resource agencies on such an approach to consultation and permitting.

Despite these challenges, there appear to be some benefits of this approach. The primary benefit is the most expeditious transition from the end of this SR 37 PEL Study to some construction that would enhance travel conditions and improve resiliency for a portion of the corridor.

Approach D. Project-level review of individual segments of the preferred alternative with programmatic cumulative analysis (and biological opinions) of entire preferred alternative

> Project-level environmental review of individual segments of the preferred alternative… with a cumulative analysis covering the entire corridor.

Based on Caltrans's discussion of Approaches A through C with project stakeholders, in particular with resource agencies and county transportation agencies, the PEL Study Team sees a fourth approach as potentially most viable. Approach D would include project-level environmental review of individual segments of the preferred alternative. Each individual project-level environmental review would include a cumulative analysis covering the entire preferred alternative even in the very likely circumstance that full funding for construction of the entire preferred alternative was not in place. Although not typical practice, this would be a

reasonable assumption to make in light of anticipated sea level rise; without buildout of the entire preferred alternative in a high sea level rise scenario, portions of the corridor will soon be impassable. Construction of a smaller portion of the preferred alternative would not function for long in a high sea level rise scenario.

Caltrans anticipates that a cumulative analysis of the full preferred alternative would help support programmatic consultations with USFWS, NMFS, and other permitting agencies as well as related project-level consultations for individual construction efforts.

One factor supporting this approach is that the analysis conducted for the SR 37 PEL Study was highly cumulative in nature. Environmental impacts identified in the Level 2 and Level 3 screenings were for entire corridors. Background information from the SR 37 PEL Study could therefore be adapted into a cumulative case analysis for the entire preferred alternative.

The remainder of this chapter provides further considerations and recommendations to support Approach D. This includes the factors to consider in dividing the preferred alternative into smaller projects and what some prospective smaller projects could look like and why they would potentially be deliverable. In addition, this chapter includes discussion of funding sources that could potentially support both environmental review and construction of the preferred alternative.

Logical termini and independent utility are important criteria for federal aid transportation projects and their environmental review (23 CFR 771.111(f))

Logical termini means the endpoints of a transportation project make sense in terms of physical continuity between origins and destinations, involved jurisdictions, and/or resources.

Independent utility means a project does not require other improvements to achieve its purpose. It can provide benefits standing on its own.

Along with logical termini and independent utility, FHWA regulations further stipulate that a transportation project should not restrict consideration of other reasonably foreseeable transportation improvements.

In the context of the preferred alternative, the use of these terms does not mean that a smaller individual project would be all that is ever constructed. Impending sea level rise will not wait; the need for the entire preferred alternative as established during the SR 37 PEL Study remains as strong as ever.

8.2 PHASING CONSIDERATIONS

In past planning studies of the SR 37 corridor, Caltrans and others broke the corridor into three segments: A, B, and C. This division of the corridor was helpful for planning purposes and did not necessarily reflect a determination of possible division or priority of construction.

At the completion of the SR 37 PEL Study, the PEL Study Team has arrayed a much richer list of criteria to consider in dividing the preferred alternative into a series of smaller projects. These include:

- Ability to demonstrate logical termini, independent utility, and not restrict the consideration of other reasonably foreseeable transportation improvements.

- Constructability challenges such as adequate space for staging areas, construction accesses, material delivery, and general movement of traffic during construction that can affect project limits.
- Interchanges (including their transitions and ramps) can often be stand-alone projects for their operational improvements.
- Potential to change regional and local travel patterns (for better or worse) needs to be considered when determining the limits of projects.
- Access issues for existing properties directly along SR 37, and those served by roads that tie into and rely on SR 37.
- Large bridge structures will be very costly, which may limit the length of corridor that can be constructed in one project. In addition, their long approaches will need to address grade issues and terminate at an elevation that matches existing ground and requires little rework to tie into the future profile of the SR 37 corridor.
- Potential for coordination of improvements and mitigation with other projects in or near the corridor, such as restoration efforts by others adjacent to or accessed off of SR 37.

During the SR 37 PEL Study, many participants expressed confusion regarding the PEL's longer-range planning efforts that were being conducted simultaneously with a series of proposed near-term projects intended to keep the road in a good state of repair. The near-term projects were identified and programmed with the understanding that the implementation of the PEL preferred alternative would be many years in the future, following environmental review, further design, and assembly of sufficient funding. To some participants it seemed counterintuitive to consider near-term roadway improvements that might be completely replaced in a relatively short timeframe. However, with the assumption that implementation of the preferred alternative could be 15 or more years in the future, Caltrans had identified the near-term projects to preserve and enhance the existing SR 37 for the period between now and then. Figure 8-1 illustrates some of the near-term operational, maintenance, and pedestrian safety enhancement projects planned (as of 2022) by Caltrans and others to keep the existing SR 37 in a state of good repair and to make it more functional and predictable for users.

Caltrans identified near-term projects to preserve and enhance the existing SR 37 for the period between now and when the preferred alternative can be implemented.

Figure 8-1. SR 37 Projects to Address Near-Term Operational, Maintenance, and Pedestrian Safety Issues

Map ID	County	Project Limits	Project Type	Project Description
A	Marin	US 101/SR 37 Interchange to Petaluma River	Maintenance	SR 37 Pavement Rehabilitation—Rehabilitate mainline and ramp pavement, correct the existing settlement, replace metal beam guard rails, and upgrade curb ramps
B	Marin/ Sonoma	Petaluma River Bridge on SR 37	Maintenance	SR 37 Bridge Preservation—Address identified Petaluma River Bridge maintenance issues (resurface bridge deck, replace fender systems, scour protection, and upgrade bridge railings)
C	Sonoma	SR 37/SR 121 Intersection at Sears Point	Operational	Improvements to vehicular operations at SR 37/SR 121 intersection
D	Sonoma/ Solano	Sears Point to Mare Island on SR 37	Operational	Improvements to SR 37 east of SR 121 to Mare Island (Walnut Avenue)
E	Solano	Napa River Bridge	Maintenance	Napa River Bridge – overlay of bridge deck (preventive maintenance)
F	Solano	SR 37/Fairgrounds Drive	Pedestrian Safety	Enhance pedestrian safety at uncontrolled intersections and ramp termini

SR = State Route
US = U.S. Highway

8.3 POTENTIAL PHASING OF PREFERRED ALTERNATIVE

Considering the many factors discussed in Section 8.2, *Phasing Considerations*, the near-term projects, and what Caltrans has learned about the corridor through the preparation of the SR 37 PEL Study, the PEL Study Team has identified a possible way of dividing the preferred alternative into several smaller projects, each of which could deliver improvements independently but eventually be integrated into the entirety of the preferred alternative. Figure 8-2 illustrates this proposed potential phasing. Numbering of these smaller projects is from west to east and should

not be construed as a proposed order of construction, but rather as a preliminary and flexible framework with which to transition from this PEL to the PA&ED phase.

As described in further detail below, each of the eight smaller projects would meet the three-part test for federal aid transportation projects: independent utility, logical termini, and not restricting consideration of other reasonably foreseeable transportation improvements.

Figure 8-2. Potential Phasing Strategy for SR 37 Preferred Alternative

Section ID	County	Proposed Phase	Rationale	Estimated Cost/ Range $ 2022
1	Marin	US 101/SR 37 Interchange	Interchange and access road improvements	$150 million
2	Marin	US 101 to Atherton Avenue (SR 37 Flood Reduction Project)	Causeway	$789 million to $1.4 billion
3	Marin	Atherton Avenue to Petaluma River	Embankment/at grade, local access issues	$87 million–$157 million
4	Marin/ Sonoma	Petaluma River Bridge to East of San Pablo Bay National Wildlife Refuge Headquarters	Causeway	$972 million–$1.7 billion
5	Sonoma	East of San Pablo Bay National Wildlife Refuge Headquarters to SR 37/SR 121 Interchange at Sears Point	Embankment/at grade	$75 million–$134 million
6	Sonoma	SR 37/SR 121 Interchange at Sears Point	Interchange improvements	$67 million–$120 million
7	Sonoma/ Solano	SR 37/SR 121 Interchange to SR 37/Walnut Avenue Interchange at Mare Island	Causeway	$2.9 billion–$5.2 billion
8	Solano	SR 37/Walnut Avenue Interchange at Mare Island to I-80	Causeway and coordination of multiple interchanges	$1.4 billion–$2.5 billion
Total Range				$6.3 billion–$11.1 billion

SR = State Route
US = U.S. Highway

To develop this list of prospective smaller projects, the PEL Study Team considered the factors in Section 8.1, *Moving from PEL to Implementation*, along with information gathered during the SR 37 PEL Study. This discussion provides the rationale for each section, along with a discussion of how each could connect with adjacent sections. Cost estimates in 2022 construction dollars are also included. As funding availability is secured, it is possible that two or more of the sections could be combined into a single construction project.

1. **US 101/SR 37 Interchange:** This interchange currently connects at-grade portions of US 101 to at-grade portions of SR 37. In order to connect to the proposed causeway in Section 2, modifications to this interchange will be required. Since much of this interchange is currently elevated, there are opportunities to utilize existing portions in the preferred alternative. This section was identified as a possible stand-alone project in the event that the traffic operations or structure conditions deteriorate to a point that improvements become necessary. Improvements to the interchange would be designed to accommodate both the typical section of SR 37 and sea level rise as identified in the SR 37 PEL Study. Because no design of the interchange itself was conducted for the SR 37 PEL Study, a cost estimate of $150 million for the reconstruction of the interchange was based on professional judgment and other comparable projects. If sufficient funding becomes available, this section can also be combined with Section 2.
2. **US 101 to Atherton Avenue:** This section will help address current flooding issues at Novato Creek by converting existing at-grade sections to a raised causeway. In summer 2021, Caltrans began a separate effort known as the Flood Reduction US 101 to SR 121 project (Caltrans EA 04-4Q320) intended to elevate the roadway to accommodate projected sea level rise of year 2130 in this particularly flood-prone area. At Atherton Avenue, the causeway would transition to the adjoining section to the east, which is at higher elevation than the at-grade section. This section will be constructed independently of the interchange in Section 1 and the at-grade roadway in Section 3. The bicycle and pedestrian facility of this section would need to transition to at-grade elevations to the east and west. Similarly, the wider shoulders and cross section of the preferred alternative would need to tie into the interchange in Section 1, as well as to the at-grade profile in Section 3.

   As this section will extend to the US 101/SR 37 interchange, including reconstructed ramps, the estimated cost to construct is expected to range from $789 million to $1.4 billion.
3. **Atherton Avenue to Petaluma River:** At present, this section rises up to about 75 feet above sea level and accordingly can more readily connect with adjacent elevated portions to the west (causeway to be constructed) and the east (the Petaluma River Bridge). This section was identified as a possible stand-alone construction project because it would make improvements to the at-grade section of the corridor and would allow for some access and interchange improvements at Black Point, including bike and pedestrian facilities. If sufficient funding becomes available, this section could easily be combined with either Section 2 or Section 4. As a stand-alone project, the cost estimate ranges from $87 million to $157 million.
4. **Petaluma River Bridge to East of San Pablo Bay NWR Headquarters:** This will be a causeway section that runs between an existing point of higher elevation (the Petaluma River Bridge on

the west) and a point east of the entrance to the San Pablo Bay NWR Headquarters (2100 Sears Point Road). This section was identified as a possible stand-alone construction project because it would be almost entirely on either a major bridge structure (over the Petaluma River) or causeway (remainder of section). The western limits would tie into the at-grade portions of Section 3 and the eastern limits would conclude where the causeway ties into the rising surface elevation east of the San Pablo Bay NWR Headquarters access. Because of the challenges of transitioning from a causeway to the existing ground surface, the PEL Study Team believes that a causeway for the full length of the lower elevated portion of the corridor would be best as a single construction project. The cost estimate for Section 4 ranges from $972 million to $1.7 billion.

5. **NWR Headquarters to SR 37/SR 121 Interchange (Sears Point):** Section 5 is anticipated to be a long stretch of at-grade roadway with portions on embankment connecting on the west to the causeway of Section 4 and on the east to the existing low ridge (about 100 feet above sea level) immediately west of the SR 37/SR 121 intersection. Although the functional benefit of this section as a stand-alone project would not be as useful as other sections, this portion of the corridor was identified as a possible construction project that could also (and likely will) be combined with either Section 4 or Section 6, depending on needs and timing of those sections. As a stand-alone project, the cost estimate ranges from $75 million to $134 million.

6. **SR 37/SR 121 Interchange (Sears Point):** Section 6 is a critical piece that must not only connect to the new embankment stretch to the west but also to the proposed new causeway to the east (Segment 7). Similar to Section 1, this project would be an interchange project to improve traffic operations between SR 37 and SR 121. Because of the high cost associated with a major interchange such as this, it was identified as a possible stand-alone improvement. Section 6 must provide connectivity to SR 121 to the north and also raise the roadway elevation sufficiently so that the section immediately east (Section 7) can clear the existing railroad tracks (owned by SMART). However, if sufficient funding were to become available, Section 6 could also be combined with Section 5 or Section 7, and/or if the eastern limits were expanded to cross the SMART tracks and/or Tolay Creek. The cost estimate for Section 6 ranges from $67 million to $120 million; it would be higher if the project were to extend east over the railroad tracks and/or Tolay Creek.

7. **SR 37/SR 121 Interchange (Sears Point) to Walnut Avenue, Mare Island:** Section 7 would be a long stretch of causeway, running east from the SR 37/SR 121 interchange to the Walnut Avenue interchange. This interchange is where the existing SR 37 transitions from at grade to the Napa River Bridge. Similar to Section 4, this section was identified as a possible stand-alone construction project because it would be almost entirely on either bridge structures (over Tolay Creek and Sonoma Creek) or causeway (remainder of section). The western limits would tie into the elevation of the interchange but also sufficiently address sea level rise and railroad clearance limits. The eastern limits would tie into the existing interchange at Walnut Avenue or may require the reconstruction of the Walnut Avenue interchange. Because of the challenges of transitioning from a causeway to the existing ground surface, the PEL Study Team believes that a causeway (with accompanying bridge structures) for the

full length of the lower elevated portion of the corridor would be best as a single construction project. Improvements to the Walnut Avenue Interchange can also be made as part of Section 8 versus Section 7 if funding becomes available and access needs to Mare Island take priority. The cost estimate for Section 7 ranges from $2.9 billion to $5.2 billion.

8. **SR 37/Walnut Avenue Interchange at Mare Island to I-80:** At the Walnut Avenue interchange, the proposed causeway to the west would connect with the existing higher-elevation Napa River Bridge. Approaching the SR 29 intersection, existing SR 37 rises to existing structures with a lane configuration similar to the preferred alternative. As SR 37 approaches I-80, its elevation is greater than 100 feet above sea level and adaptation to sea level rise is not as important; therefore, portions of the existing SR 37 roadway can be incorporated/adapted into the preferred alternative and its typical section with less effort and cost. Improvements on this section would also need to consider reconstructing the interchanges along this portion of the corridor, including possibly the Walnut Avenue Interchange. Because of the high cost of these interchanges, it is possible that Section 8 can also be broken down to smaller projects focused on one interchange at a time. Not only would these projects address operational issues, but they would also build out SR 37 to the typical section and elevation envisioned for the preferred alternative to address sea level rise. The cost estimate for Section 8 ranges from $1.4 billion to $2.5 billion.

8.4 RECOMMENDATIONS FOR NEXT STEPS

As this SR 37 PEL Study concludes, it is notable for its success in building broad consensus around the selection of a preferred alternative for the SR 37 corridor. The end of the PEL, however, is only the beginning of project implementation. The wealth of information generated by the SR 37 PEL Study, along with the agency and stakeholder relationships enhanced through the course of the study, will help Caltrans and its transportation authority partners in next steps, which include the following:

Move Forward with Project Design: The preferred alternative design used in the SR 37 PEL Study needs to be further refined as a series of viable, smaller, individual projects. In particular, the independent utility and logical termini of each individual project will need to be further established and confirmed. It will be critical to demonstrate that each project can stand on its own in delivering benefits while also dovetailing with adjacent projects.

Determine Priority: Caltrans would be the lead agency under NEPA and CEQA and the agency responsible for constructing, maintaining, and operating any combination of smaller projects and, collectively, the entire corridor. Caltrans, working in collaboration with its partners on the Resilient SR 37 Team, must determine which one (or possibly more than one) of the smaller projects (individually or collectively) would be optimal to move forward first, taking financial, feasibility, and numerous other factors into account. Key factors in setting priorities include considerations of transportation equity, addressing the most acute current flooding concerns,

creating resiliency to sea level rise, ensuring public access, providing ecological enhancements, and potentially other factors.[15]

Assemble and Secure Funding: As previously noted, before Caltrans can sign off on an environmental document, it must demonstrate that it has appropriate funding in place. Section 8.5, *Potential Funding Sources*, identifies some funding sources potentially suitable to help Caltrans and its project partners secure adequate financial resources.

Potential funding opportunities may be focused on support for transit, freight, or highway improvements. Tolling is another potential funding source.

Ensure Consistency with Planning Documents: As the steps above are completed, Caltrans will continue its coordination with SR 37 PEL Study partners like MTC and the four county transportation authorities to ensure that relevant planning tools and documents (such as *Plan Bay Area 2050*, the regional transportation plan) accurately reflect future plans for the corridor.

8.5 POTENTIAL FUNDING SOURCES

Historically, large transportation projects often require funding through several reliable sources, such as formula-based programs, combined with other less predictable and variable sources such as federal and state discretionary grants. The cost of fully implementing the preferred alternative will require contributions from numerous federal, state, and local sources. On a project of this scale, local support is especially important because it helps make funding applications competitive when program grantees compare them with other projects competing for the same funding. Preservation of ROW, joint improvements, and collaborative mitigation efforts are valuable forms of local support that can also reduce costs and minimize resource impacts. As part of the SR 37 PEL Study, Caltrans developed a list of possible funding sources in collaboration with various stakeholders.

Potential funding opportunities may be focused on support for transit, freight, or highway improvements. Tolling is another potential funding source. Additionally, environmental considerations that influence funding needs to include mitigation and restoration costs, improved access to natural resources, and protection of critical habitat and open space, such as critical habitats identified by USFWS for threatened and endangered species, fish passage barrier status, regional Priority Conservation Areas, wetlands, and potential Section 4(f) (i.e., public park, wildlife refuge) lands. Funding opportunities come and go, and each has program goals, criteria, and restrictions that must be met.

Table 8-1 lists some potential viable federal, state, regional, and innovative funding sources, including some provided by PEL Study Team partners. The table includes links to more information as available. Pools of potential sources include programs administered by FHWA (the

[15] The Flood Reduction Project (item 2 on Figure 8-2)

Federal-Aid Highway Program), the Federal Transit Administration (for any associated public transit elements), a variety of State of California programs, and a number of innovative sources, some blending federal, state, and private sources. Caltrans, in coordination with its transportation authority partners for the SR 37 effort, will investigate potential funding opportunities in parallel with advancing design and establishing priority of projects.

Table 8-1. Prospective Funding Sources

Federal Aid Highway Programs	
Highway Safety Improvement Program (HSIP)	Congestion Mitigation and Air Quality Improvement Program (CMAQ)
Metropolitan Planning Program	National Highway Performance Program (NHPP)
Surface Transportation Block Grant Program (STBGP) 2021 Bipartisan Infrastructure Law Update	Recreational Trails Program
Consolidated Rail Infrastructure and Safety Improvements Program	Nationally Significant Federal Lands and Tribal Projects (NSFLTP) Program:
Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Discretionary Grant Program	National Highway Freight Program (NHFP)
2021 Bipartisan Infrastructure Law – Grant Programs Notices of Funding Opportunity Other Discretionary Funding	Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program
Multimodal Project Discretionary Grant Opportunity (MPDG)—Mega Grants, INFRA Grants	Congestion Relief Program
Federal Transit Programs	
Section 5303, 5304, 5305 Metropolitan and Statewide and non-Metropolitan Transportation Planning Program	Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities
Section 5307 Urbanized Area Formula Program	Section 5312 Public Transportation Innovation
Section 5309 Capital Investment Program	Section 5339 Buses and Bus Facilities Program
Transit-Oriented Development Planning Pilot	
State Programs	
Caltrans Sustainable Transportation Planning Grant Program	Transportation Development Act
Sustainable Transportation Planning Grants	Transit and Intercity Rail Capital Program (TIRCP)
State Transportation Improvement Program (STIP)	Low Carbon Transit Operations Program (LCTOP)
Active Transportation Program	State Airport Improvement Program Matching Grant

Innovative Financing	
Grant Anticipation Revenue Vehicles (GARVEE) Bond Program	Transportation Finance Bank (TFB) Loan Program
Public-Private Partnerships (PPP)	Transportation Infrastructure Finance and Innovation Act (TIFIA) of 1998
State Highway Account (SHA) Loan Program	Partnership Ventures administered the Caltrans private toll road program authorized by Streets and Highways Code Section 143 (Assembly Bill 680 Baker) (Chapter 107, Statutes of 1989)

8.6 SCHEDULE MILESTONES

In collaboration with many project partners, Caltrans prepared the SR 37 PEL Study over an approximately two-year period.

Caltrans began the PEL Study in late 2020. Early activities included engagement of the SWG, whose kickoff meeting was in December 2020, and a public kickoff meeting in June 2021. Working through the SWG, the project purpose and need were finalized in October 2021. That same month, Caltrans kicked off the three TWGs. With input from all working groups, the initial range of alternatives was finalized in January 2022. In turn, Level 1 screening of alternatives was finalized in March 2022; Level 2 screening in June 2022, and Level 3 screening (including confirmation of the preferred alternative) in August/September 2022.

Following the December 2022 publication of this SR 37 PEL Study, Caltrans expects to begin the PA&ED phase in 2023. Which section(s) of the SR 37 corridor will move forward into construction first and the exact timing construction would begin are contingent on funding availability. To ensure that funding and other contingencies are appropriately tracked and managed, Caltrans has started a Risk Register for the SR 37 project (Appendix N, *Risk Register*) that will be updated periodically throughout PA&ED and project implementation phases.

Figure 8-3. PEL Study Schedule Milestones

CHAPTER 9

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9.1 CHAPTER 1, INTRODUCTION

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9.2 CHAPTER 2, AGENCY, STAKEHOLDER, AND PUBLIC ENGAGEMENT

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9.3 CHAPTER 3, VISION, PURPOSE, AND NEED

None.

9.4 CHAPTER 4, EXISTING CONDITIONS

None.

9.5 CHAPTER 5, ALTERNATIVES IDENTIFICATION

None.

9.6 CHAPTER 6, ALTERNATIVES EVALUATION CRITERIA

None.

9.7 CHAPTER 7, ALTERNATIVES SCREENING AND IDENTIFICATION OF THE PREFERRED ALTERNATIVE

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9.8 CHAPTER 8, IMPLEMENTATION PLAN

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